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Mouriz et al.

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(54) **METHOD FOR COVERING ROOF WITH SHRINK WRAP**

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E04D 5/06	(2006.01)
E04D 15/04	(2006.01)

(52) **U.S. Cl.**
CPC ***E04D 5/146*** (2013.01); ***E04D 5/06*** (2013.01); ***E04D 5/142*** (2013.01); ***E04D 15/04*** (2013.01); *E04D 2015/042* (2013.01)

(58) **Field of Classification Search**
CPC E04D 5/146; E04D 5/142; E04D 15/04; E04D 5/06; E04D 2015/042
See application file for complete search history.

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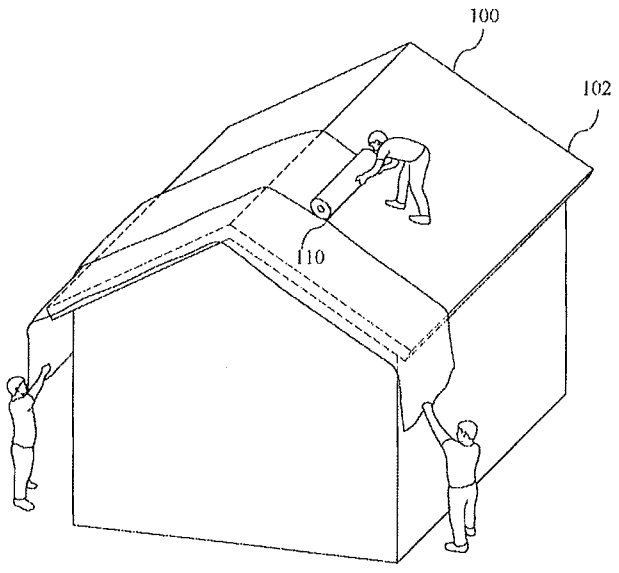
(57) **ABSTRACT**

A system and method for temporary protection of a damaged roof is provided. The method includes draping a strip of an impermeable membrane over the roof, wherein the end of the strip overhangs the eaves of the roof, placing a rigid, elongated piece of construction material under the end of the strip that overhangs the eaves of the roof, such that the construction material is placed below the eaves of the roof, cutting the end of the strip such that it is coextensive with a length of the construction material and cutting the end of the strip below the construction material, fastening the construction material to the end of the strip, rolling the construction material at least one full turn in the end of the strip, attaching the construction material to the eaves of the roof, and repeating the steps above until the roof is covered in the impermeable membrane.

9 Claims, 7 Drawing Sheets



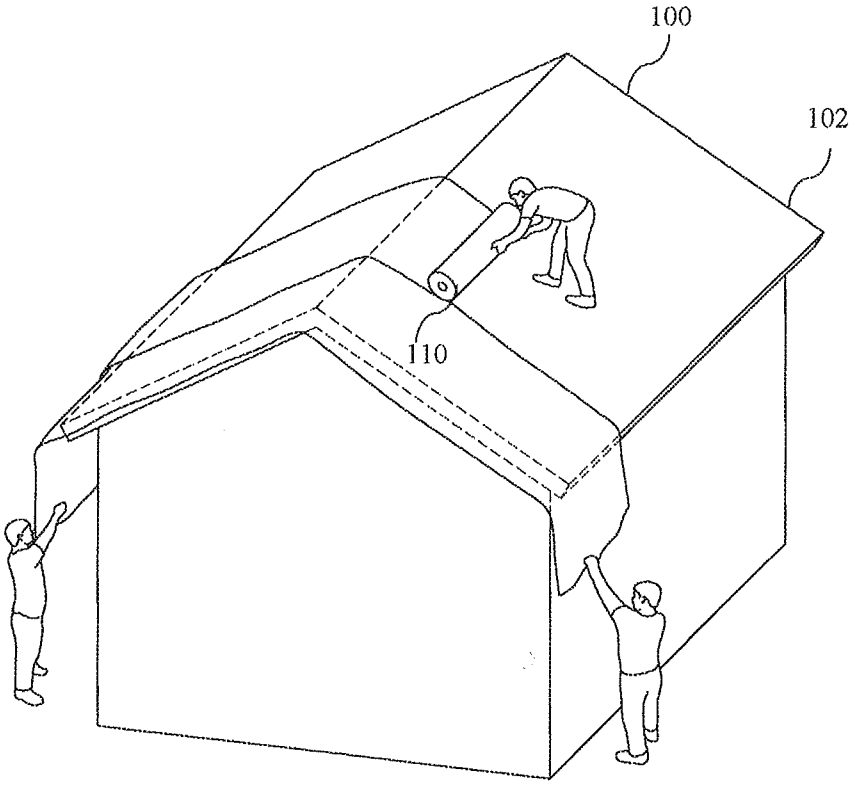


Fig. 1

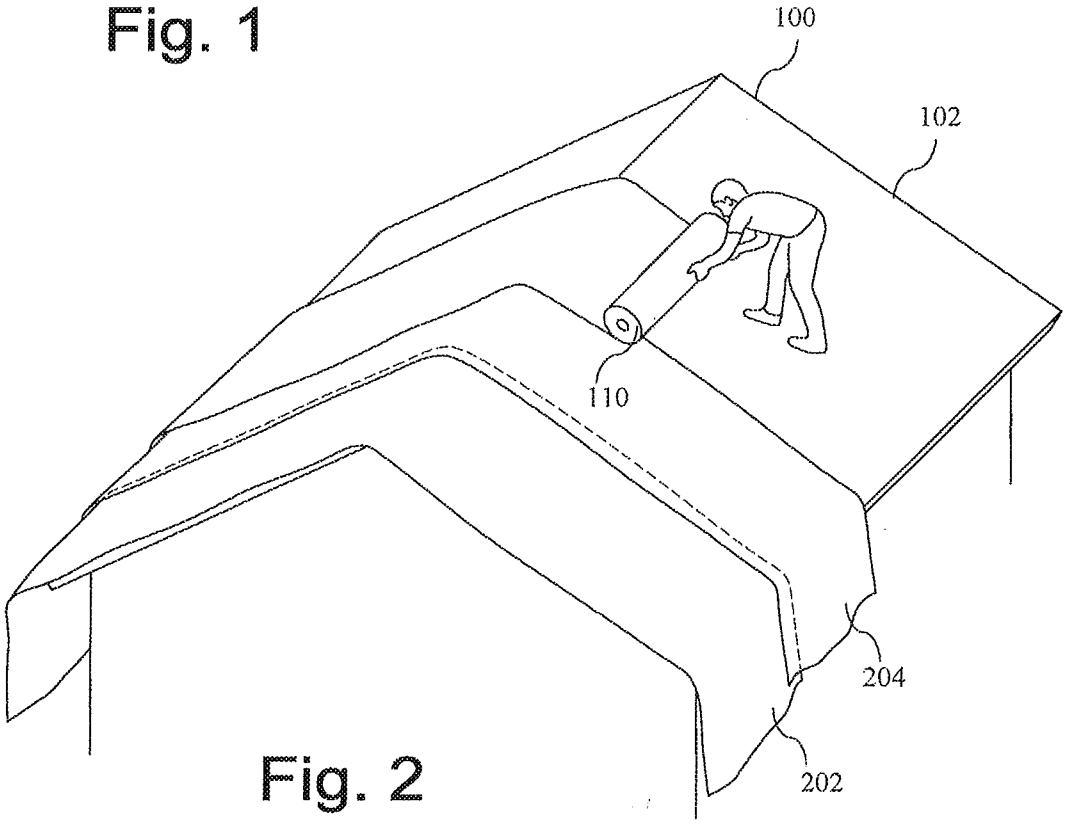


Fig. 2

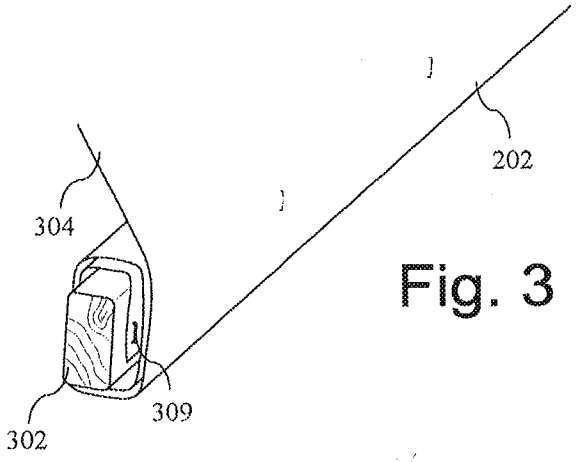


Fig. 3

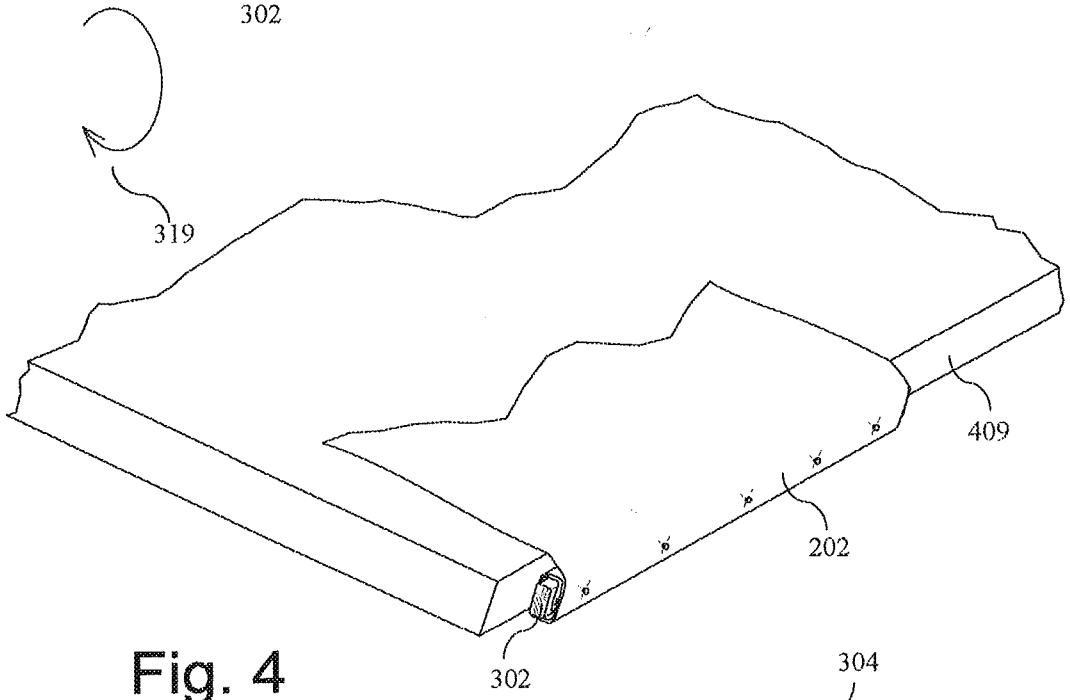


Fig. 4

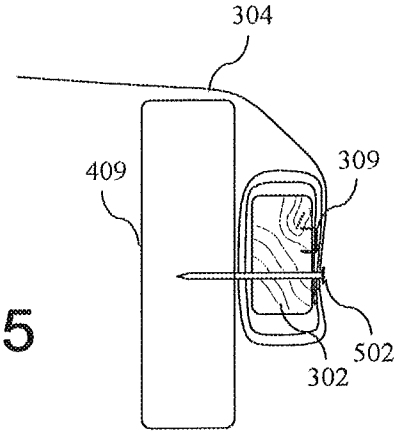


Fig. 5

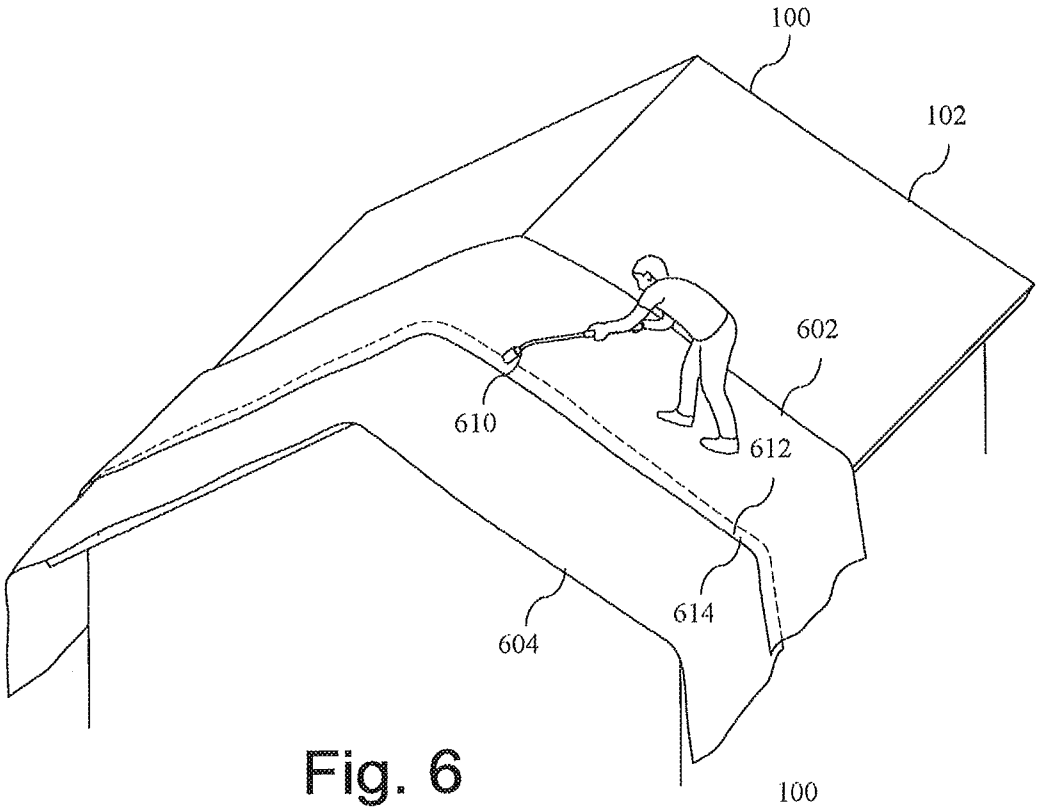


Fig. 6

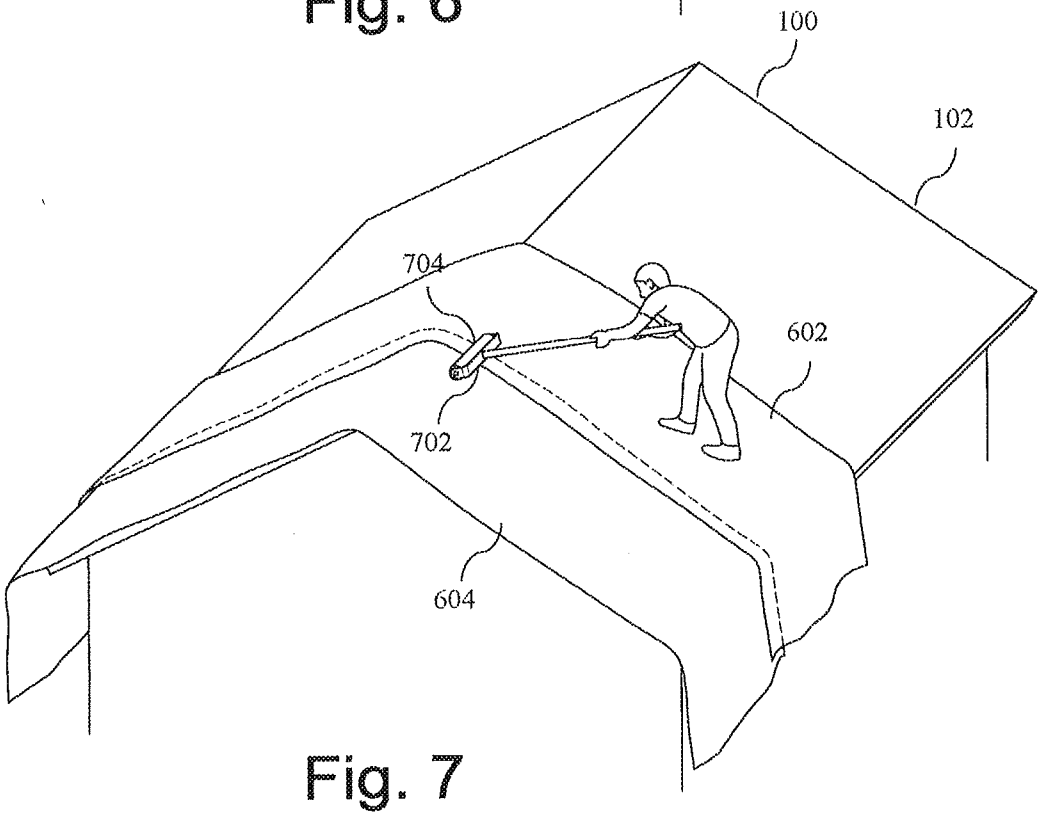


Fig. 7

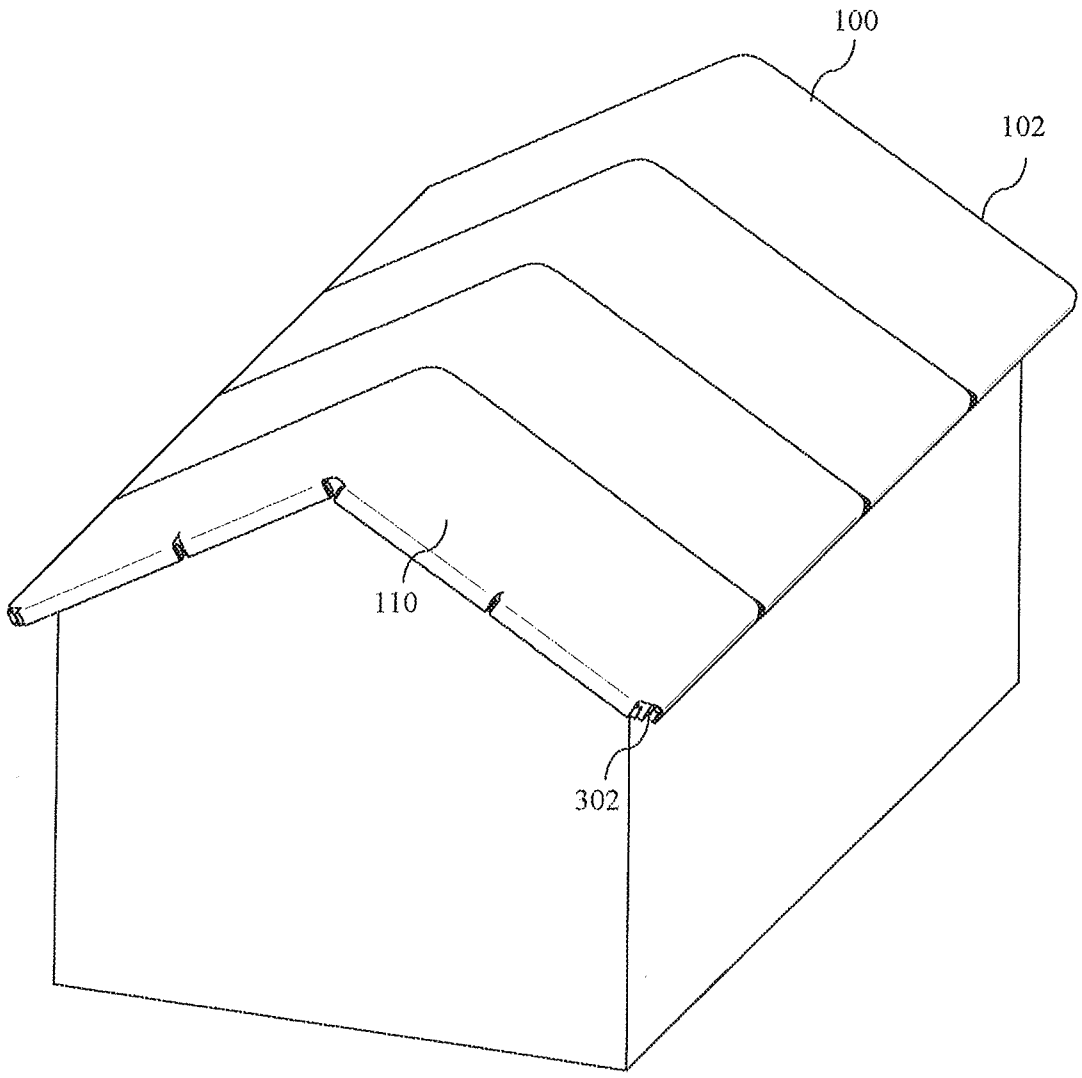


Fig. 8

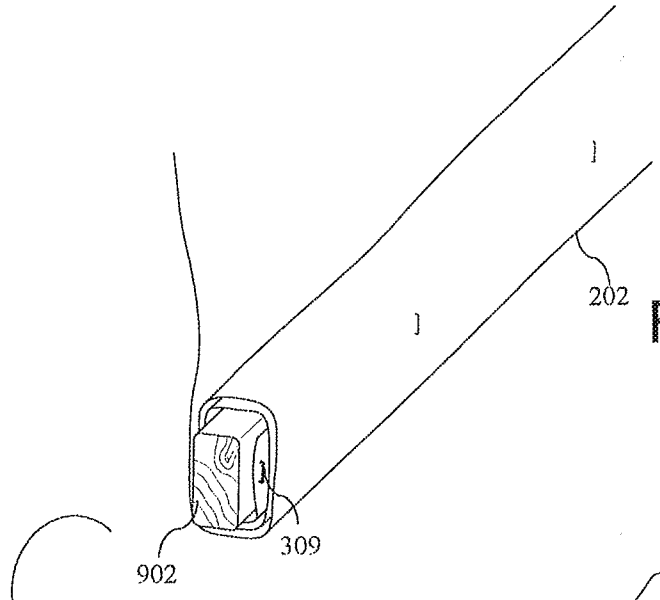


Fig. 9

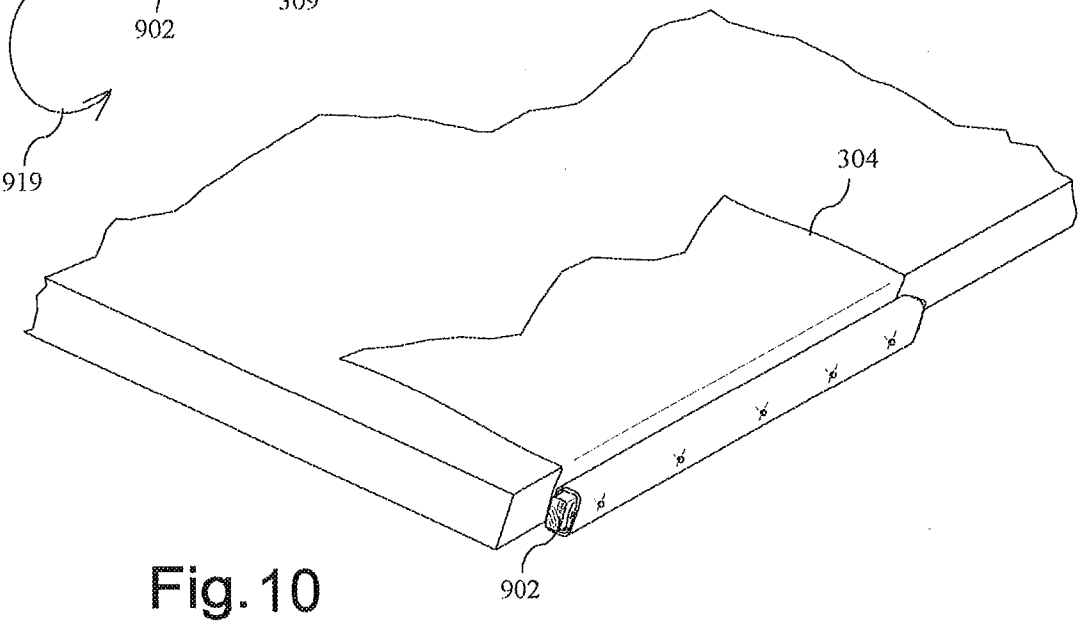


Fig. 10

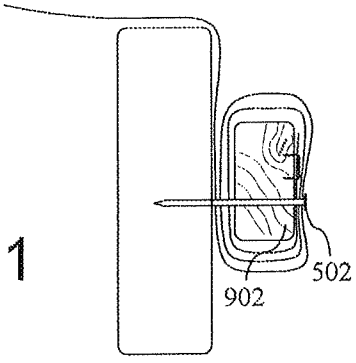


Fig. 11

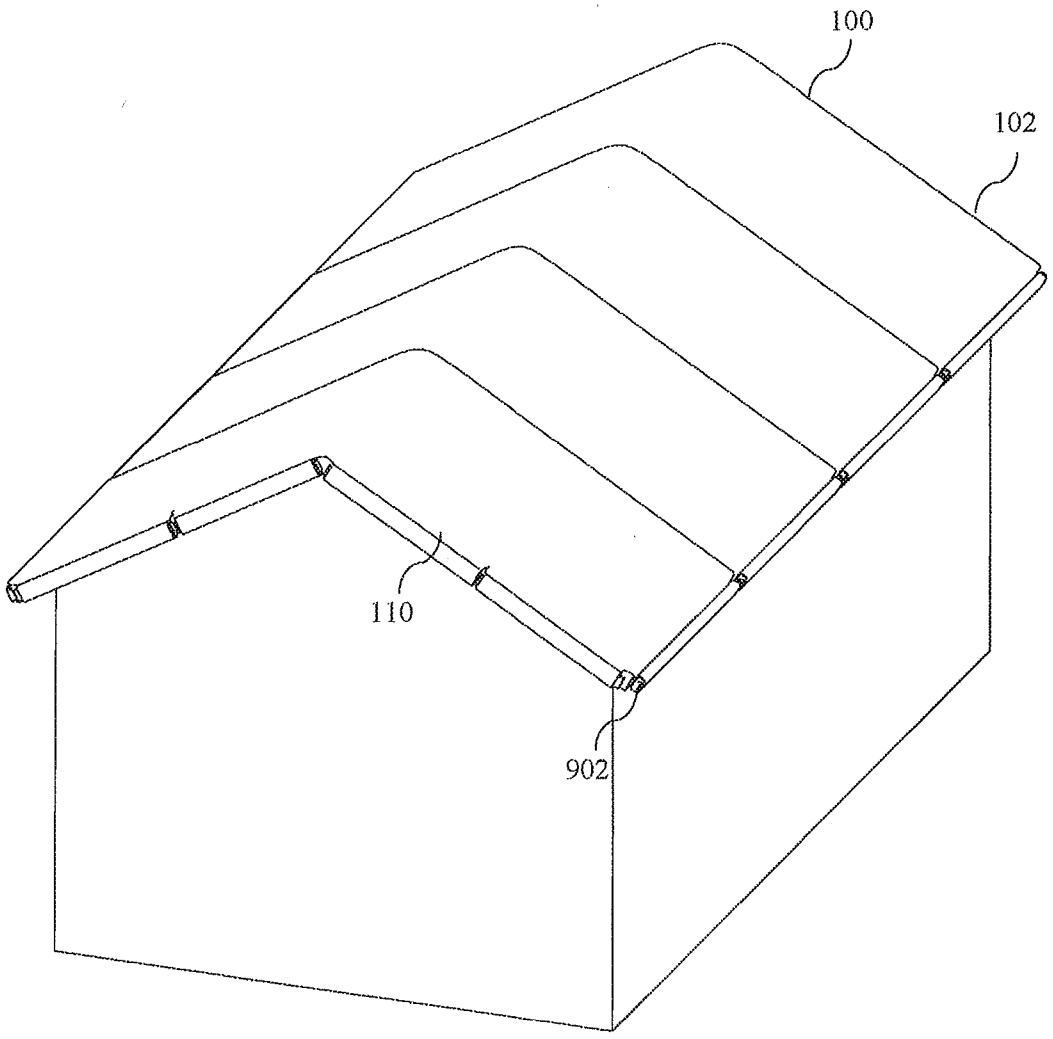


Fig. 12

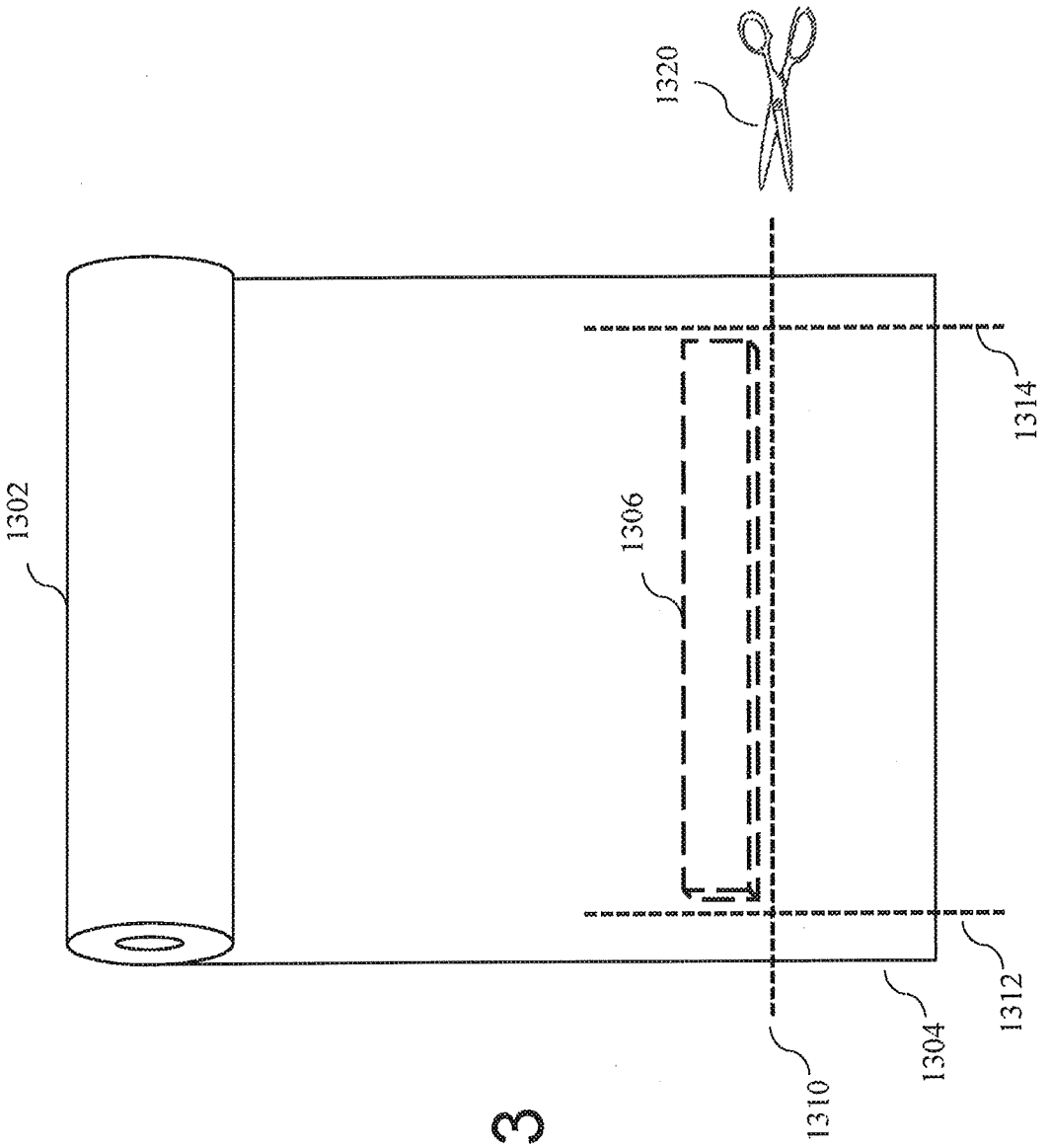


Fig. 13

METHOD FOR COVERING ROOF WITH SHRINK WRAP

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable.

INCORPORATION BY REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

Not Applicable.

TECHNICAL FIELD

The technical field relates generally to the field of residential and commercial structural maintenance and, more specifically, relates to the field of roof maintenance for residential and commercial structures.

BACKGROUND

Maintenance is the process of ensuring that buildings and structures retain a good appearance and operate at optimum efficiency. Inadequate maintenance can result in decay, degradation and reduced performance and can affect health and threaten the safety of users, occupants and others in the vicinity. Building structure, and roofs in particular, are regularly subjected to harsh conditions including wind, rain, snow, heat, cold, and storms. Said conditions can cause damage to the roof, as well as the interior of the structure. For these reasons, roofs require regular maintenance to maintain optimum efficiency and continue to accomplish their design goals.

When roofs suffer significant damage, however, significant construction or refurbishing services may be necessary. This may require a long period of time to accomplish, as contractors must be found and assigned to the job, permits must be obtained, and money must be allocated and transferred. During this period time, the roof cannot be left unattended, as the roof the contents of the structure may suffer further damage. In these situations, therefore, temporary remedial or protective measures are necessary.

Various approaches to this problem have been proposed. A well-known approach to this problem is to attach a temporary water-impermeable membrane to the exterior of the roof to prevent water from penetrating the roof while it remains damaged, also known as the blue tarp method. These approaches, however, are difficult and time-consuming to implement. The current approaches to the problem of applying a temporary membrane to a damaged roof do not address the issue of properly fitting the membrane to the roof size and shape. The current approaches also do not address the issue of fastening the ends or the perimeter of the membrane to the roof. Improper fitting of the membrane to the size and shape of the roof can result in a membrane that can be removed by strong winds or permit water to enter in between the membrane and the roof. Additionally, improper fastening of the ends, or perimeter of, the membrane, can result in a membrane that is too easily removed and allows water penetration. For these reasons, the current approaches to the problem of applying a temporary membrane to a damaged roof are inadequate.

Additionally, the current approaches to the problem of applying a temporary membrane to a damaged roof, including the blue tarp method, add holes to the top of the roof, which can cause further water leakage into the structure, and only last for up to 90 days. In fact, the Federal Emergency Management Agency, FEMA, even categorizes the blue tarp method as only a 30-day solution. Therefore, the current approaches to the problem of applying a temporary membrane to a damaged roof are temporary at best.

Therefore, a need exists to overcome the problems with the prior art as discussed above, and particularly for a more efficient way of applying temporary remedial or protective measures onto a damaged roof.

SUMMARY

A system and method for temporary protection of a damaged roof is provided. This Summary is provided to introduce a selection of disclosed concepts in a simplified form that are further described below in the Detailed Description including the drawings provided. This Summary is not intended to identify key features or essential features of the claimed subject matter. Nor is this Summary intended to be used to limit the claimed subject matter's scope.

In one embodiment, a system and method for temporary protection of a damaged roof is provided that solves the above-described problems. The method includes draping a strip of the impermeable membrane over the roof, wherein the end of the strip overhangs the eaves of the roof, placing a rigid, elongated piece of construction material under the end of the strip that overhangs the eaves of the roof, such that the construction material is placed below the eaves of the roof, cutting the end of the strip such that it is coextensive with a length of the construction material and cutting the end of the strip below the construction material, fastening the construction material to the end of the strip using a plurality of first fasteners, rolling the construction material at least three full turns in the end of the strip that overhangs the eaves of the roof, attaching the construction material that was rolled in the end of the strip to the eaves of the roof using a plurality of second fasteners, and repeating the steps above until the entire roof is covered in the impermeable membrane.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. In the drawings:

FIG. **1** is an illustration of a perspective view of a residential structure with a damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **2** is an illustration of a close-up perspective view of the residential structure with the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **3** is an illustration showing construction material in the process of being wrapped in the impermeable membrane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **4** is an illustration showing construction material completely wrapped in the impermeable membrane and

attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **5** is an illustration showing a cross-sectional view of construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **6** is an illustration showing two strips of the impermeable membrane being fastened together using heat, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **7** is an illustration showing two strips of the impermeable membrane being fastened together using a roller device, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **8** is an illustration of a perspective view of the residential structure with a damaged roof, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment.

FIG. **9** is another illustration showing construction material in the process of being wrapped in the impermeable membrane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **10** is another illustration showing construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **11** is another illustration showing a cross-sectional view of construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **12** is another illustration of a perspective view of the residential structure with a damaged roof, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment.

FIG. **13** is an illustration showing how an end of the strip of membrane is cut, according to an example embodiment.

DETAILED DESCRIPTION

The following detailed description refers to the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the following description to refer to the same or similar elements. While embodiments of the claimed subject matter may be described, modifications, adaptations, and other implementations are possible. For example, substitutions, additions, or modifications may be made to the elements illustrated in the drawings, and the methods described herein may be modified by substituting, reordering, or adding stages to the disclosed methods. Accordingly, the following detailed description does not limit the claimed subject matter. Instead, the proper scope of the claimed subject matter is defined by the appended claims.

The claimed subject matter improves over the prior art by providing an economic, user-friendly and effective way of temporarily protecting a damaged roof, and the contents of the structure, from further damage. The claimed subject matter is further easy to learn for workers and time-saving to implement. The claimed subject matter further improves over the prior art by properly fitting the membrane to the roof size and shape and properly fastening the ends or the perimeter of the membrane to the roof. Proper fitting of the membrane to the size and shape of the roof results in a membrane that cannot be removed by strong winds or permit water to enter in between the membrane and the roof. Additionally, proper fastening of the ends, or perimeter of, the membrane, results in a membrane that is not easily removed and does not allow water penetration. Furthermore, the claimed subject matter does not introduce additional holes into the damaged roof and is a more than a temporary solution, as it can persist for periods of time longer than 90 days.

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. The claimed system and method for temporary protection of a damaged roof will now be described with respect to FIGS. **1** through **8**. FIG. **1** is an illustration of a perspective view of a residential structure **100** with a damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **1** shows that the proposed system and method includes the application of an impermeable membrane to the damaged roof.

The proposed system utilizes a water impermeable membrane that may shrink when heat is applied. Namely, when heat is applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. The water impermeable membrane may be used in a variety of thicknesses, clarities, strengths and shrink ratios. The water impermeable membrane may comprise polyolefin and may be a material made up of polymer plastic film. Polyolefin is a type of polymer produced from a simple olefin (also called an alkene) as a monomer. Other examples of materials used for the water impermeable membrane include PVC, polyethylene, polypropylene, EP/EVA/copolyester/EVA/EP (where EP is ethylene-propylene and EVA is ethylene-vinyl acetate copolymer) and other compositions.

The water impermeable membrane may be provided in rolls **110** of a certain width. In one embodiment, each roll **110** of the water impermeable membrane comprises a width of about 24 to 42 inches, with each roll provided from about 40 feet to about 120 feet of length of the water impermeable membrane. FIG. **1** shows that several rolls **110** of the impermeable membrane have been placed on top of the damaged roof **102** of the residential structure **100**. Each roll **110** is unrolled on top of the damaged roof **102** in the same direction and the sides of each unrolled strip of impermeable membrane are placed adjacent to another unrolled strip of impermeable membrane, such that the sides of each unrolled strip are coupled with the sides of the unrolled strips adjacent, as described more fully below.

FIG. **2** is an illustration of a close-up perspective view of the residential structure **100** with the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **2** shows multiple rolls **110** of the impermeable

membrane have been placed on top of the damaged roof **102** of the residential structure **100** in order to protect said roof, and the contents of the residential structure **100**, from further damage or decay from precipitation, wind, etc. FIG. **2** shows that each roll **110** is unrolled, either fully or partially, on top of the damaged roof **102** in the same direction. FIG. **2** also shows that the sides of each unrolled strip **202** of impermeable membrane are placed adjacent to another unrolled strip **204** of impermeable membrane. More specifically, FIG. **2** shows that the sides of each unrolled strip **202** of impermeable membrane are placed so as to overlap (by about 3 to 8 inches) with the sides of the adjacent unrolled strip **204** of impermeable membrane. Subsequently, the sides of each unrolled strip are coupled with the sides of the unrolled strips adjacent, as described more fully below.

FIG. **3** is an illustration showing construction material **302** in the process of being wrapped in the impermeable membrane **304**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. In FIG. **3**, the construction material **302** is a piece of lumber, which is a type of wood that has been processed into beams and planks. A plank, i.e., a wood plank or plank of wood, is timber that is flat, elongated, and rectangular with parallel faces that are higher and longer than wide. Planks are usually more than 1½ in (38 mm) thick and are generally wider than 2½ in (64 mm). Planks can be any length and are generally a minimum of 2 in (51 mm) deep by 8 in (200 mm) wide, but planks that are 2 in (51 mm) by 10 in (250 mm) and 2 in (51 mm) by 12 in (300 mm) are more common. In one embodiment, the construction material **302** is a wood plank that measures 2 in×4 in, 2 in×6 in, 2 in×8 in, or 2 in×12 in.

In other embodiments, the construction material **302** may be other items, such as portions of metal siding, portions of roof tile, etc. FIG. **3** shows the roll **110** of impermeable membrane has been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves of the damaged roof **102** of the residential structure. FIG. **3** shows that the end of the unrolled strip **202** (which was rolled around the construction material **302**) has been attached to the construction material **302** via one or more fasteners **309**, which is a staple. Other types of fasteners may be used to attach the construction material **302** to the end of the unrolled strip **202**, such as nails, clips, screws, etc. Also, adhesive may be used to attach the construction material **302** to the end of the unrolled strip **202**. FIG. **3** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202** in a clockwise **319** direction so that the open end of the roll faces downwards.

FIG. **4** is an illustration showing construction material **302** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **4** shows the roll **110** of impermeable membrane had been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves **409** of the damaged roof **102**, so as to be applied to the construction material **302**. FIG. **4** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **409** of the damaged roof **302**.

FIG. **5** is an illustration showing a cross-sectional view of construction material **302** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **5** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **409** of the damaged roof **102**. The construction material **302** may be wrapped such that the end of the unrolled strip **302** completely surrounds the construction material 1 time, 2 times, or 3-4 times. I.e., in one embodiment, construction material **302** is wrapped 1 time, 2 times, or 3-4 times in the end of the unrolled strip. FIG. **5** shows that the end of the unrolled strip **202** (after wrapping the construction material **302**) has been attached to the construction material **302** via a fastener **309**, which is a staple. FIG. **5** further shows that the construction material **302** and the end of the unrolled strip **202** (which wraps around the construction material **302**) has been attached to the eaves **409** of the roof via one or more fasteners **502**, which is a nail. Other types of fasteners may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof, such as clips, screws, etc. Also, adhesive may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof.

In one embodiment, the method or process of attaching the ends of the unrolled strip **202** to the eaves of the damaged roof **102** occurs as follows. A first unrolled strip of the impermeable membrane is draped over the roof **102**, wherein the end of the strip overhangs the eaves of the roof. Then, a wood plank is placed horizontally under the end of the strip that overhangs the eaves of the roof, such that the wood plank is placed below the eaves of the roof. The wood plank is placed far enough below the eaves of the roof such that when the wood plank is rolled up in the end of the strip (described below), the wood plank is at the height of the eaves of the roof. Next, the left and right sides of the strip are cut vertically such that the strip is coextensive with a length of the wood plank. The end of the strip is also cut horizontally below the wood plank. That is, assuming the wood plank is placed horizontally so that it is parallel with the eaves of the roof, a vertical cut in placed in the end of the strip on the left of the wood plank, a vertical cut in placed in the end of the strip on the right of the wood plank, and a horizontal cut is placed in the end of the strip below the wood plank.

Subsequently, the wood plank is fastened to the end of the strip using a plurality of staples. Next, the wood plank is rolled at least one, two or three full turns in the end of the strip, such that the wood plank is at a height of the eaves of the roof. Then, the wood plank that was rolled in the end of the strip is attached to the eaves of the roof using a plurality of nails. Further, each strip of the impermeable membrane that has been draped over the roof is placed such that it overlaps at least three inches with each adjacent strip of the impermeable membrane that has been draped over the roof. The steps above are repeated until the entire roof is covered in the impermeable membrane. Finally, heat is applied using a heat source to a portion of each strip that overlaps an adjacent strip, so as to meld the portion of each strip with the adjacent strip (as described more fully below). Also, heat may be applied using a heat source to all or a portion of the impermeable membrane on the roof, so as to shrink the membrane for aerodynamic purposes (to reduce or eliminate the membrane blowing off in a wind) and for hydrodynamic purposes to aid in water running or falling off the roof.

FIG. **6** is an illustration showing two strips **602**, **604** of the impermeable membrane being fastened together using heat, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. Recall that the water impermeable membrane that may shrink when heat is applied. Namely, when heat is

applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. FIG. **6** shows that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane are placed such that that the sides of each strip overlap (by about 3 to 8 inches) with the sides of the adjacent strip of impermeable membrane. Subsequently, heat is applied to the overlapping portion of the sides of each strip using a blowtorch or other heat device **610**. As a result, the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane are melded together, thereby producing a seam that is also water impermeable.

FIG. **7** is an illustration showing two strips **602**, **604** of the impermeable membrane being fastened together using a roller device **702**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **7** shows that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane were placed such that that the sides of each strip overlap and heat was applied to the overlapping portion so that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane were melded together, thereby producing a seam that is also water impermeable. FIG. **7** shows that a roller **702** is applied to the overlapping portion or seam so as to secure the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane together. The roller **702** may comprise a leather cylinder **704** that rotates as it rolls over the overlapping portion, thereby patting down any bubbles or undulations in the overlapping portion. The purpose of applying the roller **702** is to flatten the overlapping portion or seam as much as possible, resulting in a stronger seam and a flatter surface that optimizes water runoff.

FIG. **8** is an illustration of a perspective view of the residential structure **100** with a damaged roof **102**, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment. FIG. **8** shows that multiple rolls **110** of the impermeable membrane have been draped on top of the damaged roof **102** of the residential structure **100** in the same direction and the sides of each unrolled strip of impermeable membrane have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof is covered in the impermeable membrane. Finally, sandbags may be placed on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof. FIG. **8** shows that the construction material **302** on the eaves of the roof has been wrapped in the end of the unrolled strip **202** in a clockwise direction so that the open end of the roll faces downwards. This reduces or eliminates the pooling of water in the open end of the roll.

FIG. **9** is another illustration showing construction material **902** in the process of being wrapped in the impermeable membrane **304**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. In FIG. **9**, the construction material **902** is rolled in the end of the unrolled strip **202** in a counterclockwise direction **919** so that an open end of the roll faces upwards. FIG. **9** shows the roll **110** of impermeable membrane has been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves of the damaged roof **102** of the residential structure. FIG. **9** shows that the end of the unrolled strip **202** (which was rolled around the construction material **902**) has been attached to the construction material **902** via a fastener **309**, which is a staple.

FIG. **10** is an illustration showing construction material **902** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **10** shows that the construction material **902** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves of the damaged roof **102**.

FIG. **11** is an illustration showing a cross-sectional view of construction material **902** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **11** shows that the construction material **902** has been wrapped in the end of the unrolled strip **202** in a counterclockwise direction so that the open end of the roll faces upwards. The construction material **902** may be wrapped such that the end of the unrolled strip **202** completely surrounds the construction material 1-time, 2-times or, alternatively, 3-4 times. I.e., in one embodiment, construction material **902** is wrapped 1-time, 2-times or, alternatively, 3-4 times in the end of the unrolled strip. FIG. **11** shows that the end of the unrolled strip **202** (after wrapping the construction material **902**) has been attached to the construction material **902** via a nail **502**.

FIG. **12** is another illustration of a perspective view of the residential structure **100** with a damaged roof **102**, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment. FIG. **12** shows that multiple rolls **110** of the impermeable membrane have been draped on top of the damaged roof **102** of the residential structure **100** in the same direction and the sides of each unrolled strip of impermeable membrane have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof is covered in the impermeable membrane. FIG. **12** shows that the construction material **902** on the eaves of the roof has been wrapped in the end of the unrolled strip **202** in a counterclockwise direction so that the open end of the roll faces upwards.

FIG. **13** is an illustration showing how an end of the strip of membrane is cut, according to an example embodiment. In one embodiment, the method or process of attaching the ends of the unrolled strip **1304** to the eaves of the damaged roof **102** occurs as follows. A first unrolled strip **1304** of the impermeable membrane **1302** is draped over the roof **102**, wherein the end of the strip overhangs the eaves of the roof. Then, a wood plank **1306** is placed horizontally under the end of the strip **1304** that overhangs the eaves of the roof, such that the wood plank is placed below the eaves of the roof. The wood plank is placed far enough below the eaves of the roof such that when the wood plank is rolled up in the end of the strip, the wood plank is at the height of the eaves of the roof. Next, the right side of the strip **1304** is cut (using a cutting device, such as scissors **1320**) vertically along a line **1314** to substantially match the length of the wood plank **1306**. Also, the left side of the strip **1304** is cut vertically along a line **1312** to substantially match the length of the wood plank **1306**. Next, the end of the strip **1304** is cut horizontally along a line **1310** below the wood plank **1306**. Then, the wood plank is rolled in the strip **1304** as described

above. Subsequently, the wood plank is fastened to the end of the strip using a plurality of staples. Next, the wood plank is rolled at least one, two or three full turns in the end of the strip, such that the wood plank is at a height of the eaves of the roof. Then, the wood plank that was rolled in the end of the strip is attached to the eaves of the roof using a plurality of nails.

Embodiments may be described above with reference to functions or acts, which comprise methods. The functions/acts noted above may occur out of the order as shown or described. For example, two functions/acts shown or described in succession may in fact be executed substantially concurrently or the functions/acts may sometimes be executed in the reverse order, depending upon the functionality/acts involved. While certain embodiments have been described, other embodiments may exist. Further, the disclosed methods' functions/acts may be modified in any manner, including by reordering functions/acts and/or inserting or deleting functions/acts, without departing from the spirit of the claimed subject matter.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A method for covering a roof with an impermeable membrane, comprising:

a) draping a strip of the impermeable membrane over the roof, wherein an end of the strip overhangs a vertical, outward-facing fascia of the eaves of the roof, and wherein the strip has a specified width;

b) placing a rigid, elongated piece of construction material in a horizontal position under the end of the strip that overhangs the vertical, outward-facing fascia of the eaves of the roof, such that the construction material is placed below the vertical, outward-facing fascia of the eaves of the roof, wherein the construction material is a plank having a length less than the width of the strip;

c) cutting the end of the strip such as follows: 1) a horizontal cut below a position of the construction material, 2) a vertical cut to the left of the construction material, and 3) a vertical cut to the right of the construction material, such that the resulting shape of the end of the strip is substantially commensurate with the construction material;

d) fastening the construction material to the end of the strip using a plurality of staples;

e) rolling the construction material at least two full turns in the end of the strip, such that the construction material is at a height of the vertical, outward-facing facia of the eaves of the roof;

f) attaching the construction material that was rolled in the end of the strip to the vertical, outward-facing fascia of the eaves of the roof using a plurality of nails or screws; and

g) repeating steps a) through f) until the entire roof is covered in the impermeable membrane.

2. The method of claim 1, further comprising:

h) overlapping at least three inches of a first strip of the impermeable membrane that has been draped over the roof with a second strip of the impermeable membrane that has been draped over the roof.

3. The method of claim 2, further comprising:

i) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to the entire impermeable membrane, so as to shrink the entire impermeable membrane.

4. The method of claim 3, further comprising:

j) placing sandbags on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof.

5. The method of claim 4, wherein the rigid, elongated piece of construction material comprises a wood plank.

6. A method for covering a roof with an impermeable membrane, comprising:

a) draping a strip of the impermeable membrane over the roof, wherein an end of the strip overhangs a vertical, outward-facing fascia of the eaves of the roof, and wherein the strip has a specified width;

b) placing a wood plank in a horizontal position under the end of the strip that overhangs the vertical, outward-facing fascia of the eaves of the roof, such that the wood plank is placed below the vertical, outward-facing fascia of the eaves of the roof, wherein the wood plank has a length less than the width of the strip;

c) cutting the end of the strip such as follows: 1) a horizontal cut below a position of the wood plank, 2) a vertical cut to the left of the wood plank, and 3) a vertical cut to the right of the wood plank, such that the resulting shape of the end of the strip is substantially commensurate with the wood plank;

d) fastening the wood plank to the end of the strip using a plurality of staples;

e) rolling the wood plank at least three full turns in the end of the strip, such that the wood plank is at a height of the vertical, outward-facing fascia of the eaves of the roof;

f) attaching the wood plank that was rolled in the end of the strip to the vertical, outward-facing fascia of the eaves of the roof using a plurality of second fasteners; and

g) repeating steps a) through f) until the entire roof is covered in the impermeable membrane.

7. The method of claim 6, further comprising:

h) overlapping at least three inches of a first strip of the impermeable membrane that has been draped over the roof with a second strip of the impermeable membrane that has been draped over the roof.

8. The method of claim 7, further comprising:

i) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip.

9. The method of claim 8, further comprising:

j) placing sandbags on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof.

* * * * *

US010683666B1

(12) **United States Patent**
Mouriz et al.

(10) **Patent No.: US 10,683,666 B1**
(45) **Date of Patent: *Jun. 16, 2020**

(54) **METHOD FOR COVERING ROOF WITH SHRINK WRAP**

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(73) Assignee: **STRUCTURAL WRAP, LLC**, Miami, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/681,421**

(22) Filed: **Nov. 12, 2019**

Related U.S. Application Data

(63) Continuation-in-part of application No. 16/294,554, filed on Mar. 6, 2019, now Pat. No. 10,472,827.

(51) **Int. Cl.**
E04D 5/06 (2006.01)
E04D 5/14 (2006.01)

(52) **U.S. Cl.**
CPC ***E04D 5/06*** (2013.01); ***E04D 5/144*** (2013.01)

(58) **Field of Classification Search**
CPC E04D 5/146; E04D 5/142; E04D 15/04; E04D 5/06; E04D 2015/042
See application file for complete search history.

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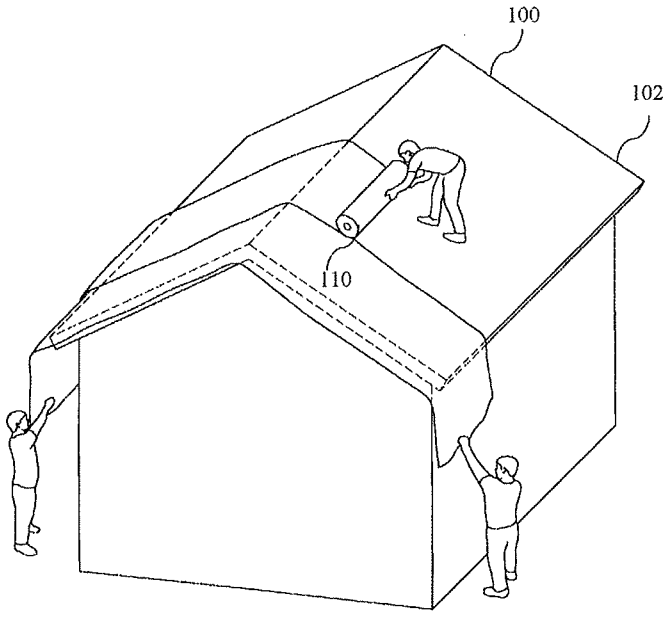
Primary Examiner — Patrick J Maestri
(74) *Attorney, Agent, or Firm* — Mark Terry

(57) **ABSTRACT**

A system and method for temporary protection of a damaged roof is provided. The method includes draping a strip of the impermeable membrane over the roof, wherein the end of the strip overhangs a fascia of eaves of the roof, placing a piece of construction material in a horizontal position under the end of the strip, cutting the end of the strip as follows: a horizontal cut and two vertical cuts of the construction material, such that a resulting shape of the end of the strip is substantially commensurate with the construction material, fastening the construction material to the end of the strip, rolling the construction material at least one full turn in the end of the strip, attaching the construction material to the fascia of the eaves of the roof, and repeating the steps above until the entire roof is covered in the impermeable membrane.

19 Claims, 7 Drawing Sheets



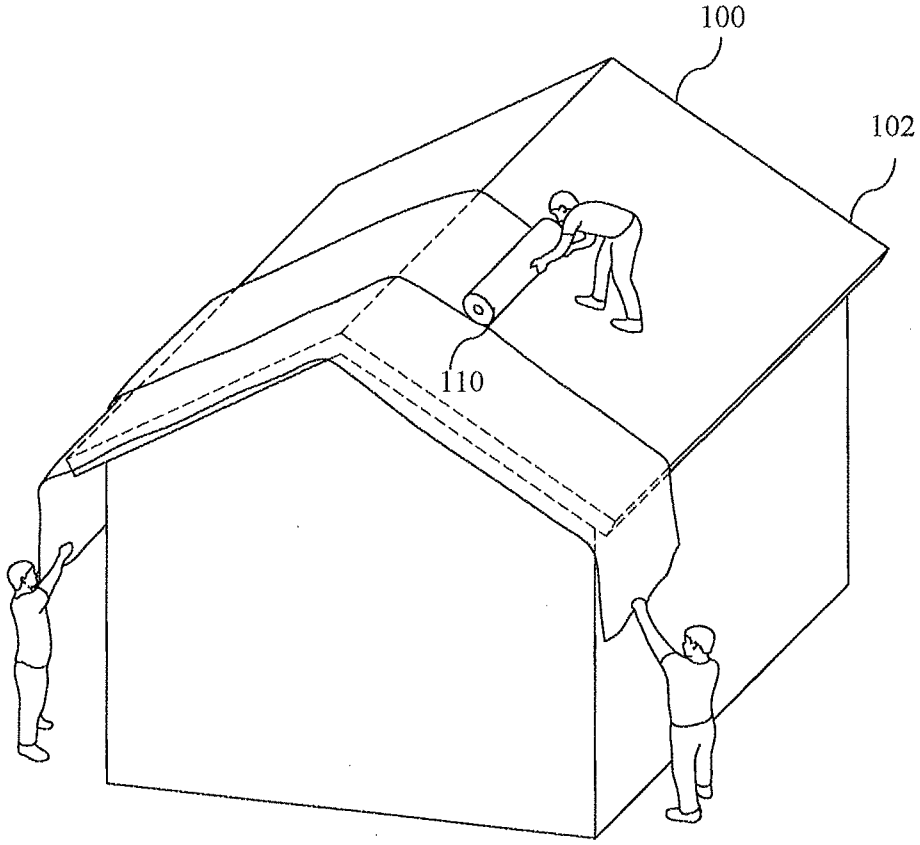


Fig. 1

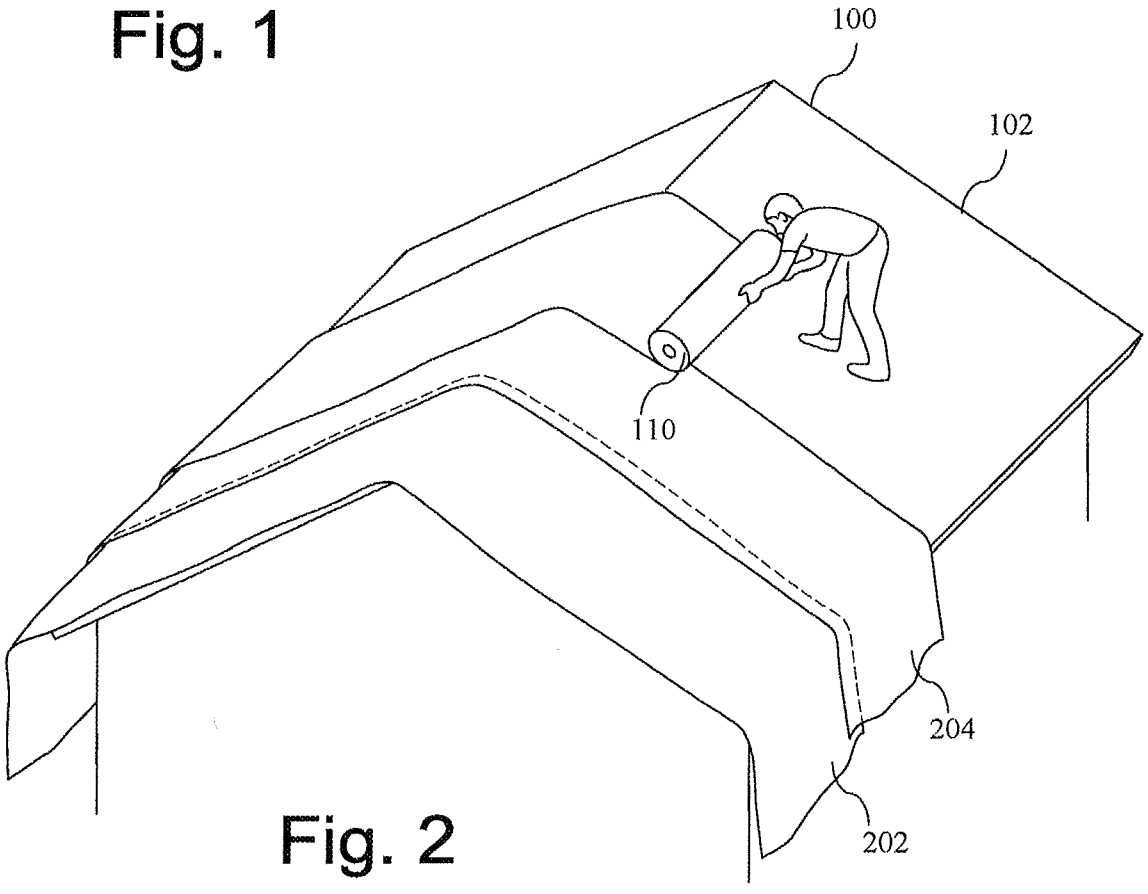


Fig. 2

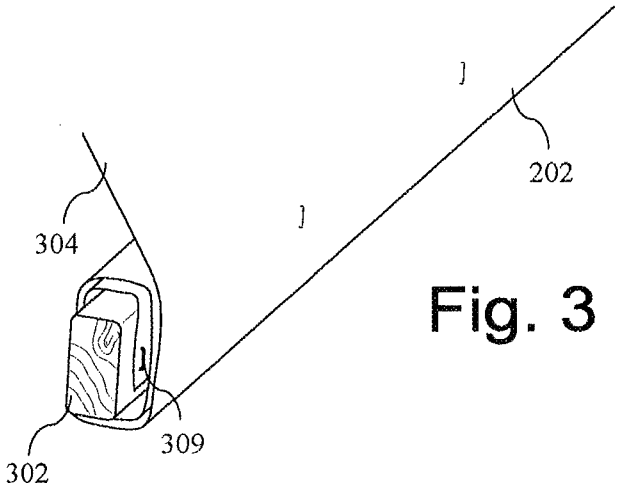


Fig. 3

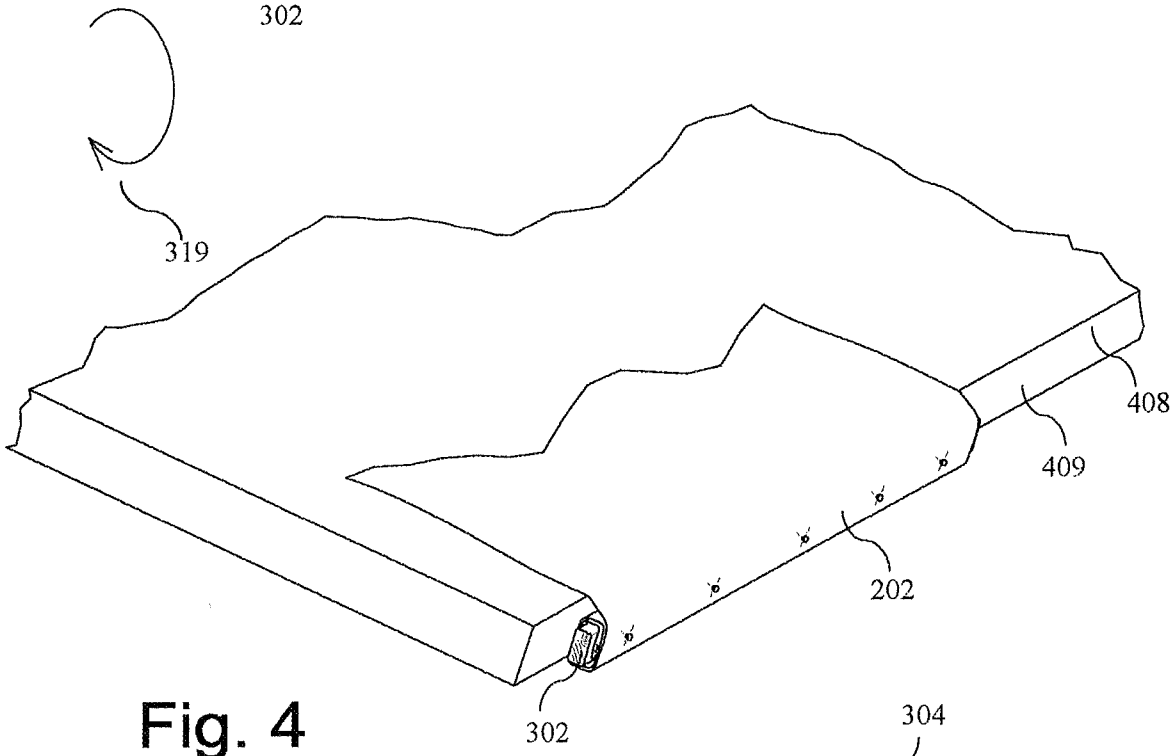


Fig. 4

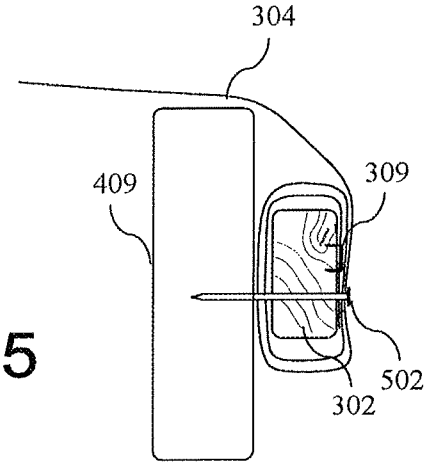


Fig. 5

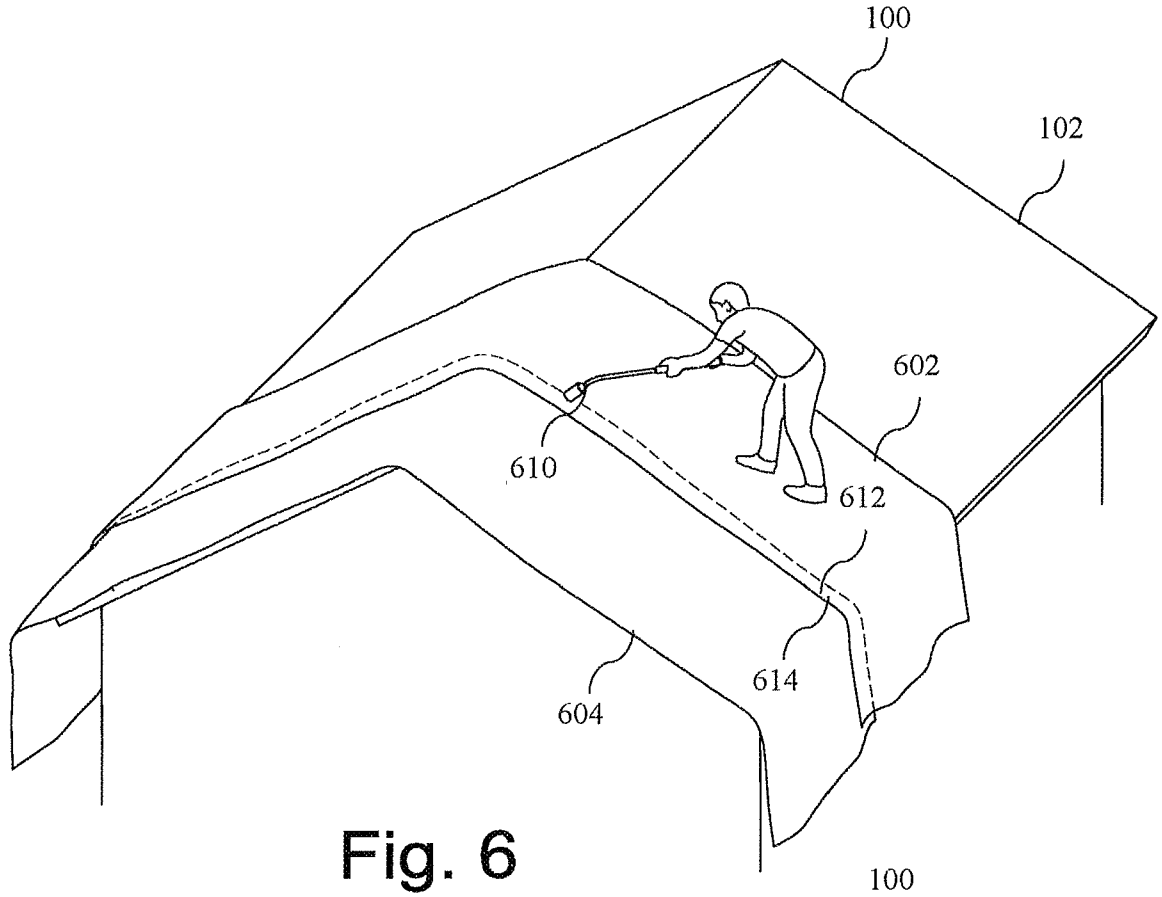


Fig. 6

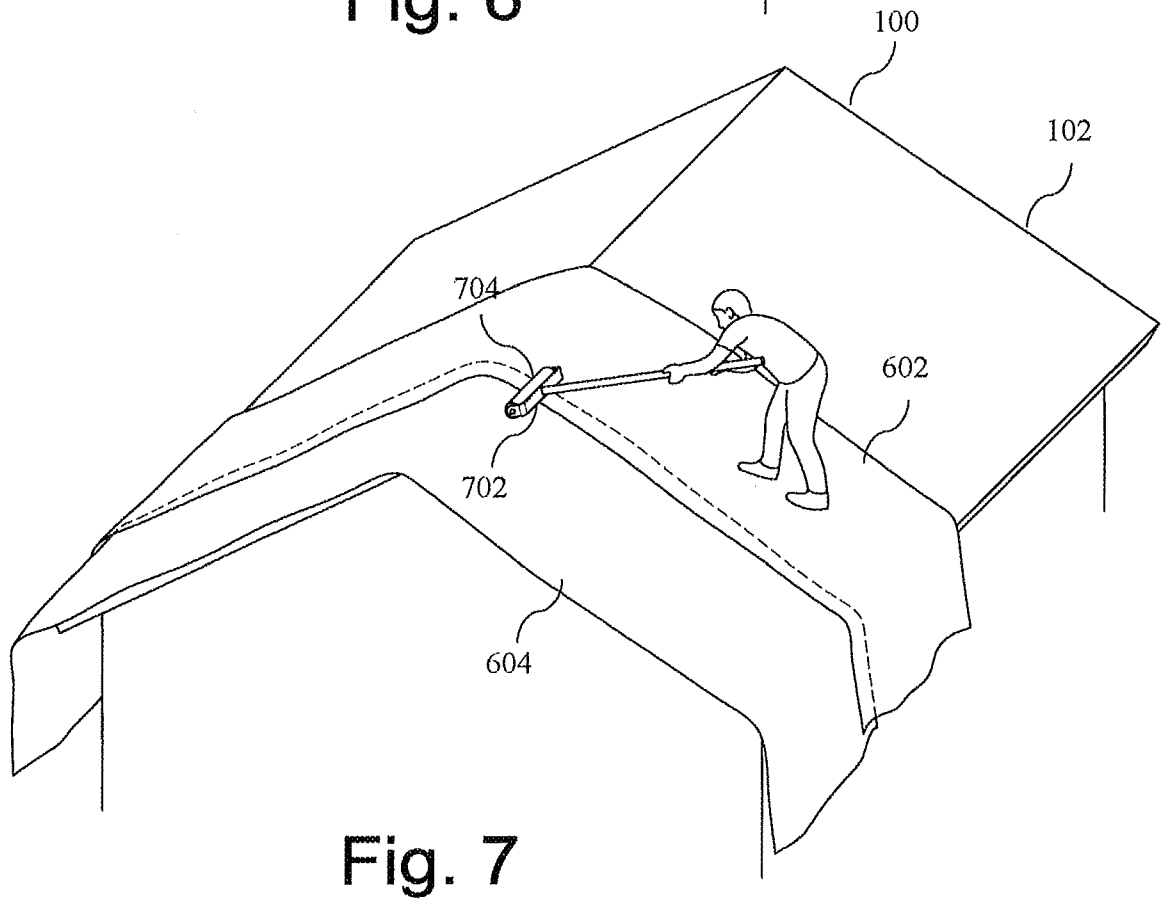


Fig. 7

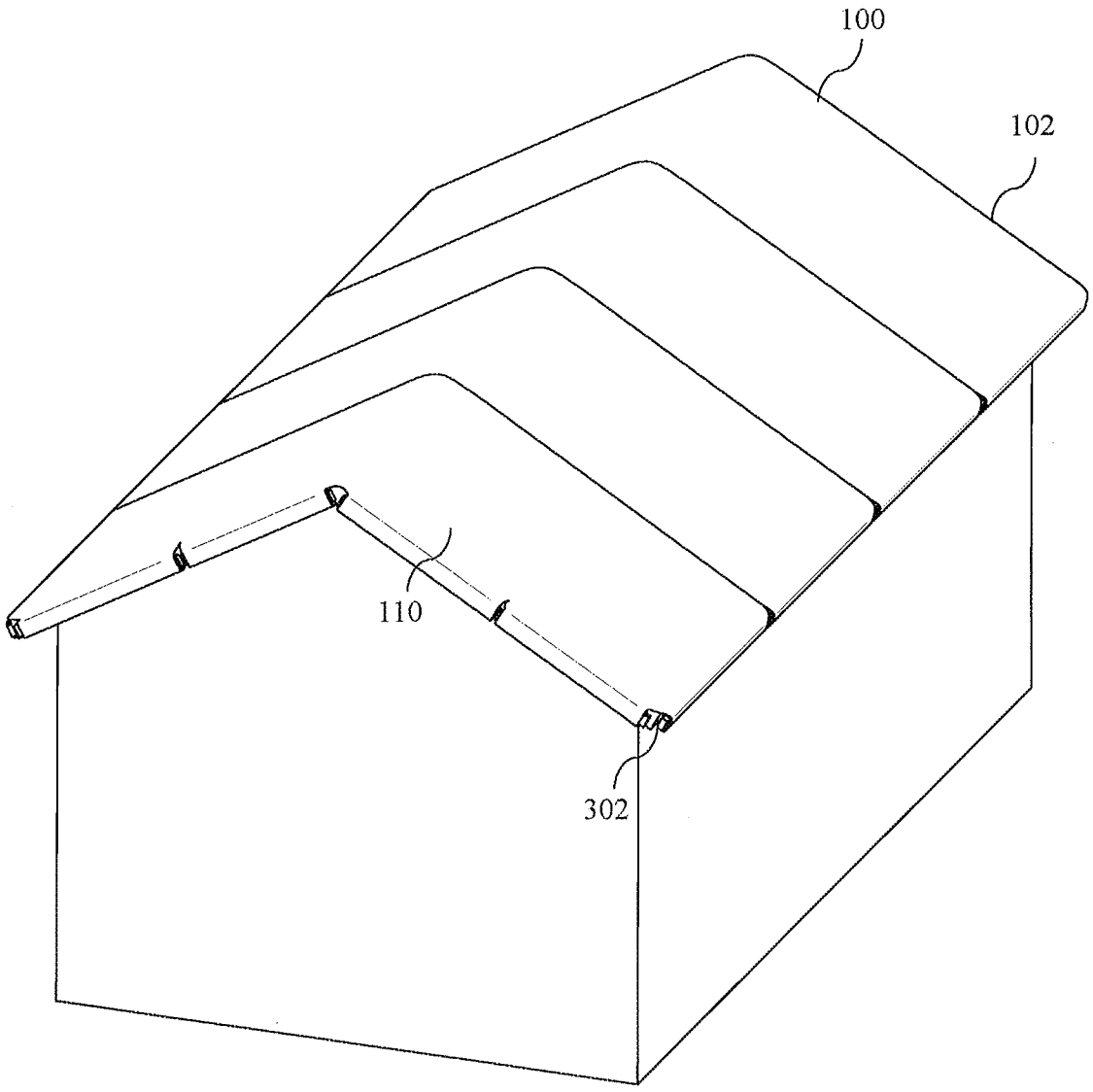


Fig. 8

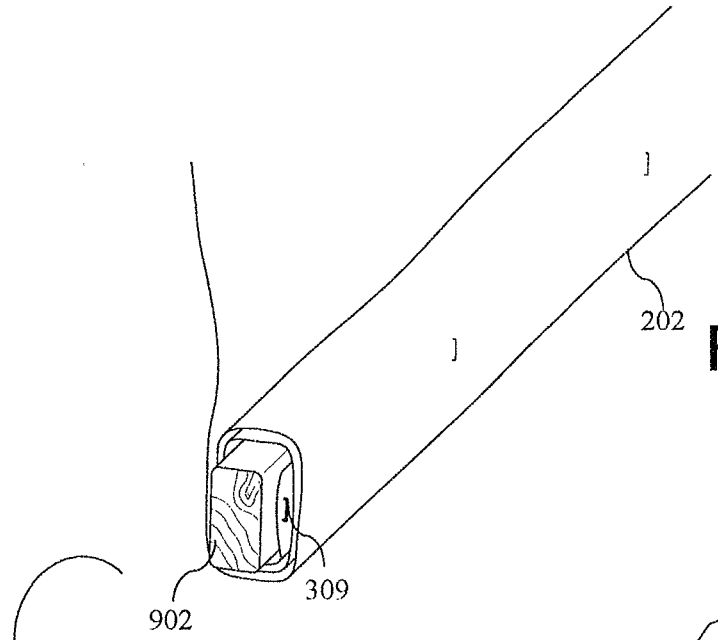


Fig. 9

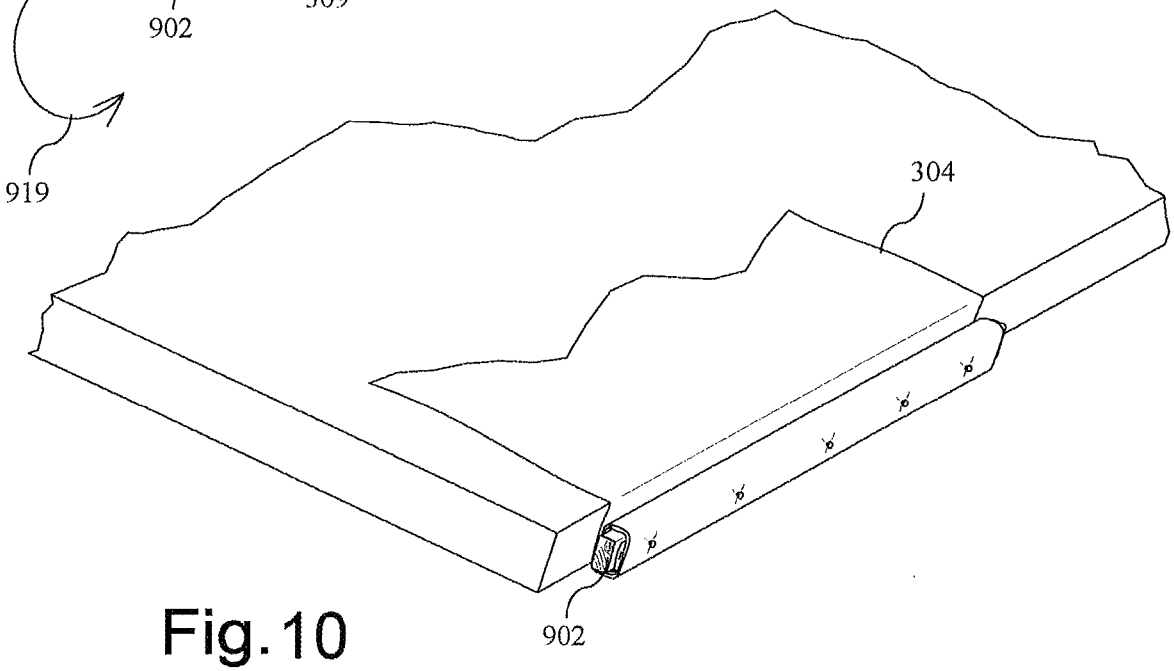


Fig. 10

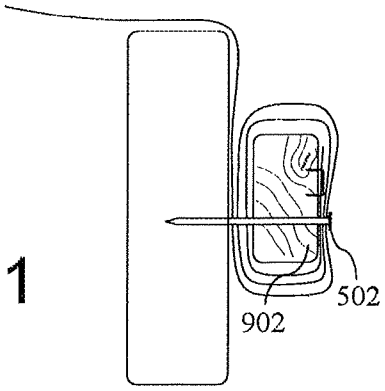


Fig. 11

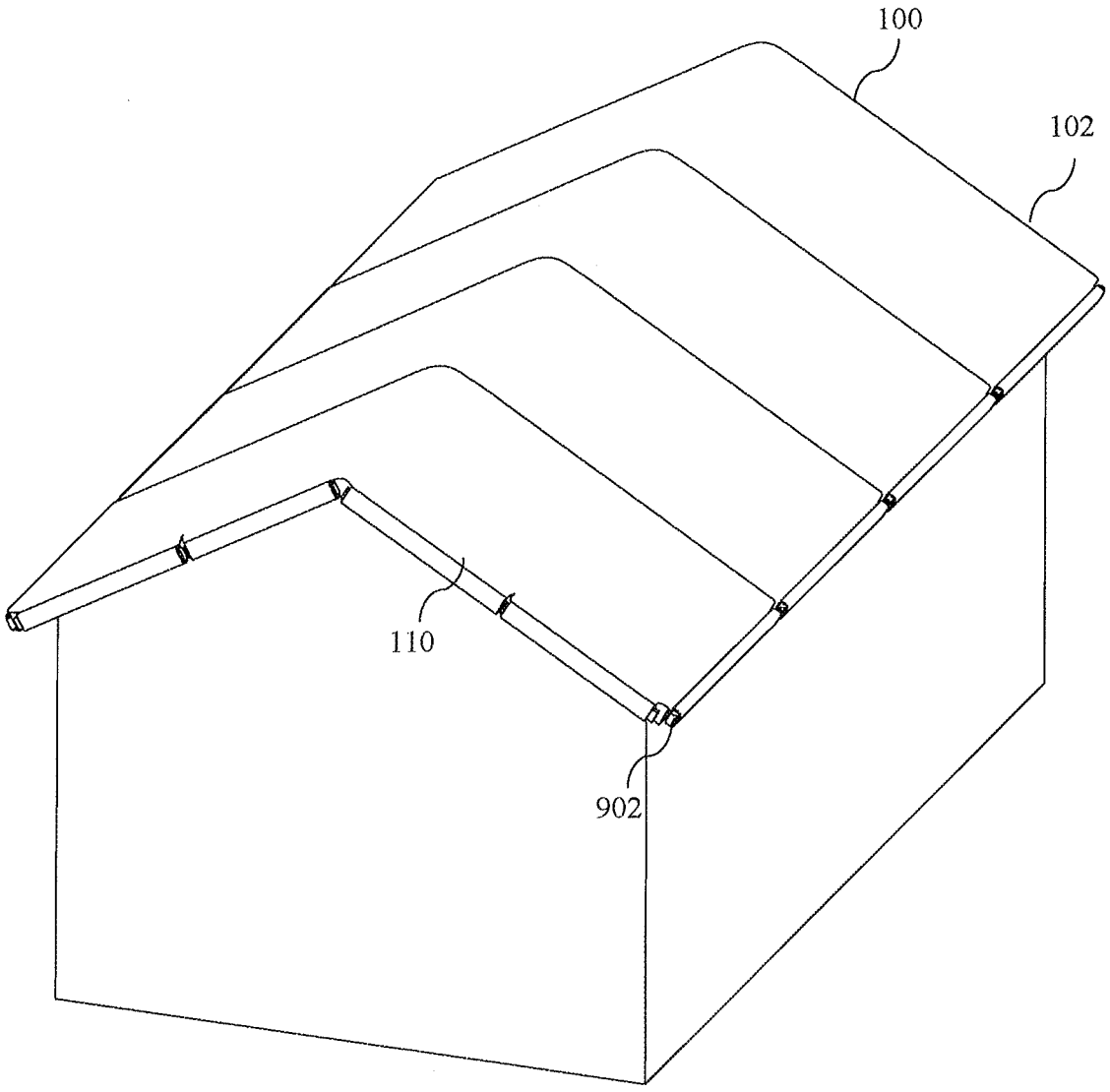


Fig. 12

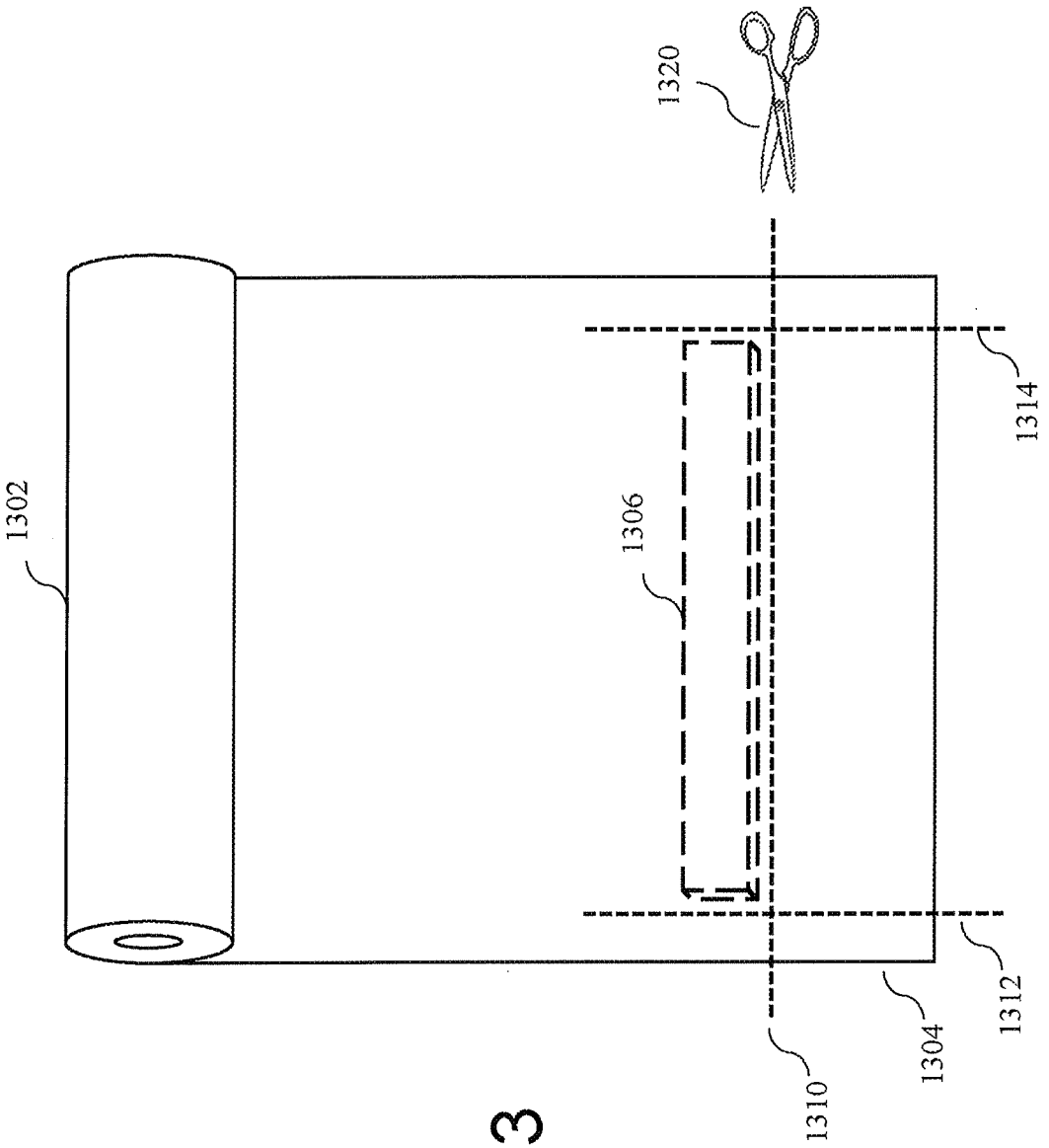


Fig. 13

METHOD FOR COVERING ROOF WITH SHRINK WRAP

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to, and is a continuation in part of, application Ser. No. 16/294,554 filed Mar. 6, 2019 and titled "Method for Covering Roof with Shrink Wrap." The subject matter of application Ser. No. 16/294,554 is hereby incorporated by reference in its entirety.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable.

INCORPORATION BY REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

Not Applicable.

TECHNICAL FIELD

The technical field relates generally to the field of residential and commercial structural maintenance and, more specifically, relates to the field of roof maintenance for residential and commercial structures.

BACKGROUND

Maintenance is the process of ensuring that buildings and structures retain a good appearance and operate at optimum efficiency. Inadequate maintenance can result in decay, degradation and reduced performance and can affect health and threaten the safety of users, occupants and others in the vicinity. Building structure, and roofs in particular, are regularly subjected to harsh conditions including wind, rain, snow, heat, cold, and storms. Said conditions can cause damage to the roof, as well as the interior of the structure. For these reasons, roofs require regular maintenance to maintain optimum efficiency and continue to accomplish their design goals.

When roofs suffer significant damage, however, significant construction or refurbishing services may be necessary. This may require a long period of time to accomplish, as contractors must be found and assigned to the job, permits must be obtained, and money must be allocated and transferred. During this period time, the roof cannot be left unattended, as the roof the contents of the structure may suffer further damage. In these situations, therefore, temporary remedial or protective measures are necessary.

Various approaches to this problem have been proposed. A well-known approach to this problem is to attach a temporary water-impermeable membrane to the exterior of the roof to prevent water from penetrating the roof while it remains damaged, also known as the blue tarp method. These approaches, however, are difficult and time-consuming to implement. The current approaches to the problem of applying a temporary membrane to a damaged roof do not address the issue of properly fitting the membrane to the roof size and shape. The current approaches also do not address the issue of fastening the ends or the perimeter of the membrane to the roof. Improper fitting of the membrane to the size and shape of the roof can result in a membrane that can be removed by strong winds or permit water to enter in between the membrane and the roof. Additionally, improper fastening of the ends, or perimeter of, the membrane, can result in a membrane that is too easily removed and allows water penetration. For these reasons, the current approaches to the problem of applying a temporary membrane to a damaged roof are inadequate.

Additionally, the current approaches to the problem of applying a temporary membrane to a damaged roof, including the blue tarp method, add holes to the top of the roof, which can cause further water leakage into the structure, and only last for up to 90 days. In fact, the Federal Emergency Management Agency, FEMA, even categorizes the blue tarp method as only a 30-day solution. Therefore, the current approaches to the problem of applying a temporary membrane to a damaged roof are temporary at best.

Therefore, a need exists to overcome the problems with the prior art as discussed above, and particularly for a more efficient way of applying temporary remedial or protective measures onto a damaged roof.

SUMMARY

A system and method for temporary protection of a damaged roof is provided. This Summary is provided to introduce a selection of disclosed concepts in a simplified form that are further described below in the Detailed Description including the drawings provided. This Summary is not intended to identify key features or essential features of the claimed subject matter. Nor is this Summary intended to be used to limit the claimed subject matter's scope.

In one embodiment, a system and method for temporary protection of a damaged roof is provided that solves the above-described problems. The method includes draping a strip of the impermeable membrane over the roof, wherein the end of the strip overhangs a fascia of eaves of the roof, placing a rigid, elongated piece of construction material in a horizontal position under the end of the strip that overhangs the fascia of the eaves of the roof, such that the construction material is placed below the fascia of the eaves of the roof, cutting the end of the strip as follows: 1) a horizontal cut below a position of the construction material, 2) a vertical cut to the left of the construction material, and 3) a vertical cut to the right of the construction material, such that a resulting shape of the end of the strip is substantially commensurate with the construction material, fastening the construction material to the end of the strip using a plurality of first fasteners, rolling the construction material at least one full turn in the end of the strip that overhangs the fascia of the eaves of the roof, attaching the construction material that was rolled in the end of the strip to the fascia of the eaves of the roof using a plurality of second fasteners, and repeating the steps above until the entire roof is covered in the impermeable membrane.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. In the drawings:

FIG. **1** is an illustration of a perspective view of a residential structure with a damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **2** is an illustration of a close-up perspective view of the residential structure with the damaged roof, as the

proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **3** is an illustration showing construction material in the process of being wrapped in the impermeable membrane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **4** is an illustration showing construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **5** is an illustration showing a cross-sectional view of construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **6** is an illustration showing two strips of the impermeable membrane being fastened together using heat, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **7** is an illustration showing two strips of the impermeable membrane being fastened together using a roller device, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **8** is an illustration of a perspective view of the residential structure with a damaged roof, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment.

FIG. **9** is another illustration showing construction material in the process of being wrapped in the impermeable membrane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **10** is another illustration showing construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **11** is another illustration showing a cross-sectional view of construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **12** is another illustration of a perspective view of the residential structure with a damaged roof, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment.

FIG. **13** is an illustration showing how an end of the strip of membrane is cut, according to an example embodiment.

DETAILED DESCRIPTION

The following detailed description refers to the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the following description to refer to the same or similar elements. While embodiments of the claimed subject matter may be described, modifications, adaptations, and other implementations are possible. For example, substitutions, additions, or modifications may be made to the elements illustrated in the drawings, and the methods described herein may be modified by substituting, reordering, or adding stages to the disclosed methods. Accordingly, the following detailed description does not limit the claimed subject matter. Instead, the proper scope of the claimed subject matter is defined by the appended claims.

The claimed subject matter improves over the prior art by providing an economic, user-friendly and effective way of temporarily protecting a damaged roof, and the contents of the structure, from further damage. The claimed subject matter is further easy to learn for workers and time-saving to implement. The claimed subject matter further improves over the prior art by properly fitting the membrane to the roof size and shape and properly fastening the ends or the perimeter of the membrane to the roof. Proper fitting of the membrane to the size and shape of the roof results in a membrane that cannot be removed by strong winds or permit water to enter in between the membrane and the roof. Additionally, proper fastening of the ends, or perimeter of, the membrane, results in a membrane that is not easily removed and does not allow water penetration. Furthermore, the claimed subject matter does not introduce additional holes into the damaged roof and is a more than a temporary solution, as it can persist for periods of time longer than 90 days.

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. The claimed system and method for temporary protection of a damaged roof will now be described with respect to FIGS. **1** through **8**. FIG. **1** is an illustration of a perspective view of a residential structure **100** with a damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **1** shows that the proposed system and method includes the application of an impermeable membrane to the damaged roof.

The proposed system utilizes a water impermeable membrane that may shrink when heat is applied. Namely, when heat is applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. The water impermeable membrane may be used in a variety of thicknesses, clarities, strengths and shrink ratios. The water impermeable membrane may comprise polyolefin and may be a material made up of polymer plastic film. Polyolefin is a type of polymer produced from a simple olefin (also called an alkene) as a monomer. Other examples of materials used for the water impermeable membrane include PVC, polyethylene, polypropylene, EP/EVA/copolyester/EVA/EP (where EP is ethylene-propylene and EVA is ethylene-vinyl acetate copolymer) and other compositions.

The water impermeable membrane may be provided in rolls **110** of a certain width. In one embodiment, each roll **110** of the water impermeable membrane comprises a width of about 24 to 42 inches, with each roll provided from about 40 feet to about 120 feet of length of the water impermeable membrane. FIG. **1** shows that several rolls **110** of the impermeable membrane have been placed on top of the damaged roof **102** of the residential structure **100**. Each roll **110** is unrolled on top of the damaged roof **102** in the same

direction and the sides of each unrolled strip of impermeable membrane are placed adjacent to another unrolled strip of impermeable membrane, such that the sides of each unrolled strip are coupled with the sides of the unrolled strips adjacent, as described more fully below.

FIG. **2** is an illustration of a close-up perspective view of the residential structure **100** with the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **2** shows multiple rolls **110** of the impermeable membrane have been placed on top of the damaged roof **102** of the residential structure **100** in order to protect said roof, and the contents of the residential structure **100**, from further damage or decay from precipitation, wind, etc. FIG. **2** shows that each roll **110** is unrolled, either fully or partially, on top of the damaged roof **102** in the same direction. FIG. **2** also shows that the sides of each unrolled strip **202** of impermeable membrane are placed adjacent to another unrolled strip **204** of impermeable membrane. More specifically, FIG. **2** shows that the sides of each unrolled strip **202** of impermeable membrane are placed so as to overlap (by about 3 to 8 inches) with the sides of the adjacent unrolled strip **204** of impermeable membrane. In one embodiment, each unrolled strip **202** of impermeable membrane are placed so as to overlap with the sides of the adjacent unrolled strip **204** of impermeable membrane by exactly 3 inches. Subsequently, the sides of each unrolled strip are coupled with the sides of the unrolled strips adjacent, as described more fully below.

FIG. **3** is an illustration showing construction material **302** in the process of being wrapped in the impermeable membrane **304**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. In FIG. **3**, the construction material **302** is a piece of lumber, which is a type of wood that has been processed into beams and planks. A plank, i.e., a wood plank or plank of wood, is timber that is flat, elongated, and rectangular with parallel faces that are higher and longer than wide. Planks are usually more than 1½ in (38 mm) thick and are generally wider than 2½ in (64 mm). Planks can be any length and are generally a minimum of 2 in (51 mm) deep by 8 in (200 mm) wide, but planks that are 2 in (51 mm) by 10 in (250 mm) and 2 in (51 mm) by 12 in (300 mm) are more common. In one embodiment, the construction material **302** is a wood plank that measures 2 in ×4 in, 2 in ×6 in, 2 in ×8 in, or 2 in ×12 in. In one embodiment, the construction material **302** is a wood plank that measures 1'×2'×8'.

In other embodiments, the construction material **302** may be other items, such as portions of metal siding, portions of roof tile, etc. FIG. **3** shows the roll **110** of impermeable membrane has been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves of the damaged roof **102** of the residential structure. FIG. **3** shows that the end of the unrolled strip **202** (which was rolled around the construction material **302**) has been attached to the construction material **302** via one or more fasteners **309**, which is a staple. In one embodiment, T50 ⅜' galvanized steel staples are placed 4 inches apart on the end of the unrolled strip **202**. In another embodiment, exactly 24 staples are placed on the end of the unrolled strip **202** per instance (or plank) of construction material **302**, so as to attach the unrolled strip to the construction material. Other types of fasteners may be used to attach the construction material **302** to the end of the unrolled strip **202**, such as nails, clips, screws, etc. Also, adhesive may be used to attach the construction material **302** to the end of the unrolled strip **202**. FIG. **3** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202** in a clockwise **319** direction so that the open end of the roll faces downwards.

In an alternative embodiment, the construction material **302** is a flexible piece of plastic strip that is available in a coiled form in 50-foot coils. The plastic, which may be regrind plastic, is uncoiled for use as the construction material for attaching to the roof. The plastic strip is wrapped in the end of the unrolled strip **202** as described above, and the unrolled strip is attached to the plastic strip as described above. Said plastic strip is smaller than wood planks, easier to store, flexible for use in different shapes and allows work crews to work more efficiently.

FIG. **4** is an illustration showing construction material **302** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **4** shows the roll **110** of impermeable membrane had been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves **409** of the damaged roof **102**, so as to be applied to the construction material **302**. FIG. **4** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **409** of the damaged roof **302**. Note that the construction material **302** is attached to the vertical, outward-facing fascia **408** of the eaves of the roof. In one embodiment, each instance of the construction material **302** is spaced 4 inches apart from the next instance of the construction material on the fascia **408** of the eaves of the roof, around the entire perimeter of the roof. Through testing, the applicant discovered that less than 4 inches would result in a roof not being properly vented and more than 4 inches would not be secure (waterproof) enough.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, the plastic is uncoiled for use as the construction material for attaching to the roof, and the plastic strip is attached to the vertical, outward-facing fascia **408** of the eaves of the roof as described above.

FIG. **5** is an illustration showing a cross-sectional view of construction material **302** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **5** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **409** of the damaged roof **102**. The construction material **302** may be wrapped such that the end of the unrolled strip **302** completely surrounds the construction material 1 time, 2 times, or 3-4 times. I.e., in one embodiment, construction material **302** is wrapped 1 time, 2 times, or 3-4 times in the end of the unrolled strip.

FIG. **5** shows that the end of the unrolled strip **202** (after wrapping the construction material **302**) has been attached to the construction material **302** via a fastener **309**, which is a staple. FIG. **5** further shows that the construction material **302** and the end of the unrolled strip **202** (which wraps around the construction material **302**) has been attached to the eaves **409** of the roof via one or more fasteners **502**, which is a nail. Other types of fasteners may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof, such as clips, screws, etc. Also, adhesive may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof. In one embodiment, the fastener

502 is a #10 3-inch polymer-coated exterior screw placed every 16 inches along the length of the construction material 302 and the end of the unrolled strip 202, so as to attach the construction material 302 and the end of the unrolled strip 202 to the fascia 408. If the fascia 408 consists of concrete, brick or block, then the fastener 502 is a ¼"×2¾" concrete anchor placed every 16 inches along the length of the construction material 302, so as to attach the construction material 302 and the end of the unrolled strip 202 to the fascia 408. In one embodiment, the fastener 502 is a 3"×0.120 galvanized nail deployed with a nail gun and placed every 16 inches along the length of the construction material 302 and the end of the unrolled strip 202, so as to attach the construction material 302 and the end of the unrolled strip 202 to the fascia 408. In another embodiment, exactly 6 nails or screws are placed along the length of the construction material 302 and the end of the unrolled strip 202, so as to attach the construction material 302 and the end of the unrolled strip 202 to the fascia 408.

In one embodiment, the method or process of attaching the ends of the unrolled strip 202 to the eaves of the damaged roof 102 occurs as follows. A first unrolled strip of the impermeable membrane is draped over the roof 102, wherein the end of the strip overhangs the eaves of the roof. Then, a wood plank is placed horizontally under the end of the strip that overhangs the eaves of the roof, such that the wood plank is placed below the eaves of the roof. The wood plank is placed far enough below the eaves of the roof such that when the wood plank is rolled up in the end of the strip (described below), the wood plank is at the height of the fascia of the eaves of the roof. Next, the left and right sides of the strip are cut vertically such that the strip is coextensive with a length of the wood plank. The end of the strip is also cut horizontally below the wood plank. That is, assuming the wood plank is placed horizontally so that it is parallel with the fascia of the eaves of the roof, a vertical cut is placed in the end of the strip on the left of the wood plank, a vertical cut in placed in the end of the strip on the right of the wood plank, and a horizontal cut is placed in the end of the strip below the wood plank.

In an alternative embodiment where the construction material 302 is a flexible piece of plastic strip (wherein the plastic is uncoiled for use as the construction material for attaching to the roof, and the plastic strip is attached to the vertical, outward-facing fascia 408 of the eaves of the roof), the plastic strip is placed horizontally under the end of the membrane strip that overhangs the eaves of the roof, such that the plastic strip is placed below the eaves of the roof. The plastic strip is placed far enough below the eaves of the roof such that when the plastic strip is rolled up in the end of the membrane strip (described below), the plastic strip is at the height of the fascia of the eaves of the roof. The left and right sides of the membrane strip are not necessarily cut vertically. The end of the membrane strip may be cut horizontally below the plastic strip. That is, assuming the plastic strip is placed horizontally so that it is parallel with the eaves of the roof, a horizontal cut is placed in the end of the membrane strip below the plastic strip. There is no need to cut the membrane strip vertically because the plastic strip may be extended beyond the left and right edges of the membrane strip.

Returning to the wood plank embodiment, the wood plank is fastened to the end of the strip using a plurality of staples. Next, the wood plank is rolled one full turn, two full turns, or three full turns in the end of the strip, such that the wood plank is at a height of the fascia of the eaves of the roof. Then, the wood plank that was rolled in the end of the strip is attached to the fascia of the eaves of the roof using a plurality of nails. Further, each strip of the impermeable membrane that has been draped over the roof is placed such that it overlaps at least three inches with each adjacent strip of the impermeable membrane that has been draped over the roof. The steps above are repeated until the entire roof is covered in the impermeable membrane. Finally, heat is applied using a heat source to a portion of each strip that overlaps an adjacent strip, so as to meld the portion of each strip with the adjacent strip (as described more fully below). Also, heat may be applied using a heat source to all or a portion of the impermeable membrane on the roof, so as to shrink the membrane for aerodynamic purposes (to reduce or eliminate the membrane blowing off in a wind) and for hydrodynamic purposes to aid in water running or falling off the roof.

FIG. 6 is an illustration showing two strips 602, 604 of the impermeable membrane being fastened together using heat, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. Recall that the water impermeable membrane that may shrink when heat is applied. Namely, when heat is applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. FIG. 6 shows that the sides 612, 614 of the two strips 602, 604 of the water impermeable membrane are placed such that that the sides of each strip overlap (by about 3 to 8 inches) with the sides of the adjacent strip of impermeable membrane. Subsequently, heat is applied to the overlapping portion of the sides of each strip using a blowtorch or other heat device 610. As a result, the sides 612, 614 of the two strips 602, 604 of the water impermeable membrane are melded together, thereby producing a seam that is also water impermeable.

FIG. 7 is an illustration showing two strips 602, 604 of the impermeable membrane being fastened together using a roller device 702, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. 7 shows that the sides 612, 614 of the two strips 602, 604 of the water impermeable membrane were placed such that that the sides of each strip overlap and heat was applied to the overlapping portion so that the sides 612, 614 of the two strips 602, 604 of the water impermeable membrane were melded together, thereby producing a seam that is also water impermeable. FIG. 7 shows that a roller 702 is applied to the overlapping portion or seam so as to secure the sides 612, 614 of the two strips 602, 604 of the water impermeable membrane together. The roller 702 may comprise a cylinder 704 that rotates as it rolls over the overlapping portion, thereby patting down any bubbles or undulations in the overlapping portion. The purpose of applying the roller 702 is to flatten the overlapping portion or seam as much as possible, resulting in a stronger seam and a flatter surface that optimizes water runoff.

The roller 702 may comprise leather that has been placed over the cylinder 704. A Kevlar thread may be used to sew the leather onto the cylinder 704 of the roller 702. Said roller cover withstands high heat and allows users to fuse the sides or seams of the strips 602, 604 together.

FIG. 8 is an illustration of a perspective view of the residential structure 100 with a damaged roof 102, showing

the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment. FIG. **8** shows that multiple rolls **110** of the impermeable membrane have been draped on top of the damaged roof **102** of the residential structure **100** in the same direction and the sides of each unrolled strip of impermeable membrane have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof is covered in the impermeable membrane. Finally, sandbags may be placed on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof. FIG. **8** shows that the construction material **302** on the eaves of the roof has been wrapped in the end of the unrolled strip **202** in a clockwise direction so that the open end of the roll faces downwards. This reduces or eliminates the pooling of water in the open end of the roll.

Said process described above for waterproofing a structure can also be used to provide wall insulation for a wall of a structure, to provide dust barriers for a structure, to provide waterproofing of a structure during construction, to provide waterproofing of a structure under construction that is lacking exterior windows, doors and walls, and for containment of the interior of buildings. Said process described above for waterproofing a structure can also be used to provide a separation in the interior of buildings or warehouses for smaller temporary rooms for security or temperature control.

FIG. **9** is another illustration showing construction material **902** in the process of being wrapped in the impermeable membrane **304**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. In FIG. **9**, the construction material **902** is rolled in the end of the unrolled strip **202** in a counterclockwise direction **919** so that an open end of the roll faces upwards. FIG. **9** shows the roll **110** of impermeable membrane has been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves of the damaged roof **102** of the residential structure. FIG. **9** shows that the end of the unrolled strip **202** (which was rolled around the construction material **902**) has been attached to the construction material **902** via a fastener **309**, which is a staple.

FIG. **10** is an illustration showing construction material **902** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. Note that the construction material **902** is attached to the vertical, outward-facing fascia of the eaves of the roof. FIG. **10** shows that the construction material **902** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves of the damaged roof **102**.

In the event that attachment of the construction material **902** can't be made below the eaves of the roof, sandbags may be placed at the edge of the roof surface. Sandbags may be placed approximately 4-6' inside the edge of the strip of impermeable membrane **304** from the edges of the roof. The end of the strip of impermeable membrane **304** may be folded over the sandbags and the end of the strip of impermeable membrane **304** may be heat treated (as shown in FIG. **6**), therefore encapsulating the sandbags. Sandbags may be placed every 15-20'. Once heated, the sandbags may be rolled one additional time on to itself to provide added support.

FIG. **11** is an illustration showing a cross-sectional view of construction material **902** completely wrapped in the impermeable membrane **304** and attached to the fascia of the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **11** shows that the construction material **902** has been wrapped in the end of the unrolled strip **202** in a counterclockwise direction so that the open end of the roll faces upwards. The construction material **902** may be wrapped such that the end of the unrolled strip **202** completely surrounds the construction material 1-time, 2-times or, alternatively, 3-4 times. I.e., in one embodiment, construction material **902** is wrapped 1-time, 2-times or, alternatively, 3-4 times in the end of the unrolled strip. FIG. **11** shows that the end of the unrolled strip **202** (after wrapping the construction material **902**) has been attached to the construction material **902** via a nail **502**.

FIG. **12** is another illustration of a perspective view of the residential structure **100** with a damaged roof **102**, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment. FIG. **12** shows that multiple rolls **110** of the impermeable membrane have been draped on top of the damaged roof **102** of the residential structure **100** in the same direction and the sides of each unrolled strip of impermeable membrane have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof is covered in the impermeable membrane. FIG. **12** shows that the construction material **902** on the eaves of the roof has been wrapped in the end of the unrolled strip **202** in a counterclockwise direction so that the open end of the roll faces upwards.

FIG. **13** is an illustration showing how an end of the strip of membrane is cut, according to an example embodiment. In one embodiment, the method or process of attaching the ends of the unrolled strip **1304** to the eaves of the damaged roof **102** occurs as follows. A first unrolled strip **1304** of the impermeable membrane **1302** is draped over the roof **102**, wherein the end of the strip overhangs the eaves of the roof. Then, a wood plank **1306** is placed horizontally under the end of the strip **1304** that overhangs the eaves of the roof, such that the wood plank is placed below the eaves of the roof. The wood plank is placed far enough below the eaves of the roof such that when the wood plank is rolled up in the end of the strip, the wood plank is at the height of the eaves of the roof.

Next, the right side of the strip **1304** is cut (using a cutting device, such as scissors **1320**) vertically along a line **1314** to substantially match the length of the wood plank **1306**. Said cut on the right side of the strip **1304** may be 6 inches long and may be placed at least one inch from the right side of the plank **1306**. Also, the left side of the strip **1304** is cut vertically along a line **1312** to substantially match the length of the wood plank **1306**. Said cut on the left side of the strip **1304** may be 6 inches long and may be placed at least one inch from the left side of the plank **1306**. Next, the end of the strip **1304** is cut horizontally along a line **1310** below the wood plank **1306**. Said cut may be placed flush with the bottom of the plank **1306**, or may be placed at least one inch from the bottom of the plank **1306**. Then, the wood plank is rolled in the strip **1304** as described above. Subsequently, the wood plank is fastened to the end of the strip using a plurality of staples. Next, the wood plank is rolled one full turn, two full turns, or three full turns in the end of the strip, such that the wood plank is at a height of the eaves of the roof. Then, the wood plank that was rolled in the end of the strip is attached to the eaves of the roof using a plurality of nails.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, the plastic

strip is placed horizontally under the end of the membrane strip that overhangs the eaves of the roof, such that the plastic strip is placed below the eaves of the roof. The plastic strip is placed far enough below the eaves of the roof such that when the plastic strip is rolled up in the end of the membrane strip (described below), the plastic strip is at the height of the fascia of the eaves of the roof. The left and right sides of the membrane strip are not necessarily cut vertically. The end of the membrane strip may be cut horizontally below the plastic strip. That is, assuming the plastic strip is placed horizontally so that it is parallel with the eaves of the roof, a horizontal cut is placed in the end of the membrane strip below the plastic strip. There is no need to cut the membrane strip vertically because the plastic strip may be extended beyond the left and right edges of the membrane strip.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, a high-rise building attachment method is also disclosed. The process may begin on the second floor of the building, wherein a 2×4 wood plank is attached on an outside edge. Enough impermeable membrane is rolled out to extend to the bottom floor f the building with an extra door to make attachments. The flexible plastic strip is unrolled and attached to the outer most portion of the 2×4 using 2" screws. Then, the impermeable membrane is unrolled to the 1st floor. Next, on the 3rd floor of the building, a 2×4 wood plank is attached on an outside edge. Impermeable membrane is attached to the 3^{rd} floor and unrolled to the second floor. The flexible plastic strip is unrolled and attached to the outer most portion of the 2×4 of the 3^{rd} floor using 2" screws. Then, the impermeable membrane is unrolled to the 2nd floor. The ends of the impermeable membrane on the 2^{nd} floor are attached to the outer most portion of the 2×4 using 2" screws. This process is repeated for the entire high-rise.

Embodiments may be described above with reference to functions or acts, which comprise methods. The functions/acts noted above may occur out of the order as shown or described. For example, two functions/acts shown or described in succession may in fact be executed substantially concurrently or the functions/acts may sometimes be executed in the reverse order, depending upon the functionality/acts involved. While certain embodiments have been described, other embodiments may exist. Further, the disclosed methods' functions/acts may be modified in any manner, including by reordering functions/acts and/or inserting or deleting functions/acts, without departing from the spirit of the claimed subject matter.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A method for covering a roof with an impermeable membrane, comprising:

a) draping a strip of the impermeable membrane over the roof, wherein an end of the strip overhangs a fascia of the eaves of the roof;

b) placing a rigid, elongated piece of construction material in a horizontal position under the end of the strip that overhangs the fascia of the eaves of the roof, such that the construction material is placed below the fascia of the eaves of the roof;

c) cutting the end of the strip as follows: 1) a horizontal cut below a position of the construction material, 2) a vertical cut to the left of the construction material, and 3) a vertical cut to the right of the construction material, such that a resulting shape of the end of the strip is substantially commensurate with the construction material;

d) fastening the construction material to the end of the strip using a plurality of first fasteners;

e) rolling the construction material at least one full turn in the end of the strip that overhangs the fascia of the eaves of the roof;

f) attaching the construction material that was rolled in the end of the strip to the fascia of the eaves of the roof using a plurality of second fasteners; and

g) repeating steps a) through f) until the entire roof is covered in the impermeable membrane.

2. The method of claim **1**, further comprising:

h) overlapping at least three inches of a first strip of the impermeable membrane that has been draped over the roof with a second strip of the impermeable membrane that has been draped over the roof.

3. The method of claim **2**, further comprising:

i) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to the entire impermeable membrane, so as to shrink the entire impermeable membrane.

4. The method of claim **3**, further comprising:

j) placing sandbags on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof.

5. The method of claim **4**, wherein the rigid, elongated piece of construction material comprises a wood plank.

6. The method of claim **5**, wherein the first fasteners comprise staples.

7. The method of claim **6**, wherein the second fasteners comprise nails.

8. A method for covering a roof with an impermeable membrane, comprising:

a) draping a strip of the impermeable membrane over the roof, wherein an end of the strip overhangs a fascia of eaves of the roof;

b) placing a rigid, elongated piece of construction material in a horizontal position under the end of the strip that overhangs the fascia of the eaves of the roof, such that the construction material is placed below the fascia of the eaves of the roof;

c) cutting the end of the strip as follows: 1) a horizontal cut below a position of the construction material, 2) a vertical cut to the left of the construction material, and 3) a vertical cut to the right of the construction material, such that a resulting shape of the end of the strip is substantially commensurate with the construction material;

d) fastening the construction material to the end of the strip using a plurality of staples;

e) rolling the construction material at least one full turn in the end of the strip that overhangs the fascia of the eaves of the roof;

f) attaching the construction material that was rolled in the end of the strip to the fascia of the eaves of the roof using a plurality of screws; and

g) repeating steps a) through f) until the entire roof is covered in the impermeable membrane.

9. The method of claim 8, further comprising:

h) overlapping at least three inches of a first strip of the impermeable membrane that has been draped over the roof with a second strip of the impermeable membrane that has been draped over the roof.

10. The method of claim 9, further comprising:

i) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to the entire impermeable membrane, so as to shrink the entire impermeable membrane.

11. The method of claim 10, further comprising:

j) placing sandbags on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof.

12. The method of claim 4, wherein the rigid, elongated piece of construction material comprises a wood plank.

13. A method for covering a roof with an impermeable membrane, comprising:

a) draping a strip of the impermeable membrane over the roof, wherein an end of the strip overhangs a fascia of eaves of the roof;

b) placing a flexible strip of construction material in a horizontal position under the end of the strip that overhangs the fascia of the eaves of the roof, such that the construction material is placed below the fascia of the eaves of the roof;

c) cutting the end of the strip as follows: a horizontal cut below a position of the construction material;

d) fastening the construction material to the end of the strip using a plurality of first fasteners;

e) rolling the construction material at least one full turn in the end of the strip that overhangs the fascia of the eaves of the roof;

f) attaching the construction material that was rolled in the end of the strip to the fascia of the eaves of the roof using a plurality of second fasteners; and

g) repeating steps a) through f) until the entire roof is covered in the impermeable membrane.

14. The method of claim 13, further comprising:

h) overlapping at least three inches of a first strip of the impermeable membrane that has been draped over the roof with a second strip of the impermeable membrane that has been draped over the roof.

15. The method of claim 14, further comprising:

i) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to the entire impermeable membrane, so as to shrink the entire impermeable membrane.

16. The method of claim 15, further comprising:

j) placing sandbags on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof.

17. The method of claim 16, wherein the construction material comprises a flexible plastic strip available in a coiled form.

18. The method of claim 17, wherein the first fasteners comprise staples.

19. The method of claim 18, wherein the second fasteners comprise nails.

* * * * *

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Mouriz et al.

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(45) **Date of Patent: *Dec. 1, 2020**

(54) **METHOD FOR COVERING ROOF WITH SHRINK WRAP**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(21) Appl. No.: **16/902,851**

(22) Filed: **Jun. 16, 2020**

(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation-in-part of application No. 16/681,421, filed on Nov. 12, 2019, now Pat. No. 10,683,666, which is a continuation-in-part of application No. 16/294,554, filed on Mar. 6, 2019, now Pat. No. 10,472,827.

(51) **Int. Cl.**

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E04D 5/14	(2006.01)
E04D 5/06	(2006.01)
E04D 12/00	(2006.01)
E04D 13/16	(2006.01)
E04D 15/04	(2006.01)

(52) **U.S. Cl.**

CPC ***E04D 5/142*** (2013.01); ***E04D 5/06*** (2013.01); ***E04D 5/145*** (2013.01); ***E04D 12/004*** (2013.01); ***E04D 13/1681*** (2013.01); *E04D 5/148* (2013.01); *E04D 2015/045* (2013.01)

(58) **Field of Classification Search**

CPC E04D 5/146; E04D 5/142; E04D 15/04; E04D 5/06; E04D 2015/042

See application file for complete search history.

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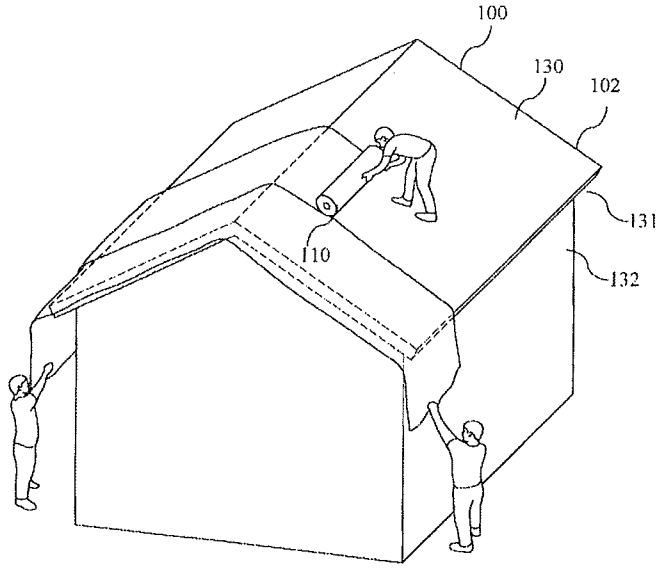
Primary Examiner — Patrick J Maestri
(74) *Attorney, Agent, or Firm* — Mark Terry

(57) **ABSTRACT**

A system and method for covering at least a portion of a roof with an impermeable membrane is provided. The method includes placing a strip of the impermeable membrane over a subset of the portion of the roof intended to be covered, cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered, fastening a flexible, elongated band of material to the end of the strip using a plurality of first fasteners, rolling the band of material at least one half turn in the end of the strip, attaching the band of material that was rolled in the end of the strip to a fascia of eaves of the roof using a plurality of second fasteners, and repeating the steps above until the portion of the roof is covered in the impermeable membrane.

19 Claims, 8 Drawing Sheets



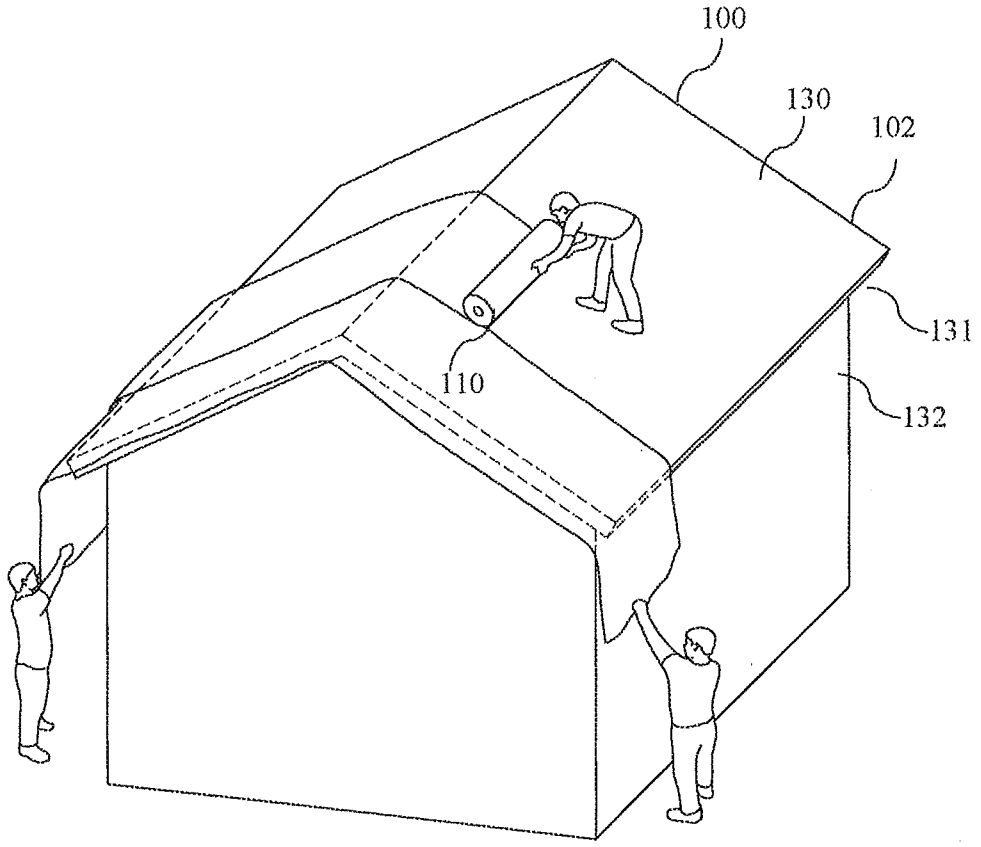


Fig. 1

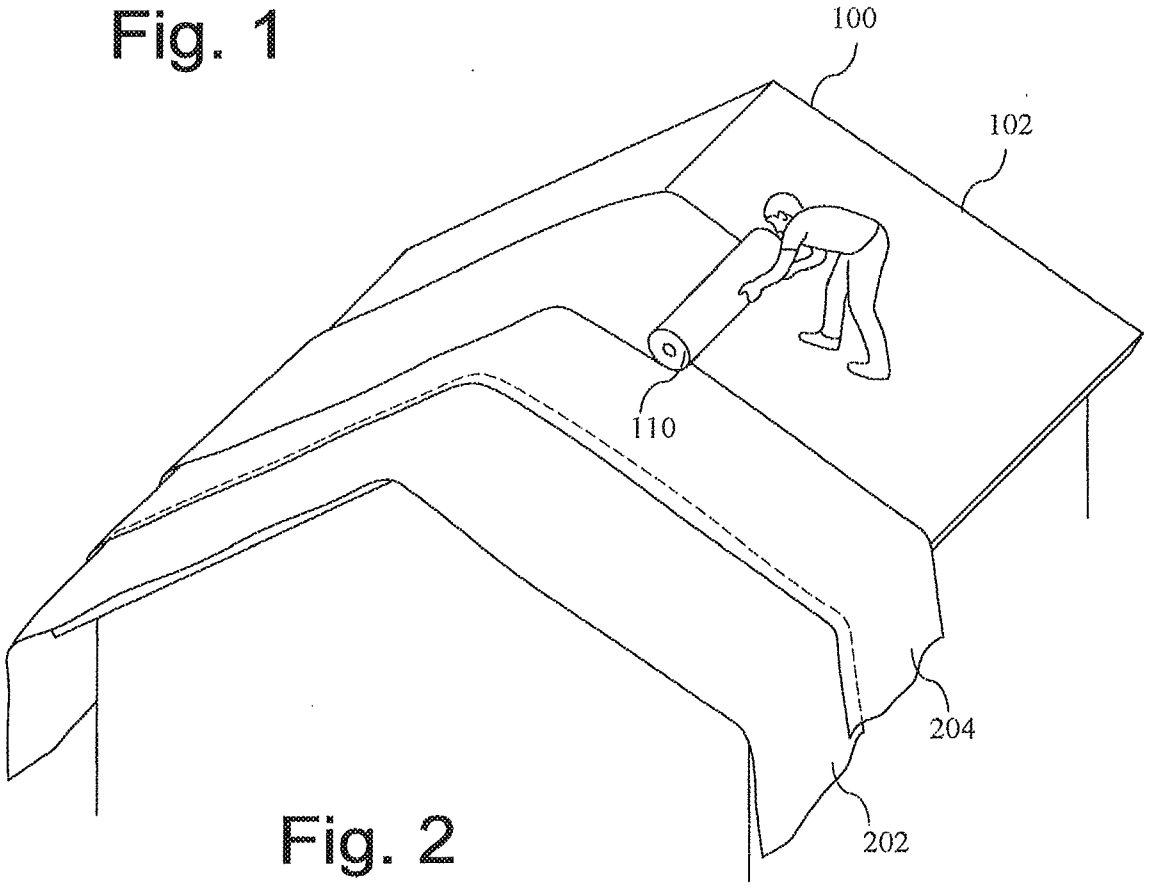


Fig. 2

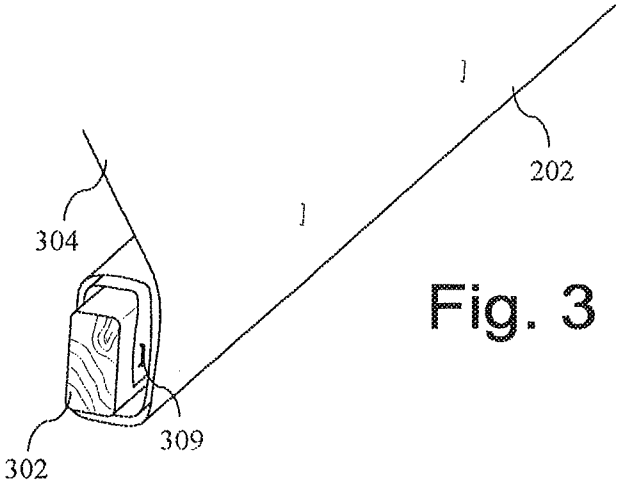


Fig. 3

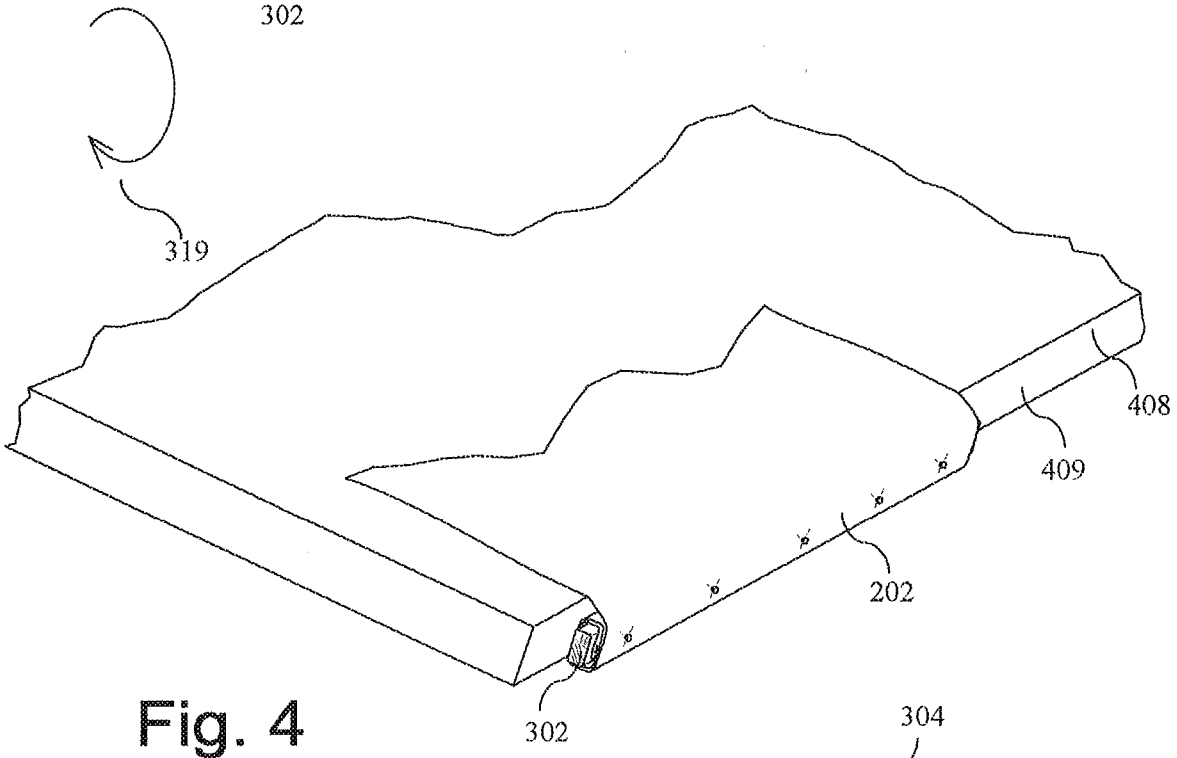


Fig. 4

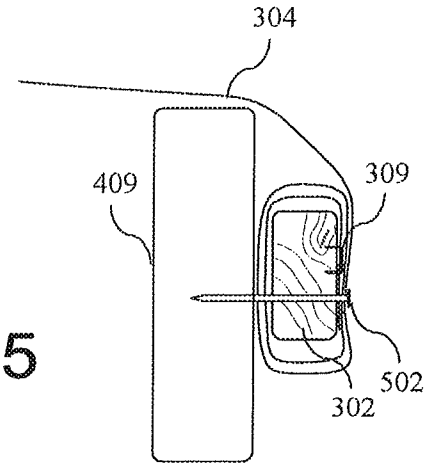


Fig. 5

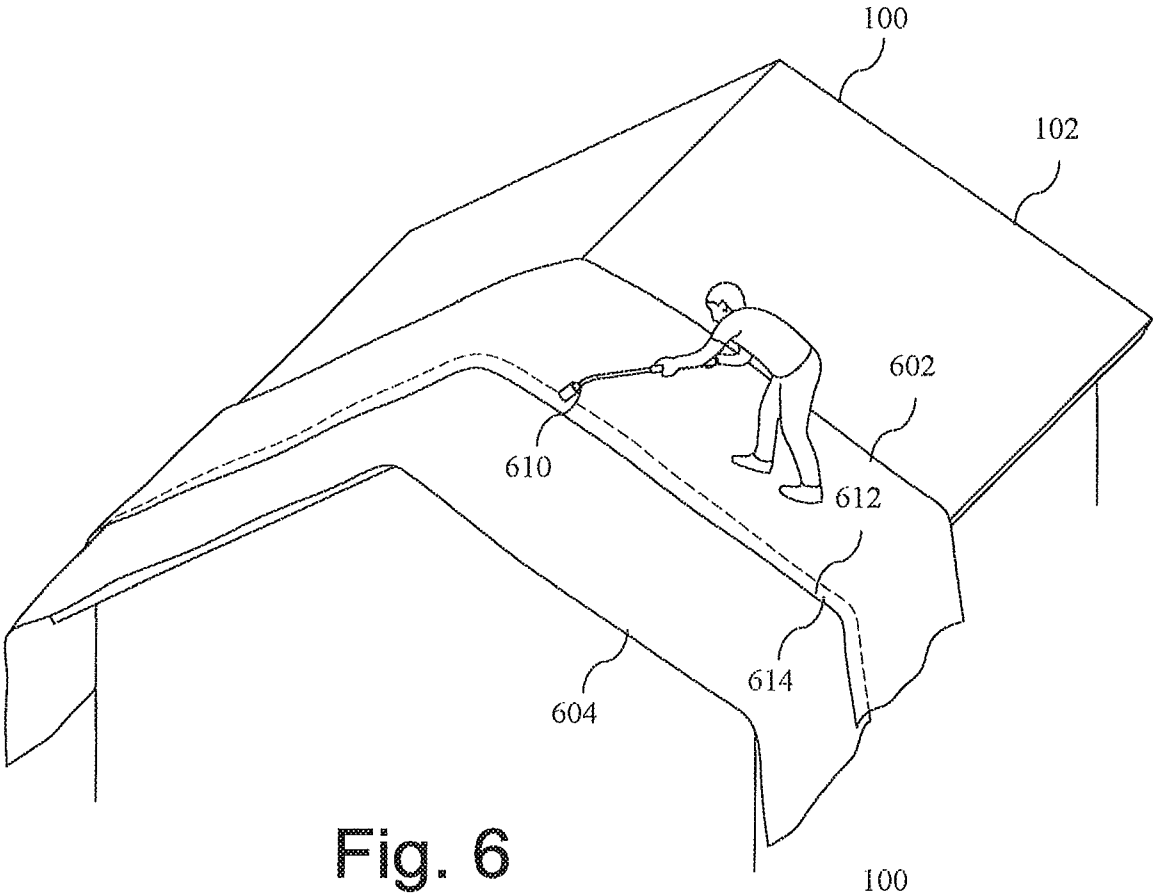


Fig. 6

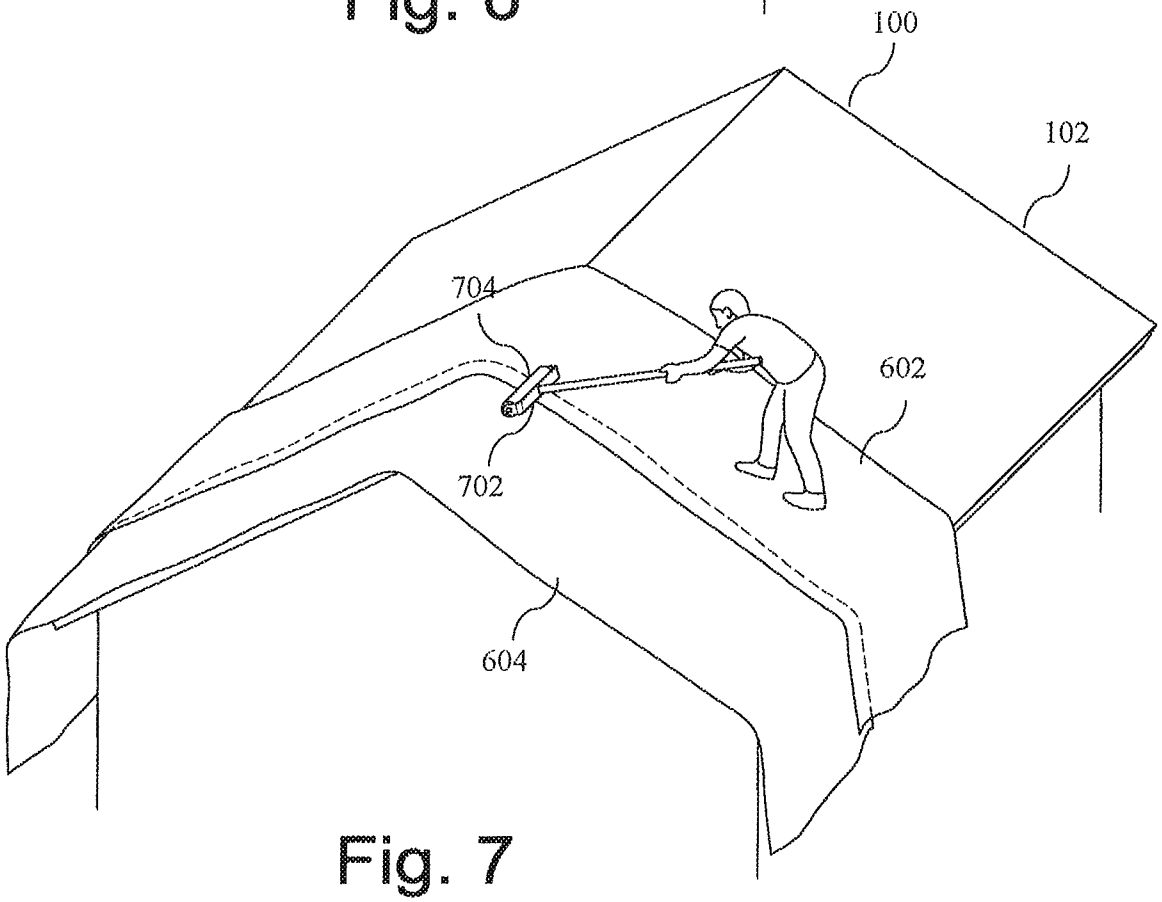


Fig. 7

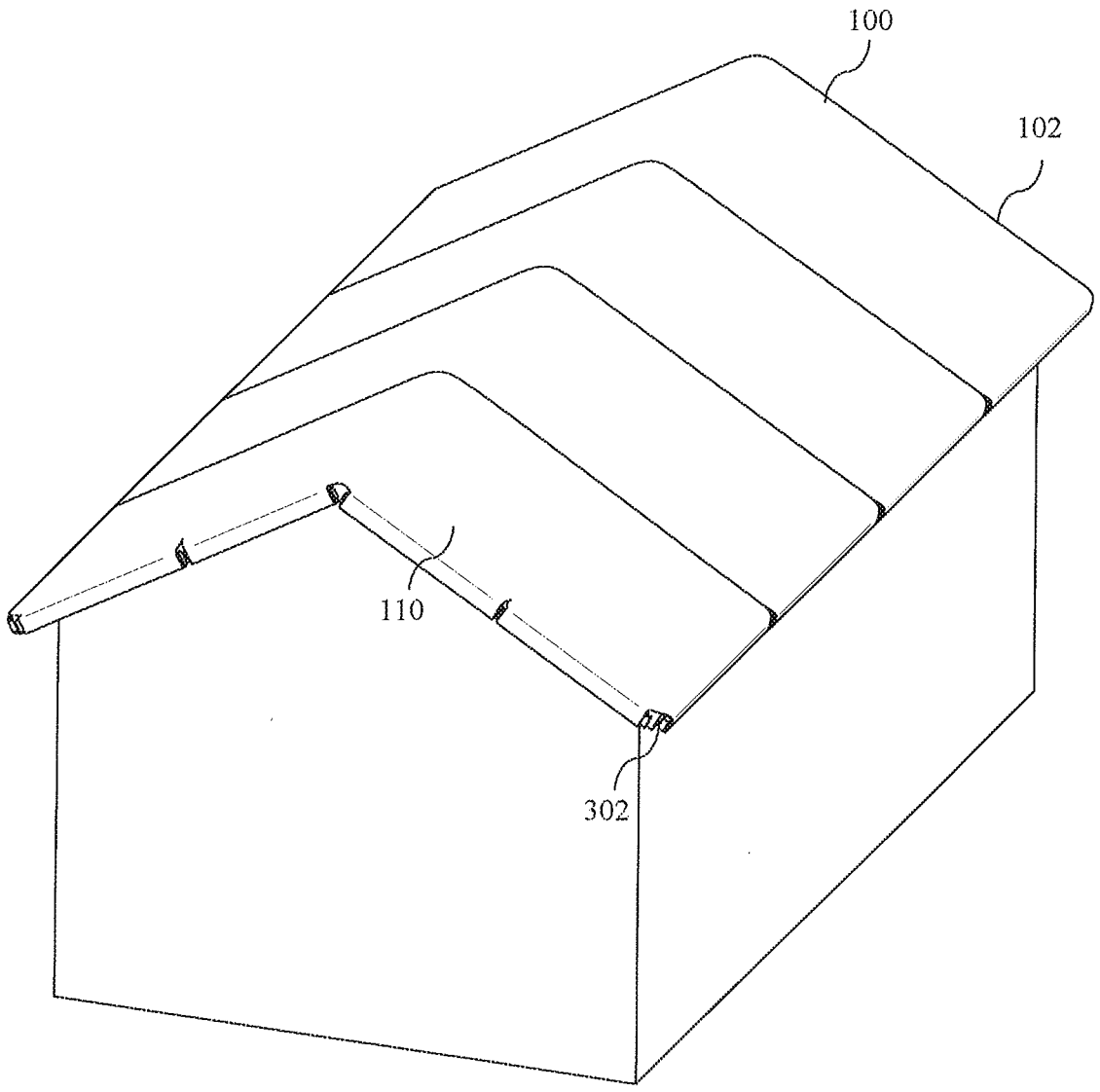


Fig. 8

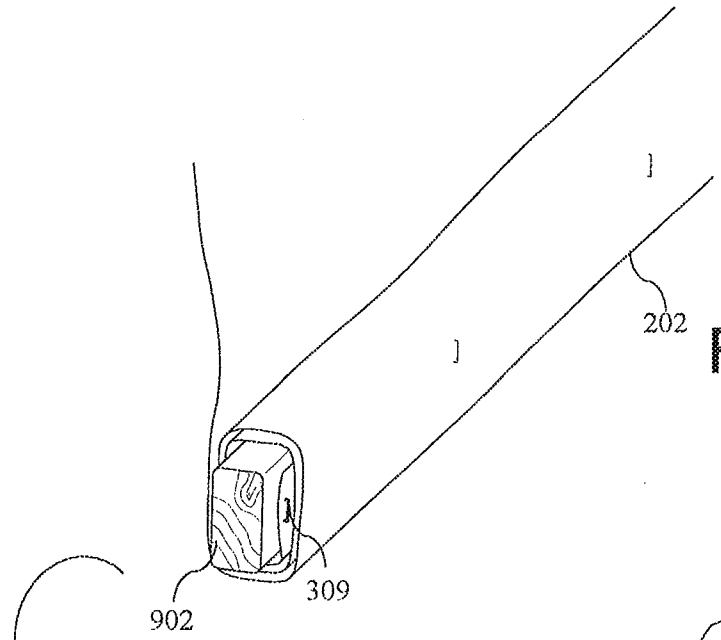


Fig. 9

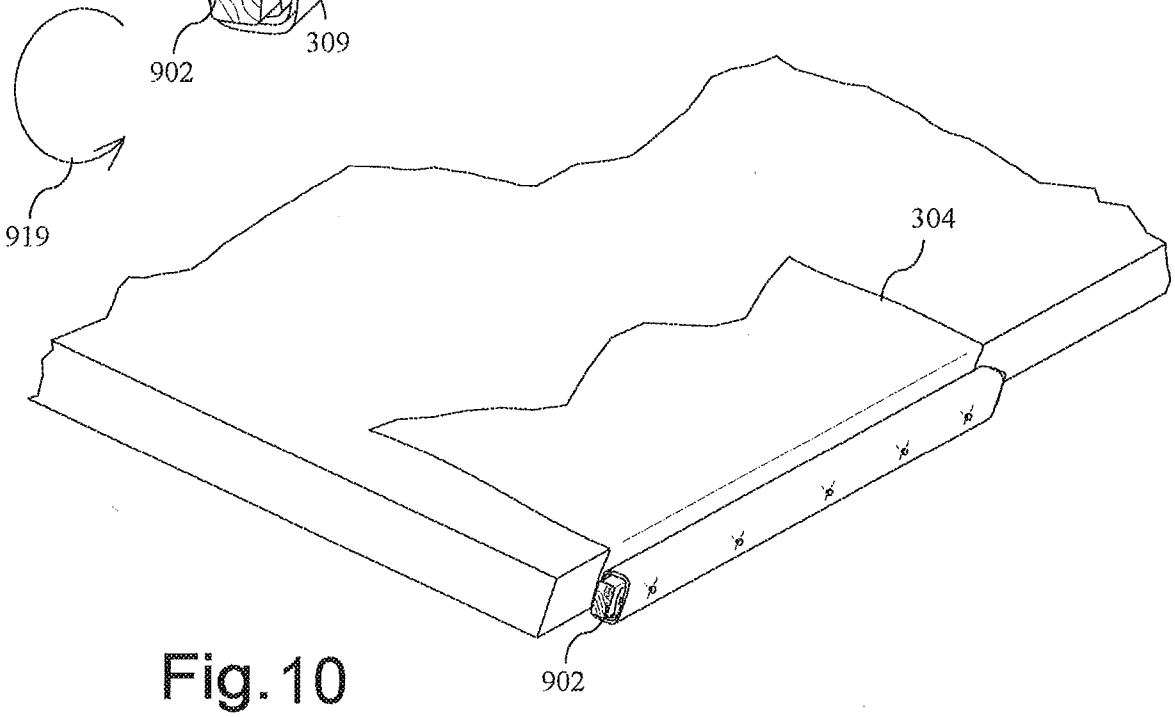


Fig. 10

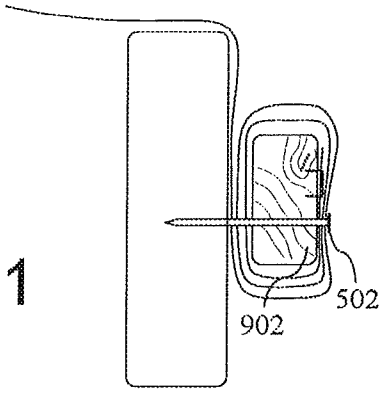


Fig. 11

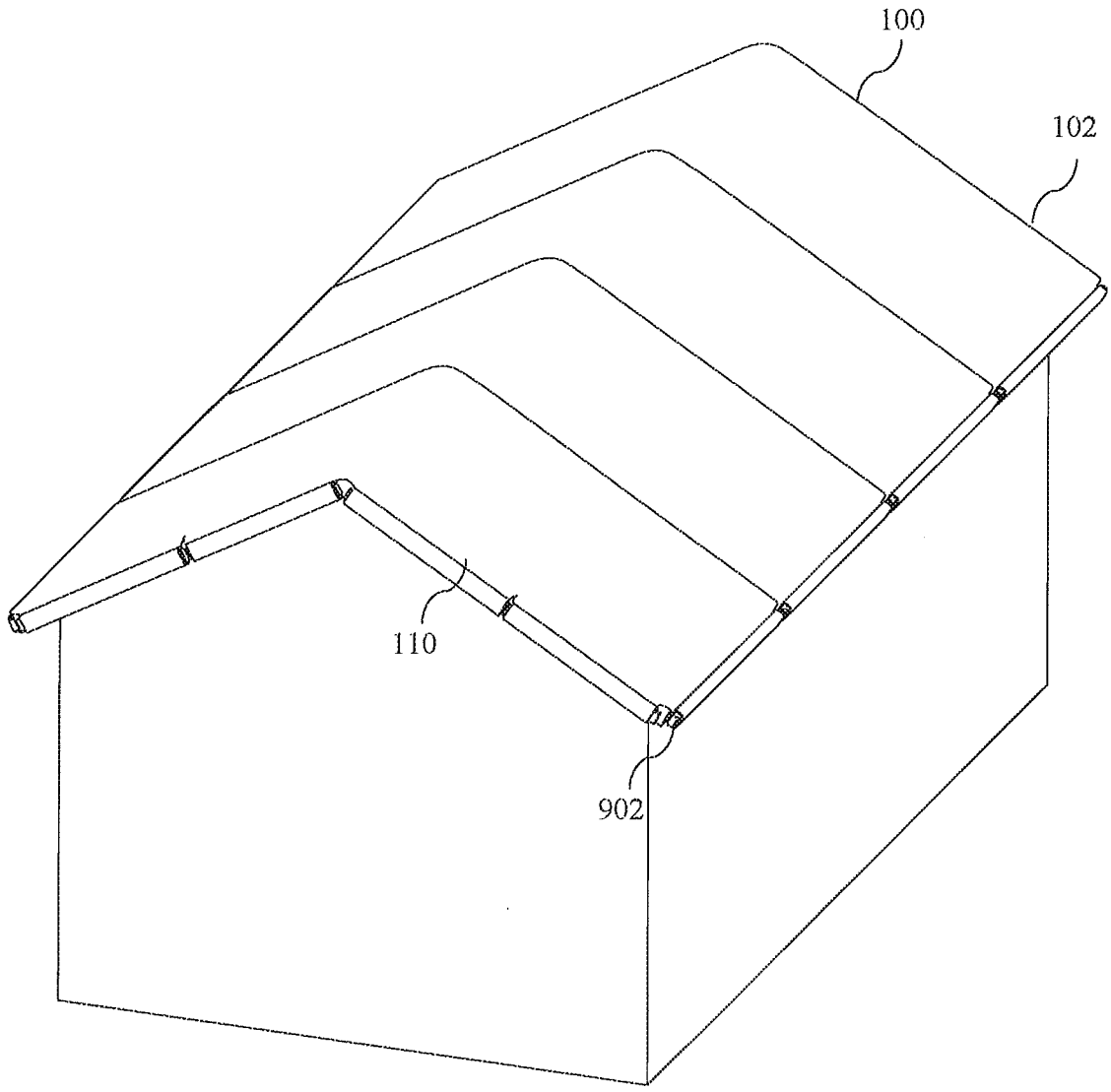


Fig. 12

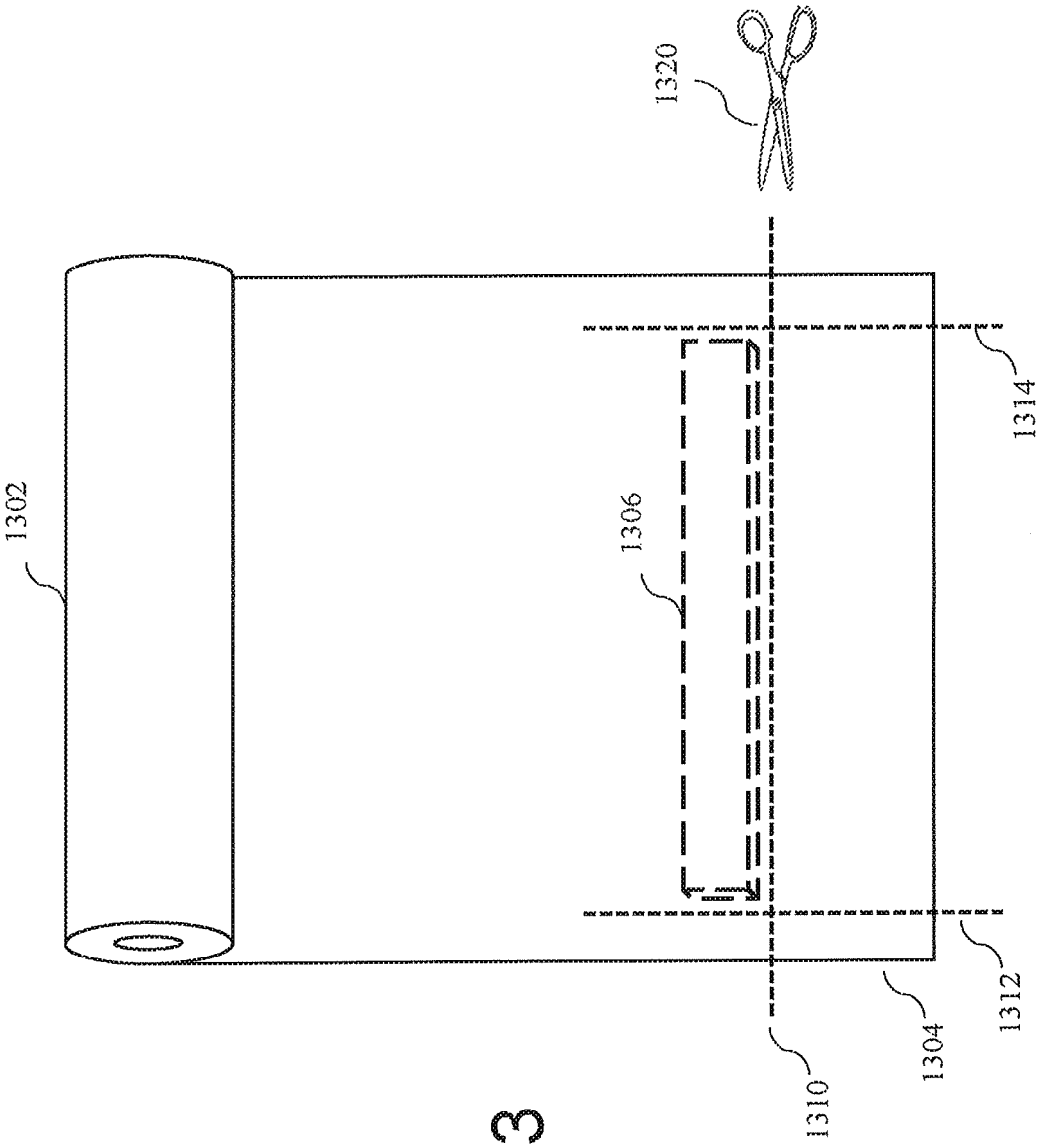


Fig. 13

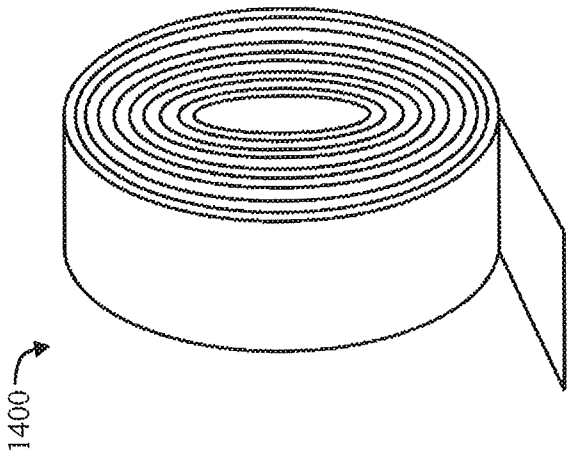


Fig. 14

METHOD FOR COVERING ROOF WITH SHRINK WRAP

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of, and claims priority to, application Ser. No. 16/681,421 filed Nov. 12, 2019 and titled "Method for Covering Roof with Shrink Wrap", which is a continuation in part of application Ser. No. 16/294,554 (now a U.S. Pat. No. 10,472,827) filed Mar. 6, 2019 and titled "Method for Covering Roof with Shrink Wrap." The subject matter of application numbers 16681421 and 16294554 are hereby incorporated by reference in their entirety.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable.

INCORPORATION BY REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

Not Applicable.

TECHNICAL FIELD

The technical field relates generally to the field of residential and commercial structural maintenance and, more specifically, relates to the field of roof maintenance for residential and commercial structures.

BACKGROUND

Maintenance is the process of ensuring that buildings and structures retain a good appearance and operate at optimum efficiency. Inadequate maintenance can result in decay, degradation and reduced performance and can affect health and threaten the safety of users, occupants and others in the vicinity. Building structure, and roofs in particular, are regularly subjected to harsh conditions including wind, rain, snow, heat, cold, and storms. Said conditions can cause damage to the roof, as well as the interior of the structure. For these reasons, roofs require regular maintenance to maintain optimum efficiency and continue to accomplish their design goals.

When roofs suffer significant damage, however, significant construction or refurbishing services may be necessary. This may require a long period of time to accomplish, as contractors must be found and assigned to the job, permits must be obtained, and money must be allocated and transferred. During this period time, the roof cannot be left unattended, as the roof the contents of the structure may suffer further damage. In these situations, therefore, temporary remedial or protective measures are necessary.

Various approaches to this problem have been proposed. A well-known approach to this problem is to attach a temporary water-impermeable membrane to the exterior of the roof to prevent water from penetrating the roof while it remains damaged, also known as the blue tarp method. These approaches, however, are difficult and time-consuming to implement. The current approaches to the problem of applying a temporary membrane to a damaged roof do not address the issue of properly fitting the membrane to the roof size and shape. The current approaches also do not address

the issue of fastening the ends or the perimeter of the membrane to the roof. Improper fitting of the membrane to the size and shape of the roof can result in a membrane that can be removed by strong winds or permit water to enter in between the membrane and the roof. Additionally, improper fastening of the ends, or perimeter of, the membrane, can result in a membrane that is too easily removed and allows water penetration. For these reasons, the current approaches to the problem of applying a temporary membrane to a damaged roof are inadequate.

Additionally, the current approaches to the problem of applying a temporary membrane to a damaged roof, including the blue tarp method, add holes to the top of the roof, which can cause further water leakage into the structure, and only last for up to 90 days. In fact, the Federal Emergency Management Agency, FEMA, even categorizes the blue tarp method as only a 30-day solution. Therefore, the current approaches to the problem of applying a temporary membrane to a damaged roof are temporary at best.

Therefore, a need exists to overcome the problems with the prior art as discussed above, and particularly for a more efficient way of applying temporary remedial or protective measures onto a damaged roof.

SUMMARY

A system and method for temporary protection of a damaged roof is provided. This Summary is provided to introduce a selection of disclosed concepts in a simplified form that are further described below in the Detailed Description including the drawings provided. This Summary is not intended to identify key features or essential features of the claimed subject matter. Nor is this Summary intended to be used to limit the claimed subject matter's scope.

In one embodiment, a system and method for temporary protection of a damaged roof is provided that solves the above-described problems. The system and method for covering at least a portion of a roof with an impermeable membrane comprises a method that includes placing a strip of the impermeable membrane over a subset of the portion of the roof intended to be covered, cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered, fastening a flexible, elongated band of material to the end of the strip using a plurality of first fasteners, rolling the band of material at least one half turn in the end of the strip, attaching the band of material that was rolled in the end of the strip to a fascia of eaves of the roof using a plurality of second fasteners, and repeating the steps above until the portion of the roof is covered in the impermeable membrane.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. In the drawings:

FIG. **1** is an illustration of a perspective view of a residential structure with a damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **2** is an illustration of a close-up perspective view of the residential structure with the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **3** is an illustration showing construction material in the process of being wrapped in the impermeable mem-

brane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **4** is an illustration showing construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **5** is an illustration showing a cross-sectional view of construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **6** is an illustration showing two strips of the impermeable membrane being fastened together using heat, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **7** is an illustration showing two strips of the impermeable membrane being fastened together using a roller device, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **8** is an illustration of a perspective view of the residential structure with a damaged roof, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment.

FIG. **9** is another illustration showing construction material in the process of being wrapped in the impermeable membrane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **10** is another illustration showing construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **11** is another illustration showing a cross-sectional view of construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **12** is another illustration of a perspective view of the residential structure with a damaged roof, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment.

FIG. **13** is an illustration showing how an end of the strip of membrane is cut, according to an example embodiment.

FIG. **14** is an illustration showing an alternative construction material for the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

DETAILED DESCRIPTION

The following detailed description refers to the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the following description to refer to the same or similar elements. While embodiments of the claimed subject matter may be described, modifications, adaptations, and other implementations are possible. For example, substitutions, additions, or modifications may be made to the elements illustrated in the drawings, and the methods described herein may be modified by substituting, reordering, or adding stages to the disclosed methods. Accordingly, the following detailed description does not limit the claimed subject matter. Instead, the proper scope of the claimed subject matter is defined by the appended claims.

The claimed subject matter improves over the prior art by providing an economic, user-friendly and effective way of temporarily protecting a damaged roof, and the contents of the structure, from further damage. The claimed subject matter is further easy to learn for workers and time-saving to implement. The claimed subject matter further improves over the prior art by properly fitting the membrane to the roof size and shape and properly fastening the ends or the perimeter of the membrane to the roof. Proper fitting of the membrane to the size and shape of the roof results in a membrane that cannot be removed by strong winds or permit water to enter in between the membrane and the roof. Additionally, proper fastening of the ends, or perimeter of, the membrane, results in a membrane that is not easily removed and does not allow water penetration. Furthermore, the claimed subject matter does not introduce additional holes into the damaged roof and is a more than a temporary solution, as it can persist for periods of time longer than 90 days.

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. The claimed system and method for temporary protection of a damaged roof will now be described with respect to FIGS. **1** through **8**. FIG. **1** is an illustration of a perspective view of a residential structure **100** with a damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **1** shows that the proposed system and method includes the application of an impermeable membrane to the damaged roof.

The proposed system utilizes a water impermeable membrane that may shrink when heat is applied. Namely, when heat is applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. The water impermeable membrane may be used in a variety of thicknesses, clarities, strengths and shrink ratios. The water impermeable membrane may comprise polyolefin and may be a material made up of polymer plastic film. Polyolefin is a type of polymer produced from a simple olefin (also called an alkene) as a monomer. Other examples of materials used for the water impermeable membrane include PVC, polyethylene, polypropylene, EP/EVA/copolyester/EVA/EP (where EP is ethylene-propylene and EVA is ethylene-vinyl acetate copolymer) and other compositions.

The water impermeable membrane may be provided in rolls **110** of a certain width. In one embodiment, each roll **110** of the water impermeable membrane comprises a width of about 24 to 42 inches, with each roll provided from about 40 feet to about 120 feet of length of the water impermeable membrane. FIG. **1** shows that several rolls **110** of the impermeable membrane have been placed on top of the damaged roof **102** of the residential structure **100**. Each roll **110** is unrolled on top of the damaged roof **102** in the same direction and the sides of each unrolled strip of impermeable

membrane are placed adjacent to another unrolled strip of impermeable membrane, such that the sides of each unrolled strip are coupled with the sides of the unrolled strips adjacent, as described more fully below.

In one alternative embodiment, strips, or portions of, the rolls **110** are cut from the roll before they are placed on top of the damaged roof **102** of the residential structure **100**. In this embodiment, a length of impermeable membrane is cut from the roll, and subsequently placed on top of the damaged roof **102** of the residential structure **100**. In this embodiment, workers measure the length of impermeable membrane needed for the roof, and subsequently, said measured length of impermeable membrane is cut from the roll, and then placed on top of the damaged roof **102** of the residential structure **100**.

FIG. **2** is an illustration of a close-up perspective view of the residential structure **100** with the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **2** shows multiple rolls **110** of the impermeable membrane have been placed on top of the damaged roof **102** of the residential structure **100** in order to protect said roof, and the contents of the residential structure **100**, from further damage or decay from precipitation, wind, etc. FIG. **2** shows that each roll **110** is unrolled, either fully or partially, on top of the damaged roof **102** in the same direction. FIG. **2** also shows that the sides of each unrolled strip **202** of impermeable membrane are placed adjacent to another unrolled strip **204** of impermeable membrane. More specifically, FIG. **2** shows that the sides of each unrolled strip **202** of impermeable membrane are placed so as to overlap (by about 3 to 8 inches) with the sides of the adjacent unrolled strip **204** of impermeable membrane. In one embodiment, each unrolled strip **202** of impermeable membrane are placed so as to overlap with the sides of the adjacent unrolled strip **204** of impermeable membrane by exactly 3 inches. Subsequently, the sides of each unrolled strip are coupled with the sides of the unrolled strips adjacent, as described more fully below. Again, in one alternative embodiment, strips, or portions of, the rolls **110** are cut from the roll before they are placed on top of the damaged roof **102** of the residential structure **100**.

FIG. **3** is an illustration showing construction material **302** in the process of being wrapped in the impermeable membrane **304**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. In FIG. **3**, the construction material **302** is a piece of lumber, which is a type of wood that has been processed into beams and planks. A plank, i.e., a wood plank or plank of wood, is timber that is flat, elongated, and rectangular with parallel faces that are higher and longer than wide. Planks are usually more than 1½ in (38 mm) thick and are generally wider than 2½ in (64 mm). Planks can be any length and are generally a minimum of 2 in (51 mm) deep by 8 in (200 mm) wide, but planks that are 2 in (51 mm) by 10 in (250 mm) and 2 in (51 mm) by 12 in (300 mm) are more common. In one embodiment, the construction material **302** is a wood plank that measures 2 in×4 in, 2 in×6 in, 2 in×8 in, or 2 in×12 in. In one embodiment, the construction material **302** is a wood plank that measures 1'×2'×8'.

In other embodiments, the construction material **302** may be other items, such as portions of metal siding, portions of roof tile, etc. FIG. **3** shows the roll **110** of impermeable membrane has been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves of the damaged roof **102** of the residential structure. FIG. **3** shows that the end of the unrolled strip **202** (which was rolled around the construction material **302**) has been attached to the construction material **302** via one or more fasteners **309**, which is a staple. In one embodiment, T50 ⅜' galvanized steel staples are placed 4 inches apart on the end of the unrolled strip **202**. In another embodiment, exactly 24 staples are placed on the end of the unrolled strip **202** per instance (or plank) of construction material **302**, so as to attach the unrolled strip to the construction material. Other types of fasteners may be used to attach the construction material **302** to the end of the unrolled strip **202**, such as nails, clips, screws, etc. Also, adhesive may be used to attach the construction material **302** to the end of the unrolled strip **202**. FIG. **3** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202** in a clockwise **319** direction so that the open end of the roll faces downwards.

In an alternative embodiment, the construction material **302** is a flexible piece of plastic strip **1400** that is available in a coiled form in 50-foot coils (see FIG. **14**). The plastic, which may be regrind plastic, is uncoiled for use as the construction material for attaching to the roof. The plastic strip **1400** may be a flexible, elongated band of material. The plastic strip is wrapped in the end of the unrolled strip **202** as described above, and the unrolled strip is attached to the plastic strip as described above. Said plastic strip is smaller than wood planks, easier to store, flexible for use in different shapes and allows work crews to work more efficiently. In one alternative embodiment, the plastic strip is not wrapped in the end of the unrolled strip **202**, as described above, rather, the outward edge of the end of the unrolled strip **202** is attached to the plastic strip either using adhesive tape, adhesive or using a fastener **309**, as described above.

FIG. **4** is an illustration showing construction material **302** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **4** shows the roll **110** of impermeable membrane had been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves **409** of the damaged roof **102**, so as to be applied to the construction material **302**. FIG. **4** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **409** of the damaged roof **302**. Note that the construction material **302** is attached to the vertical, outward-facing fascia **408** of the eaves of the roof. In one embodiment, each instance of the construction material **302** is spaced 4 inches apart from the next instance of the construction material on the fascia **408** of the eaves of the roof, around the entire perimeter of the roof. Through testing, the applicant discovered that less than 4 inches would result in a roof not being properly vented and more than 4 inches would not be secure (waterproof) enough.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, the plastic is uncoiled for use as the construction material for attaching to the roof, and the plastic strip is attached to the vertical, outward-facing fascia **408** of the eaves of the roof as described above.

FIG. **4** shows the construction material **302** is attached to the vertical, outward-facing fascia **408** of the eaves of the roof. In another alternative embodiment, the construction material **302** may be attached to the top of the roof **130** (see FIG. **1**), the downward facing surface **131** under the eaves of the roof, or the vertical wall **132** supporting the roof. In these alternative embodiments, the construction material **302** may

be attached using fasteners **502** (or their equivalent, as described below), adhesive tape or simply adhesive.

FIG. **5** is an illustration showing a cross-sectional view of construction material **302** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **5** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **409** of the damaged roof **102**. The construction material **302** may be wrapped such that the end of the unrolled strip **302** completely surrounds the construction material 1 time, 2 times, or 3-4 times. I.e., in one embodiment, construction material **302** is wrapped 1 time, 2 times, or 3-4 times in the end of the unrolled strip. In another embodiment, the construction material **302** may be wrapped such that the end of the unrolled strip **302** is wrapped one half turn around the construction material (i.e., it surrounds 180 degrees of the outside perimeter of the cross section of the construction material).

FIG. **5** shows that the end of the unrolled strip **202** (after wrapping the construction material **302**) has been attached to the construction material **302** via a fastener **309**, which is a staple. FIG. **5** further shows that the construction material **302** and the end of the unrolled strip **202** (which wraps around the construction material **302**) has been attached to the eaves **409** of the roof via one or more fasteners **502**, which is a nail. Other types of fasteners may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof, such as clips, screws, etc. Also, adhesive may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof. Further, adhesive tape may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof. In one embodiment, the fastener **502** is a #10 3-inch polymer-coated exterior screw placed every 16 inches along the length of the construction material **302** and the end of the unrolled strip **202**, so as to attach the construction material **302** and the end of the unrolled strip **202** to the fascia **408** or to the portions **130**, **131** or **132** of the structure. If the fascia **408** (or to the portions **130**, **131** or **132** of the structure) consists of concrete, brick or block, then the fastener **502** is a ¼"×2¾" concrete anchor placed every 16 inches along the length of the construction material **302**, so as to attach the construction material **302** and the end of the unrolled strip **202** to the fascia **408** or to the portions **130**, **131** or **132** of the structure. In one embodiment, the fastener **502** is a 3"×0.120 galvanized nail deployed with a nail gun and placed every 16 inches along the length of the construction material **302** and the end of the unrolled strip **202**, so as to attach the construction material **302** and the end of the unrolled strip **202** to the fascia **408** or to the portions **130**, **131** or **132** of the structure. In another embodiment, exactly 6 nails or screws are placed along the length of the construction material **302** and the end of the unrolled strip **202**, so as to attach the construction material **302** and the end of the unrolled strip **202** to the fascia **408** or to the portions **130**, **131** or **132** of the structure.

In one embodiment, the method or process of attaching the ends of the unrolled strip **202** to the eaves of the damaged roof **102** occurs as follows. A first unrolled strip of the impermeable membrane is draped over the roof **102**, wherein the end of the strip overhangs the eaves of the roof. Then, a wood plank is placed horizontally under the end of the strip that overhangs the eaves of the roof, such that the wood plank is placed below the eaves of the roof. The wood plank is placed far enough below the eaves of the roof such that when the wood plank is rolled up in the end of the strip (described below), the wood plank is at the height of the fascia of the eaves of the roof. Next, the left and right sides of the strip are cut vertically such that the strip is coextensive with a length of the wood plank. The end of the strip is also cut horizontally below the wood plank. That is, assuming the wood plank is placed horizontally so that it is parallel with the fascia of the eaves of the roof, a vertical cut is placed in the end of the strip on the left of the wood plank, a vertical cut in placed in the end of the strip on the right of the wood plank, and a horizontal cut is placed in the end of the strip below the wood plank.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip (wherein the plastic is uncoiled for use as the construction material for attaching to the roof, and the plastic strip is attached to the vertical, outward-facing fascia **408** of the eaves of the roof), the plastic strip is placed horizontally under the end of the membrane strip that overhangs the eaves of the roof, such that the plastic strip is placed below the eaves of the roof. The plastic strip is placed far enough below the eaves of the roof such that when the plastic strip is rolled up in the end of the membrane strip (described below), the plastic strip is at the height of the fascia of the eaves of the roof. The left and right sides of the membrane strip are not necessarily cut vertically. The end of the membrane strip may be cut horizontally below the plastic strip. That is, assuming the plastic strip is placed horizontally so that it is parallel with the eaves of the roof, a horizontal cut is placed in the end of the membrane strip below the plastic strip. There is no need to cut the membrane strip vertically because the plastic strip may be extended beyond the left and right edges of the membrane strip.

In another alternative embodiment where the construction material **302** is a flexible piece of plastic strip **1400** (wherein the plastic is uncoiled for use as the construction material for attaching to the roof, and the plastic strip is attached to the vertical, outward-facing fascia **408** or to the portions **130**, **131** or **132** of the structure), the plastic strip is placed horizontally under the end of the membrane strip. The left and right sides of the membrane strip are not necessarily cut vertically. The end of the membrane strip may be cut horizontally below the plastic strip. That is, assuming the plastic strip is placed horizontally so that it is parallel with the end of the membrane strip, a horizontal cut may or may not be placed in the end of the membrane strip below the plastic strip. There is no need to cut the membrane strip vertically because the plastic strip may be extended beyond the left and right edges of the membrane strip. Then, the end of the membrane strip may be attached to the plastic strip using a fastener, adhesive tape or simply adhesive. Subsequently, the construction material **302** is attached to fascia **408** or to the portions **130**, **131** or **132** of the structure.

Returning to the wood plank embodiment, the wood plank is fastened to the end of the strip using a plurality of staples. Next, the wood plank is rolled one half turn (180 degree turn), one full turn (360 degrees), two full turns (720 degrees), or three full turns in the end of the strip, such that the wood plank is at a height of the fascia of the eaves of the roof. Then, the wood plank that was rolled in the end of the strip is attached to the fascia of the eaves of the roof using a plurality of nails. Further, each strip of the impermeable membrane that has been draped over the roof is placed such that it overlaps at least three inches with each adjacent strip of the impermeable membrane that has been draped over the

roof. The steps above are repeated until the entire roof is covered in the impermeable membrane. Finally, heat is applied using a heat source to a portion of each strip that overlaps an adjacent strip, so as to meld the portion of each strip with the adjacent strip (as described more fully below). Also, heat may be applied using a heat source to all or a portion of the impermeable membrane on the roof, so as to shrink the membrane for aerodynamic purposes (to reduce or eliminate the membrane blowing off in a wind) and for hydrodynamic purposes to aid in water running or falling off the roof.

FIG. **6** is an illustration showing two strips **602**, **604** of the impermeable membrane being fastened together using heat, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. Recall that the water impermeable membrane that may shrink when heat is applied. Namely, when heat is applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. FIG. **6** shows that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane are placed such that that the sides of each strip overlap (by about 3 to 8 inches) with the sides of the adjacent strip of impermeable membrane. Subsequently, heat is applied to the overlapping portion of the sides of each strip using a blowtorch or other heat device **610**. As a result, the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane are melded together, thereby producing a seam that is also water impermeable.

FIG. **7** is an illustration showing two strips **602**, **604** of the impermeable membrane being fastened together using a roller device **702**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **7** shows that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane were placed such that that the sides of each strip overlap and heat was applied to the overlapping portion so that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane were melded together, thereby producing a seam that is also water impermeable. FIG. **7** shows that a roller **702** is applied to the overlapping portion or seam so as to secure the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane together. The roller **702** may comprise a cylinder **704** that rotates as it rolls over the overlapping portion, thereby patting down any bubbles or undulations in the overlapping portion. The purpose of applying the roller **702** is to flatten the overlapping portion or seam as much as possible, resulting in a stronger seam and a flatter surface that optimizes water runoff.

The roller **702** may comprise leather that has been placed over the cylinder **704**. A Kevlar thread may be used to sew the leather onto the cylinder **704** of the roller **702**. Said roller cover withstands high heat and allows users to fuse the sides or seams of the strips **602**, **604** together.

FIG. **8** is an illustration of a perspective view of the residential structure **100** with a damaged roof **102**, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment. FIG. **8** shows that multiple rolls **110** of the impermeable membrane have been draped on top of the damaged roof **102** of the residential structure **100** in the same direction and the sides of each unrolled strip of impermeable membrane have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof is covered in the impermeable membrane. Finally, sandbags may be placed on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof. FIG. **8** shows that the construction material **302** on the eaves of the roof has been wrapped in the end of the unrolled strip **202** in a clockwise direction so that the open end of the roll faces downwards. This reduces or eliminates the pooling of water in the open end of the roll.

Said process described above for waterproofing a structure can also be used to provide wall insulation for a wall of a structure, to provide dust barriers for a structure, to provide waterproofing of a structure during construction, to provide waterproofing of a structure under construction that is lacking exterior windows, doors and walls, and for containment of the interior of buildings. Said process described above for waterproofing a structure can also be used to provide a separation in the interior of buildings or warehouses for smaller temporary rooms for security or temperature control.

Note that although FIG. shows the entire top of the roof of the structure has been completely covered by the impermeable membrane, the claimed embodiments support a process wherein only a predetermined portion, or subset, of the top of the roof of the structure has been covered by the impermeable membrane. This embodiment works in cases where only a portion of the roof has been damaged, and saves the time and expense of covering the entire roof, which may not be necessary.

FIG. **9** is another illustration showing construction material **902** in the process of being wrapped in the impermeable membrane **304**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. In FIG. **9**, the construction material **902** is rolled in the end of the unrolled strip **202** in a counterclockwise direction **919** so that an open end of the roll faces upwards. FIG. **9** shows the roll **110** of impermeable membrane has been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves of the damaged roof **102** of the residential structure. FIG. **9** shows that the end of the unrolled strip **202** (which was rolled around the construction material **902**) has been attached to the construction material **902** via a fastener **309**, which is a staple.

FIG. **10** is an illustration showing construction material **902** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. Note that the construction material **902** is attached to the vertical, outward-facing fascia of the eaves of the roof. FIG. **10** shows that the construction material **902** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves of the damaged roof **102**.

In the event that attachment of the construction material **902** can't be made below the eaves of the roof, sandbags may be placed at the edge of the roof surface. Sandbags may be placed approximately 4-6' inside the edge of the strip of impermeable membrane **304** from the edges of the roof. The end of the strip of impermeable membrane **304** may be folded over the sandbags and the end of the strip of impermeable membrane **304** may be heat treated (as shown in FIG. **6**), therefore encapsulating the sandbags. Sandbags

may be placed every 15-20'. Once heated, the sandbags may be rolled one additional time on to itself to provide added support.

FIG. **11** is an illustration showing a cross-sectional view of construction material **902** completely wrapped in the impermeable membrane **304** and attached to the fascia of the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **11** shows that the construction material **902** has been wrapped in the end of the unrolled strip **202** in a counterclockwise direction so that the open end of the roll faces upwards. The construction material **902** may be wrapped such that the end of the unrolled strip **202** completely surrounds the construction material 1-time, 2-times or, alternatively, 3-4 times. I.e., in one embodiment, construction material **902** is wrapped 1-time, 2-times or, alternatively, 3-4 times in the end of the unrolled strip. FIG. **11** shows that the end of the unrolled strip **202** (after wrapping the construction material **902**) has been attached to the construction material **902** via a nail **502**.

FIG. **12** is another illustration of a perspective view of the residential structure **100** with a damaged roof **102**, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment. FIG. **12** shows that multiple rolls **110** of the impermeable membrane have been draped on top of the damaged roof **102** of the residential structure **100** in the same direction and the sides of each unrolled strip of impermeable membrane have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof is covered in the impermeable membrane. FIG. **12** shows that the construction material **902** on the eaves of the roof has been wrapped in the end of the unrolled strip **202** in a counterclockwise direction so that the open end of the roll faces upwards.

FIG. **13** is an illustration showing how an end of the strip of membrane is cut, according to an example embodiment. In one embodiment, the method or process of attaching the ends of the unrolled strip **1304** to the eaves of the damaged roof **102** occurs as follows. A first unrolled strip **1304** of the impermeable membrane **1302** is draped over the roof **102**, wherein the end of the strip overhangs the eaves of the roof. Then, a wood plank **1306** is placed horizontally under the end of the strip **1304** that overhangs the eaves of the roof, such that the wood plank is placed below the eaves of the roof. The wood plank is placed far enough below the eaves of the roof such that when the wood plank is rolled up in the end of the strip, the wood plank is at the height of the eaves of the roof.

Next, the right side of the strip **1304** is cut (using a cutting device, such as scissors **1320**) vertically along a line **1314** to substantially match the length of the wood plank **1306**. Said cut on the right side of the strip **1304** may be 6 inches long and may be placed at least one inch from the right side of the plank **1306**. Also, the left side of the strip **1304** is cut vertically along a line **1312** to substantially match the length of the wood plank **1306**. Said cut on the left side of the strip **1304** may be 6 inches long and may be placed at least one inch from the left side of the plank **1306**. Next, the end of the strip **1304** is cut horizontally along a line **1310** below the wood plank **1306**. Said cut may be placed flush with the bottom of the plank **1306**, or may be placed at least one inch from the bottom of the plank **1306**. Then, the wood plank is rolled in the strip **1304** as described above. Subsequently, the wood plank is fastened to the end of the strip using a plurality of staples. Next, the wood plank is rolled one half turn, one full turn, two full turns, or three full turns in the end of the strip, such that the wood plank is at a height of the eaves of the roof. Then, the wood plank that was rolled in the end of the strip is attached to the eaves of the roof using a plurality of nails.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, the plastic strip is placed horizontally under the end of the membrane strip that overhangs the eaves of the roof, such that the plastic strip is placed below the eaves of the roof. The plastic strip is placed far enough below the eaves of the roof such that when the plastic strip is rolled up in the end of the membrane strip (described below), the plastic strip is at the height of the fascia of the eaves of the roof. The left and right sides of the membrane strip are not necessarily cut vertically. The end of the membrane strip may be cut horizontally below the plastic strip. That is, assuming the plastic strip is placed horizontally so that it is parallel with the eaves of the roof, a horizontal cut is placed in the end of the membrane strip below the plastic strip. There is no need to cut the membrane strip vertically because the plastic strip may be extended beyond the left and right edges of the membrane strip.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, a high-rise building attachment method is also disclosed. The process may begin on the second floor of the building, wherein a 2×4 wood plank is attached on an outside edge. Enough impermeable membrane is rolled out to extend to the bottom floor f the building with an extra door to make attachments. The flexible plastic strip is unrolled and attached to the outer most portion of the 2×4 using 2" screws. Then, the impermeable membrane is unrolled to the 1st floor. Next, on the 3rd floor of the building, a 2×4 wood plank is attached on an outside edge. Impermeable membrane is attached to the 3^{rd} floor and unrolled to the second floor. The flexible plastic strip is unrolled and attached to the outer most portion of the 2×4 of the 3^{rd} floor using 2" screws. Then, the impermeable membrane is unrolled to the 2nd floor. The ends of the impermeable membrane on the 2^{nd} floor are attached to the outer most portion of the 2×4 using 2" screws. This process is repeated for the entire high-rise.

Embodiments may be described above with reference to functions or acts, which comprise methods. The functions/acts noted above may occur out of the order as shown or described. For example, two functions/acts shown or described in succession may in fact be executed substantially concurrently or the functions/acts may sometimes be executed in the reverse order, depending upon the functionality/acts involved. While certain embodiments have been described, other embodiments may exist. Further, the disclosed methods' functions/acts may be modified in any manner, including by reordering functions/acts and/or inserting or deleting functions/acts, without departing from the spirit of the claimed subject matter.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A method for covering at least a portion of a roof with an impermeable membrane, comprising:

a) placing a strip of the impermeable membrane over the portion of the roof intended to be covered;

b) cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered;

c) fastening a flexible, elongated band of material to the end of the strip using a plurality of first fasteners;

d) rolling the band of material at least one half turn in the end of the strip;

e) attaching the band of material that was rolled in the end of the strip to a fascia of eaves of the roof using a plurality of second fasteners; and

f) repeating steps a) through e) until the portion of the roof is covered in the impermeable membrane.

2. The method of claim **1**, further comprising:

h) overlapping at least three inches of a first strip of the impermeable membrane that has been placed over the roof with a second strip of the impermeable membrane that has been placed over the roof.

3. The method of claim **2**, further comprising:

i) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to shrink the first strip and the second strip.

4. The method of claim **3**, further comprising:

j) placing sandbags on top of the impermeable membrane that has been placed over the roof, in order to hold the impermeable membrane on top of the roof.

5. The method of claim **4**, wherein the flexible, elongated band of material comprises a plastic.

6. The method of claim **5**, wherein the first fasteners comprise staples.

7. The method of claim **6**, wherein the second fasteners comprise nails.

8. A method for covering at least a portion of a roof with an impermeable membrane, comprising:

a) placing a strip of the impermeable membrane over a subset of the portion of the roof;

b) cutting a length of the strip to accommodate a size of the portion of the roof;

c) fastening a rigid, elongated band of material to the end of the strip using adhesive;

d) rolling the band of material at least one half turn in the end of the strip;

e) attaching the band of material that was rolled in the end of the strip to a side of the roof using a plurality of fasteners; and

f) repeating steps a) through e) until the portion of the roof is covered in the impermeable membrane.

9. The method of claim **8**, further comprising:

h) overlapping at least three inches of a first strip of the impermeable membrane that has been placed over the roof with a second strip of the impermeable membrane that has been placed over the roof.

10. The method of claim **9**, further comprising:

i) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to shrink the first strip and the second strip.

11. The method of claim **10**, further comprising:

j) placing sandbags on top of the impermeable membrane that has been placed over the roof, in order to hold the impermeable membrane on top of the roof.

12. The method of claim **4**, wherein the flexible, elongated band of material comprises a plastic.

13. A method for covering at least a portion of a roof with an impermeable membrane, comprising:

a) placing a strip of the impermeable membrane over a subset of the portion of the roof;

b) cutting a length of the strip to accommodate a size of the portion of the roof;

c) fastening a flexible, elongated band of material to the end of the strip using a plurality of first fasteners;

d) rolling the band of material at least one half turn in the end of the strip;

e) attaching the band of material that was rolled in the end of the strip to a top of the roof using adhesive; and

f) repeating steps a) through e) until the portion of the roof is covered in the impermeable membrane.

14. The method of claim **13**, further comprising:

h) overlapping at least three inches of a first strip of the impermeable membrane that has been placed over the roof with a second strip of the impermeable membrane that has been placed over the roof.

15. The method of claim **14**, further comprising:

i) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to shrink the first strip and the second strip.

16. The method of claim **15**, further comprising:

j) placing sandbags on top of the impermeable membrane that has been placed over the roof, in order to hold the impermeable membrane on top of the roof.

17. The method of claim **16**, wherein the flexible, elongated band of material comprises a plastic.

18. The method of claim **17**, wherein the first fasteners comprise staples.

19. The method of claim **18**, wherein the second fasteners comprise nails.

* * * * *

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(12) **United States Patent**
Mouriz et al.

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(45) **Date of Patent: *Jun. 22, 2021**

(54) **METHOD FOR COVERING ROOF WITH SHRINK WRAP**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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E04D 5/14 (2006.01)
E04G 21/24 (2006.01)

(52) **U.S. Cl.**
CPC ***E04D 5/142*** (2013.01); ***E04G 21/24*** (2013.01); *E04D 5/144* (2013.01); *E04G 2021/248* (2013.01)

(58) **Field of Classification Search**
CPC E04D 5/146; E04D 5/142; E04D 15/04; E04D 5/06; E04D 2015/042
See application file for complete search history.

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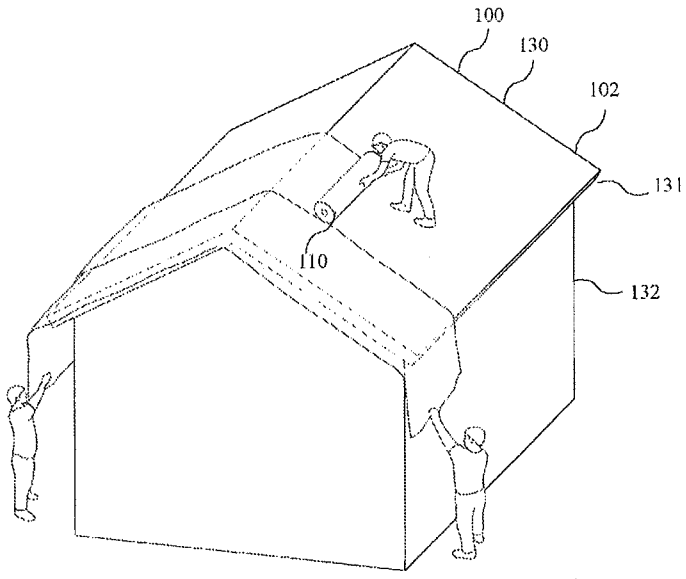
(57) **ABSTRACT**

A system and method for temporary protection of a damaged roof is provided. The system and method for covering at least a portion of a roof with an impermeable membrane comprises a method that includes placing a strip of the impermeable membrane over the portion of the roof intended to be covered, cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered, draping an end of the strip over a fascia of eaves of the roof, placing elongated construction material on the end of the strip contacting fascia of eaves of the roof, attaching the elongated construction material to the fascia of eaves of the roof using a plurality of fasteners, and repeating the steps above until the portion of the roof is covered in the impermeable membrane.

13 Claims, 11 Drawing Sheets



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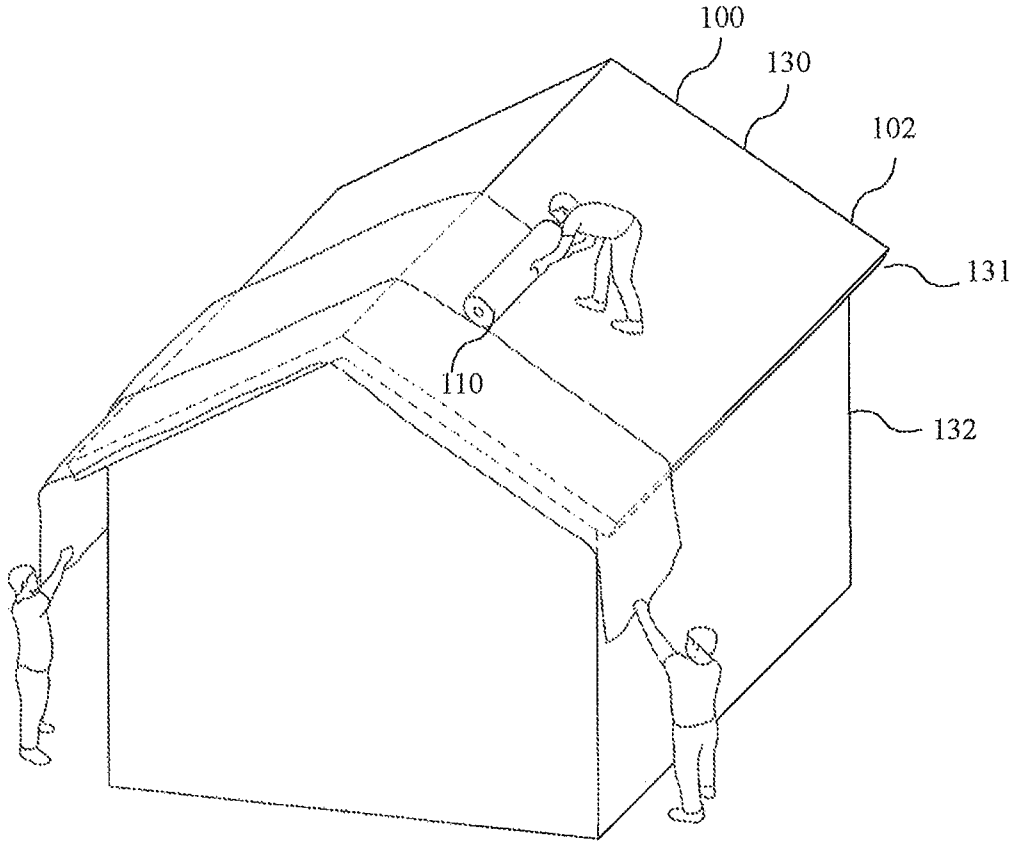


Fig. 1

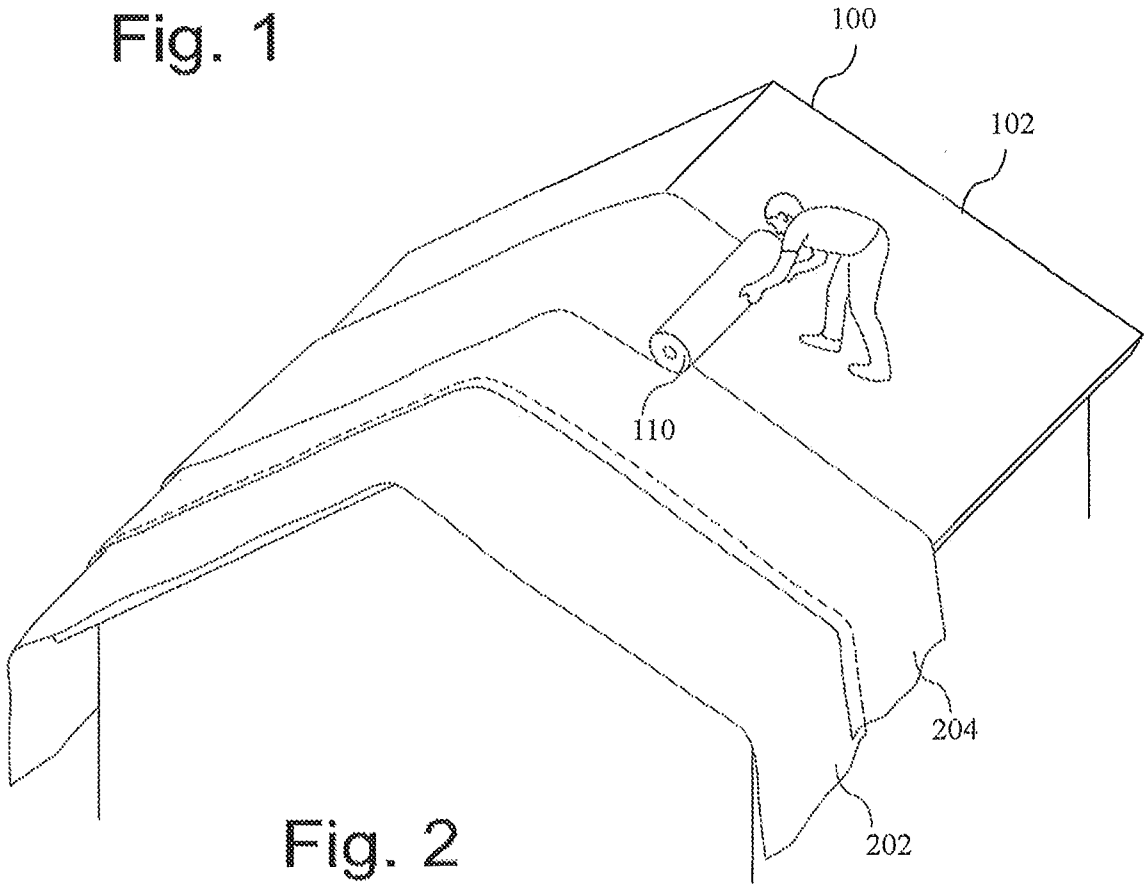


Fig. 2

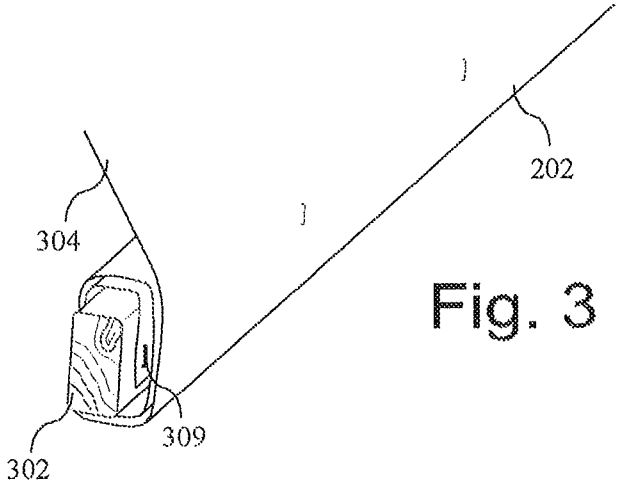


Fig. 3

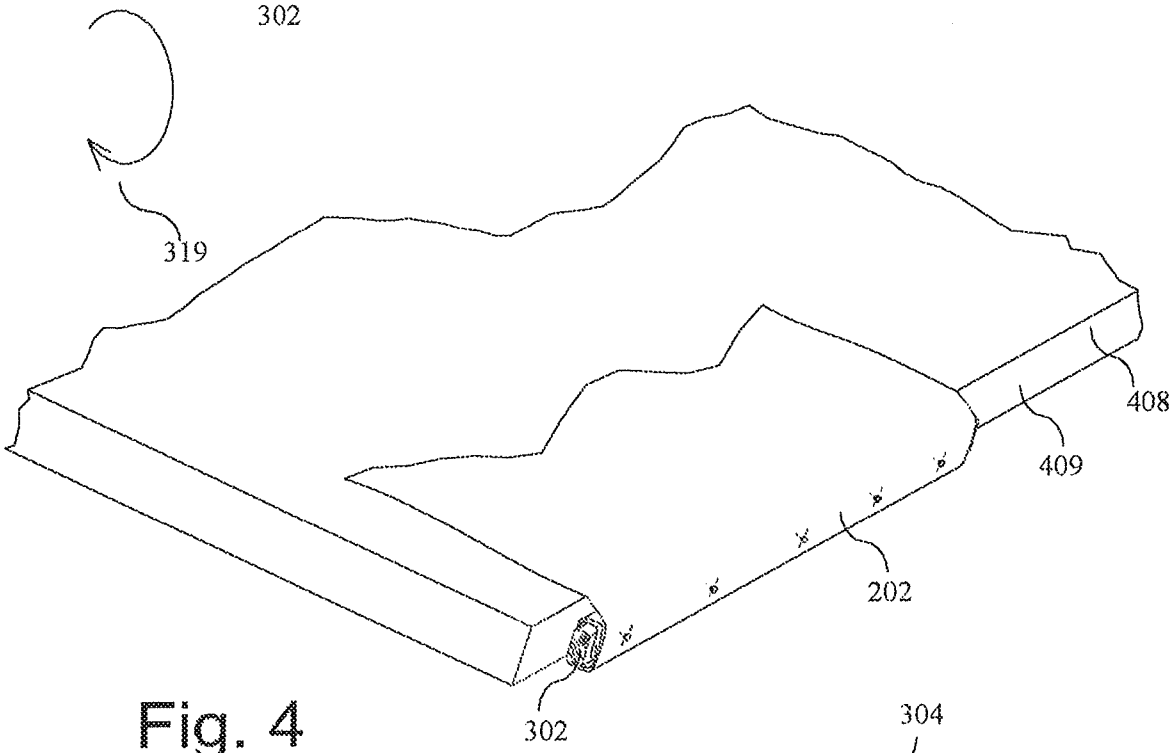


Fig. 4

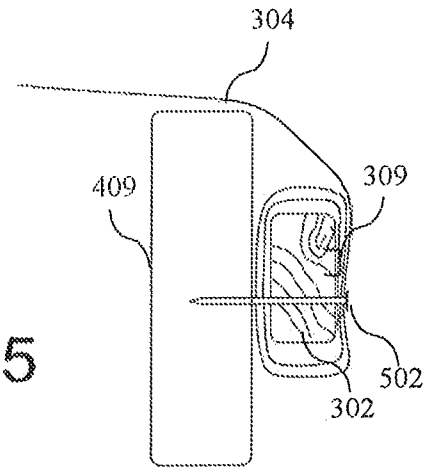


Fig. 5

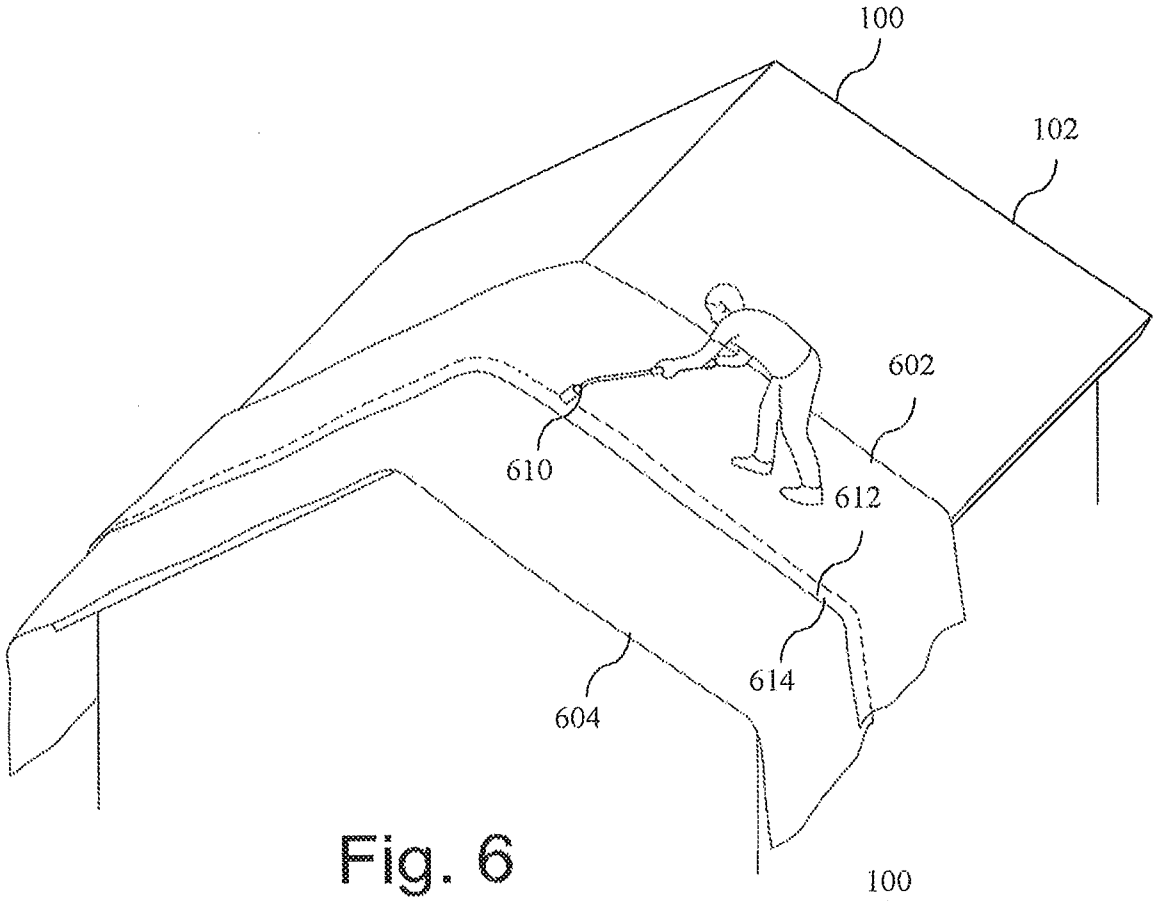


Fig. 6

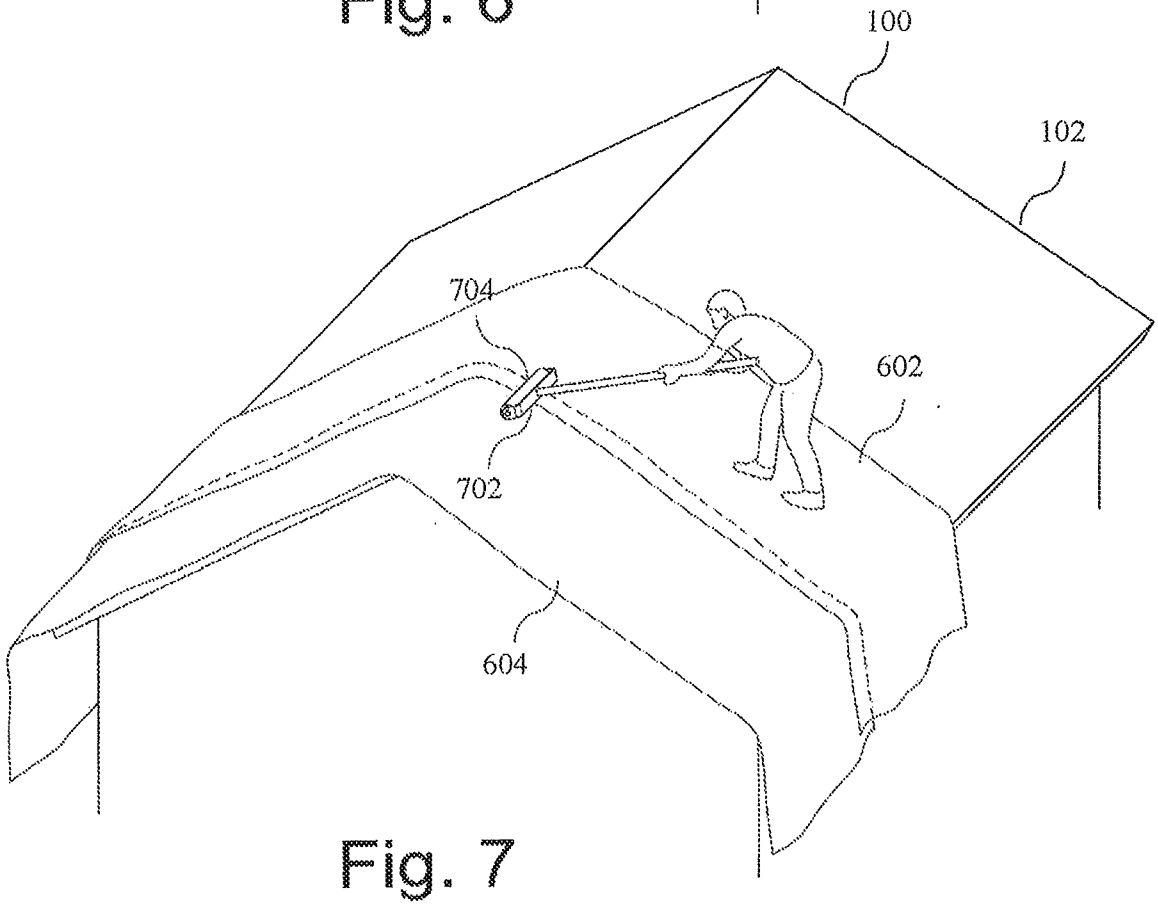


Fig. 7

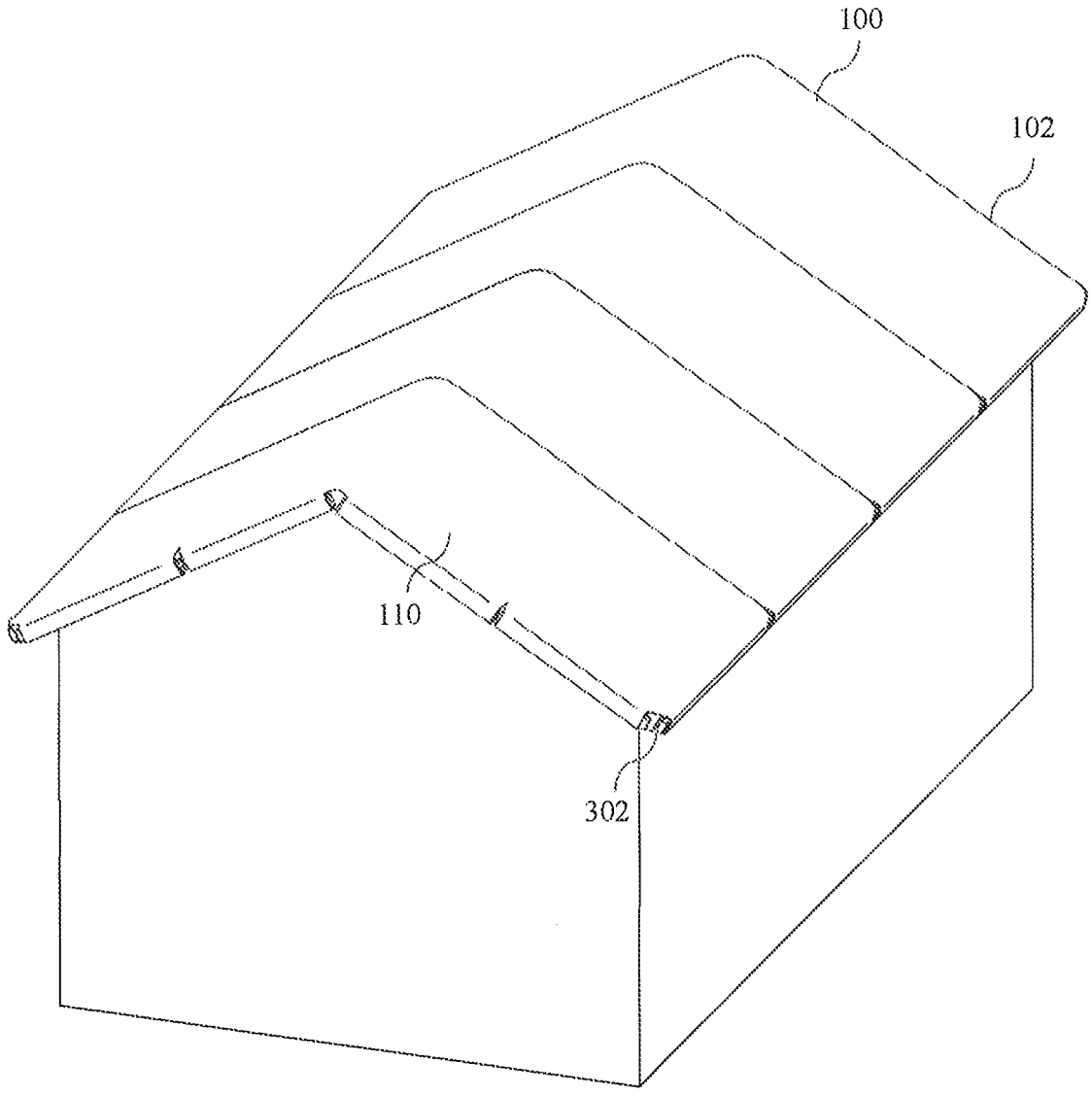


Fig. 8

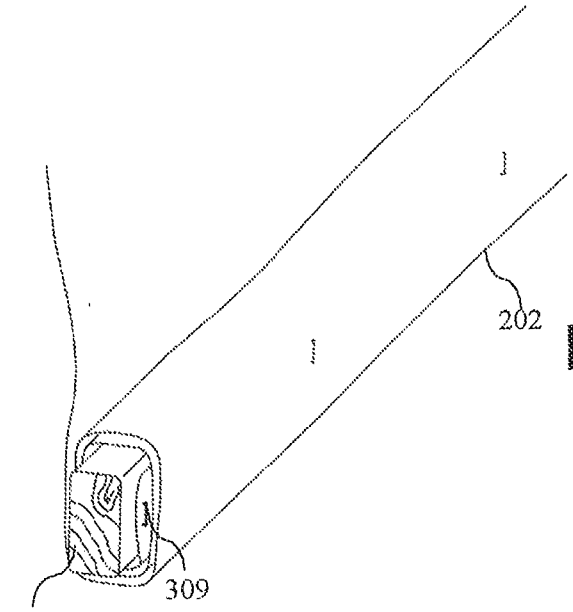


Fig. 9

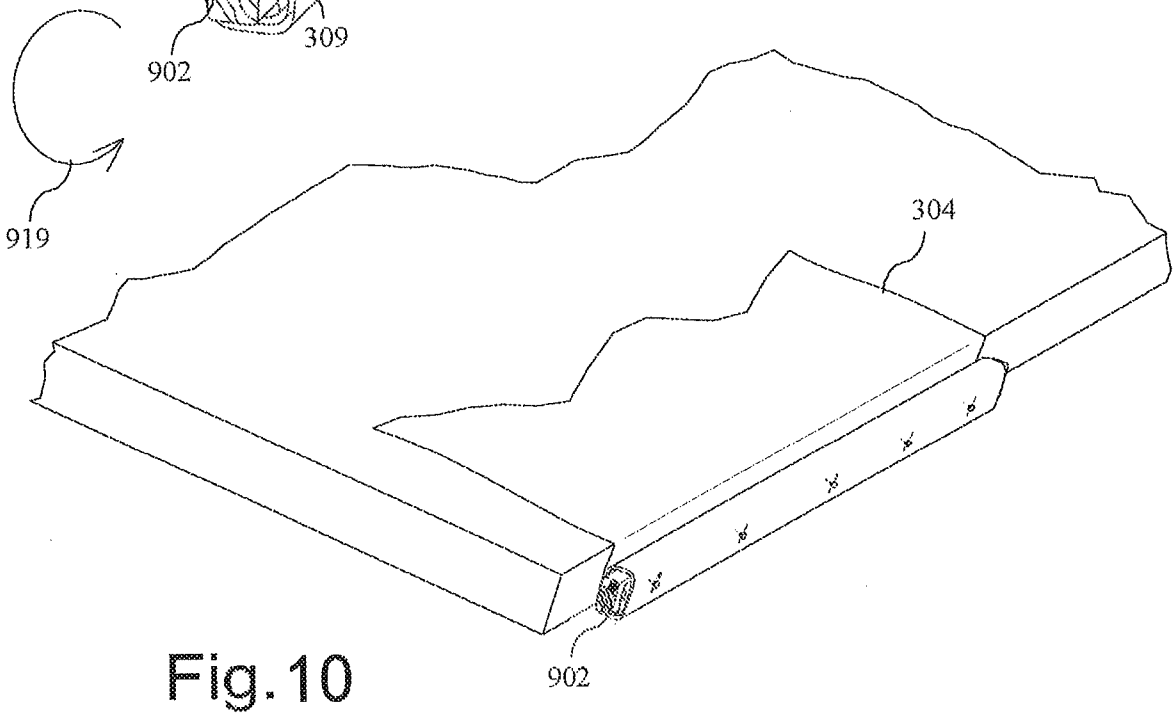


Fig. 10

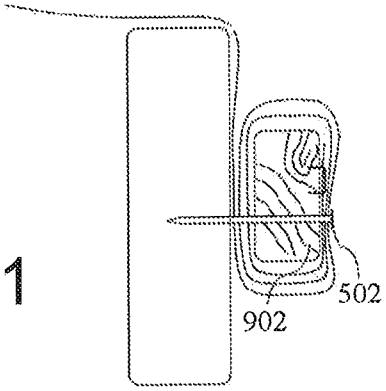


Fig. 11

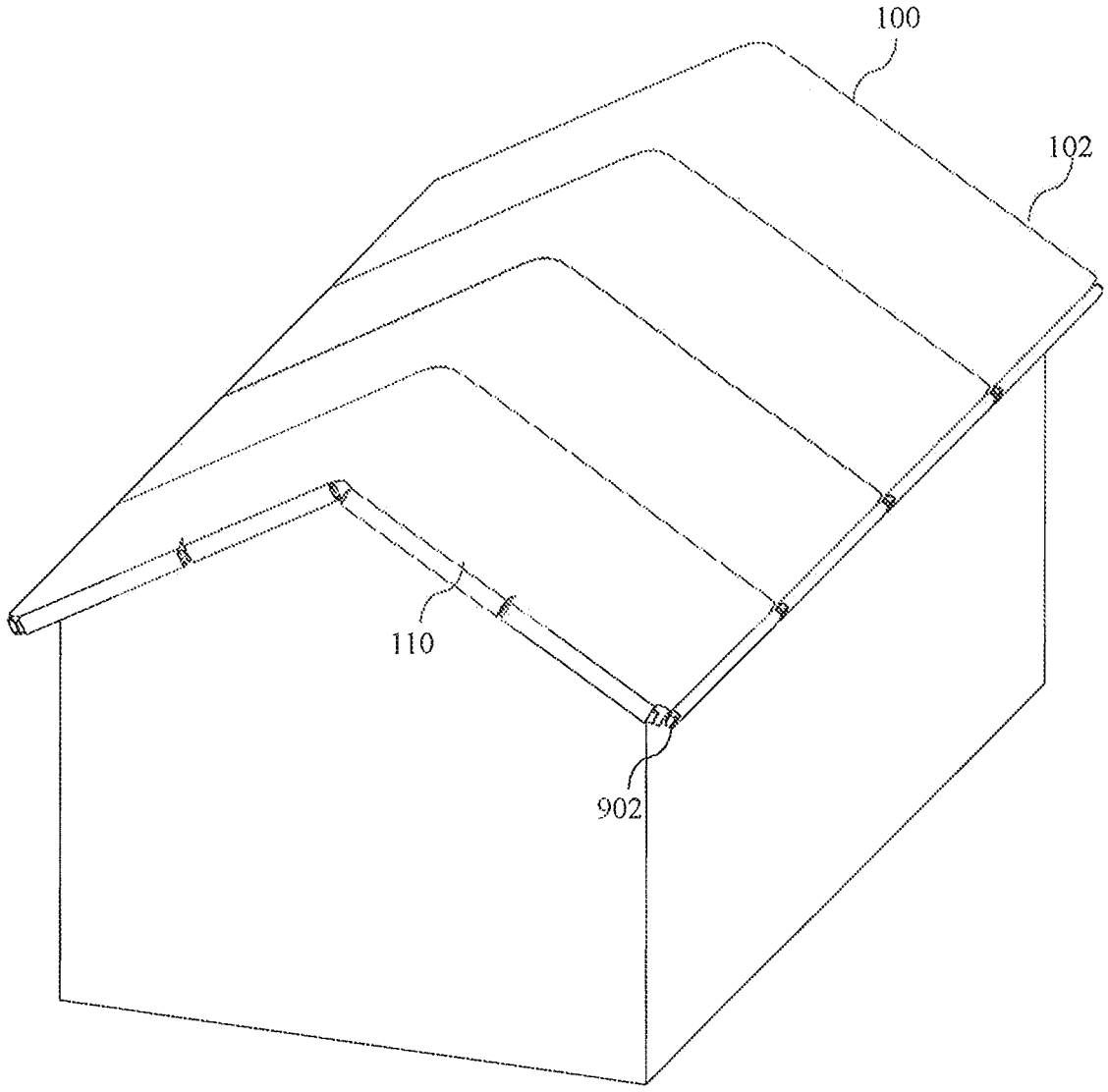
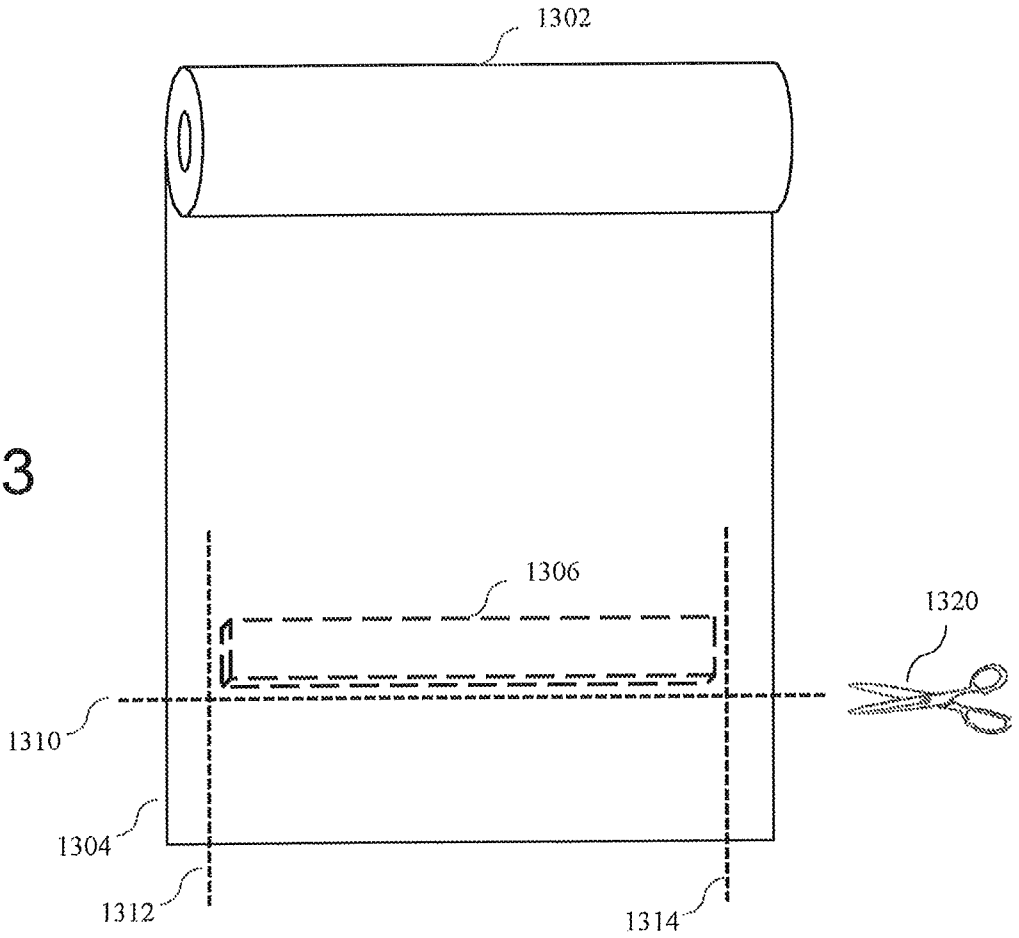


Fig. 12

Fig. 13



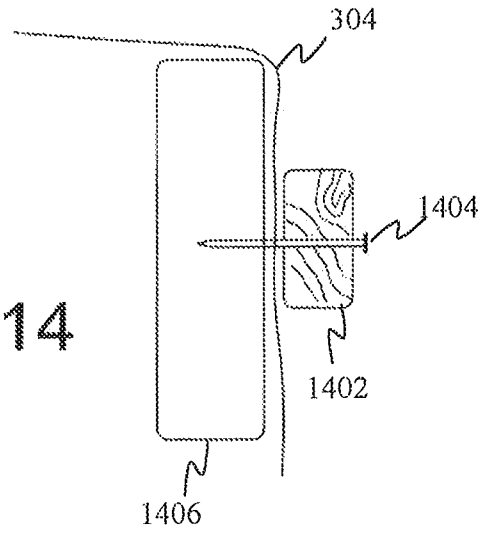


Fig. 14

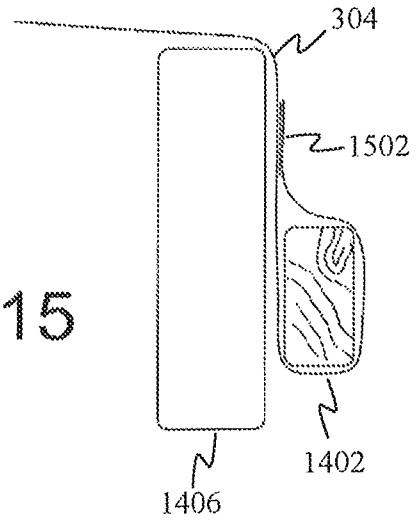


Fig. 15

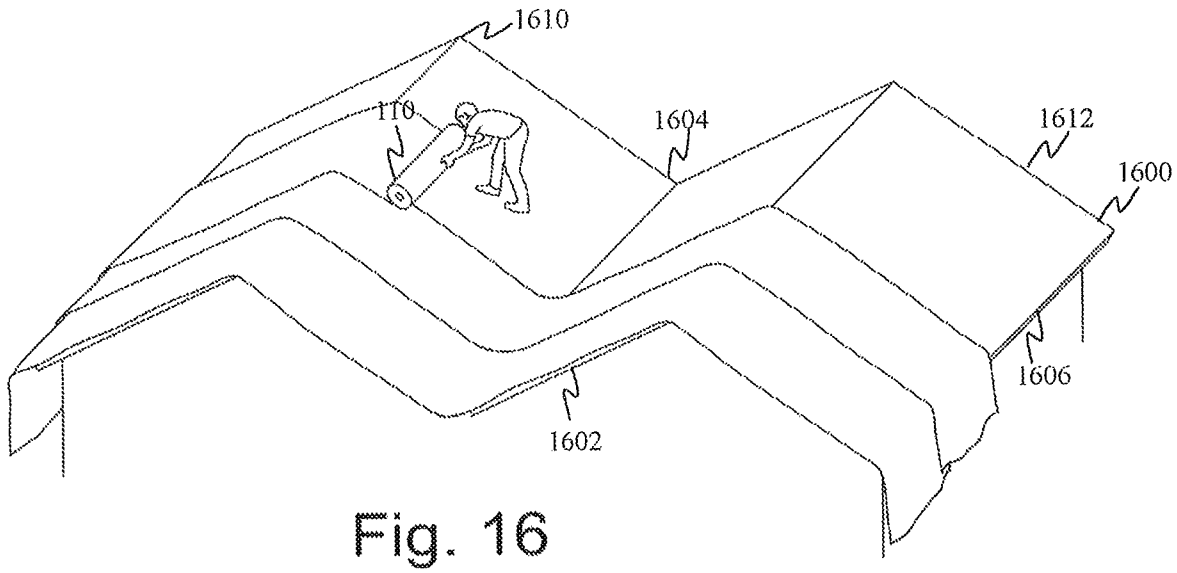


Fig. 16

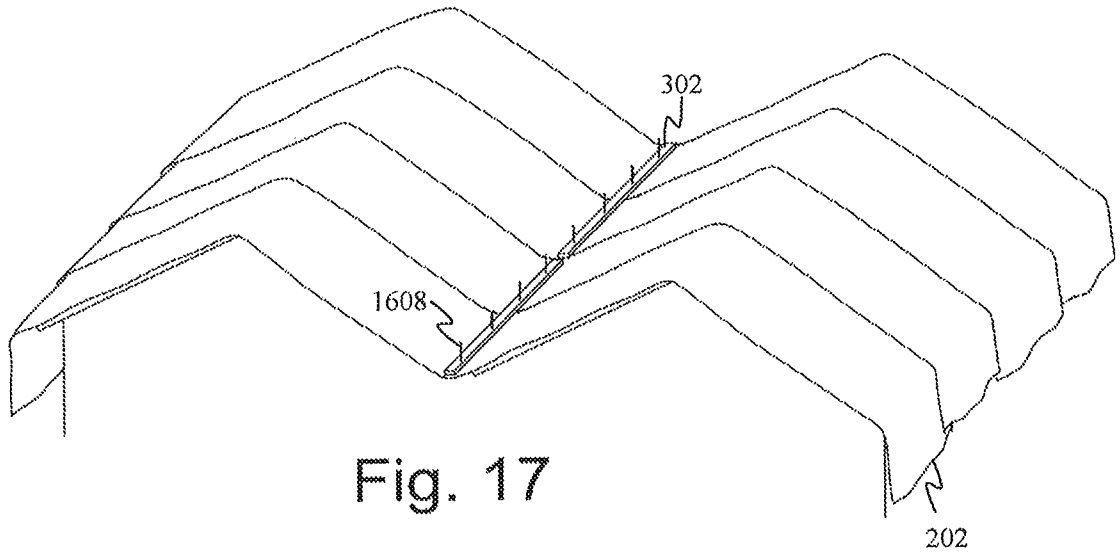


Fig. 17

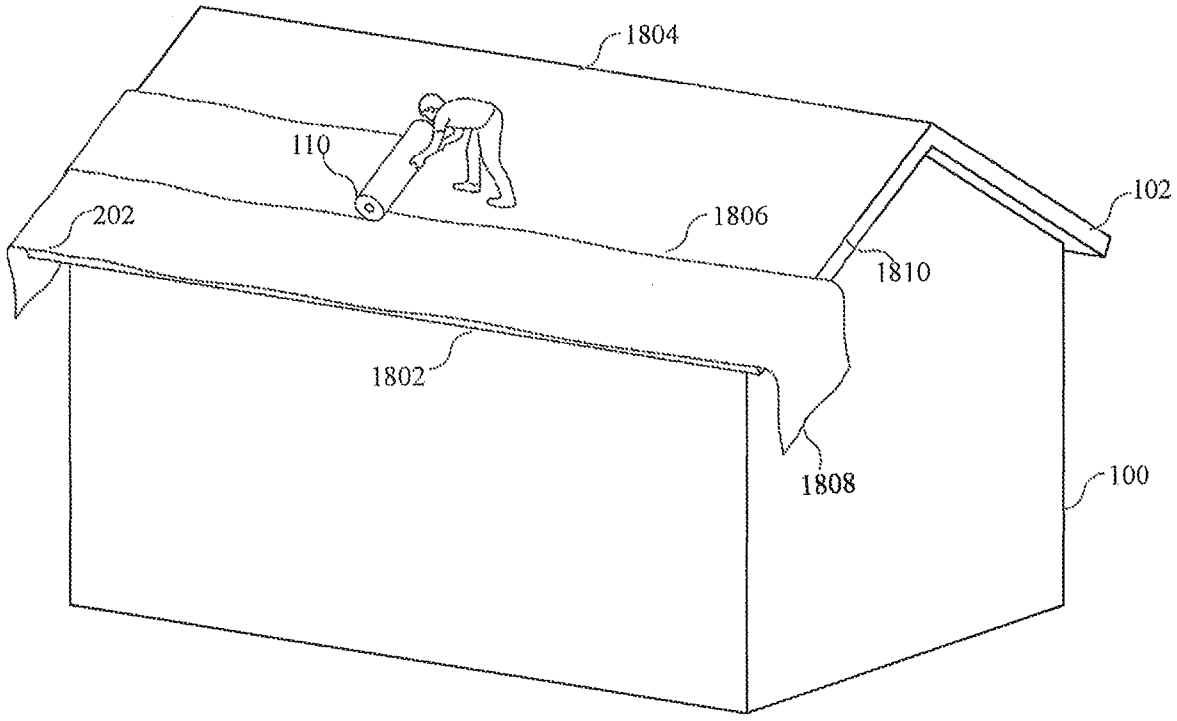


Fig. 18

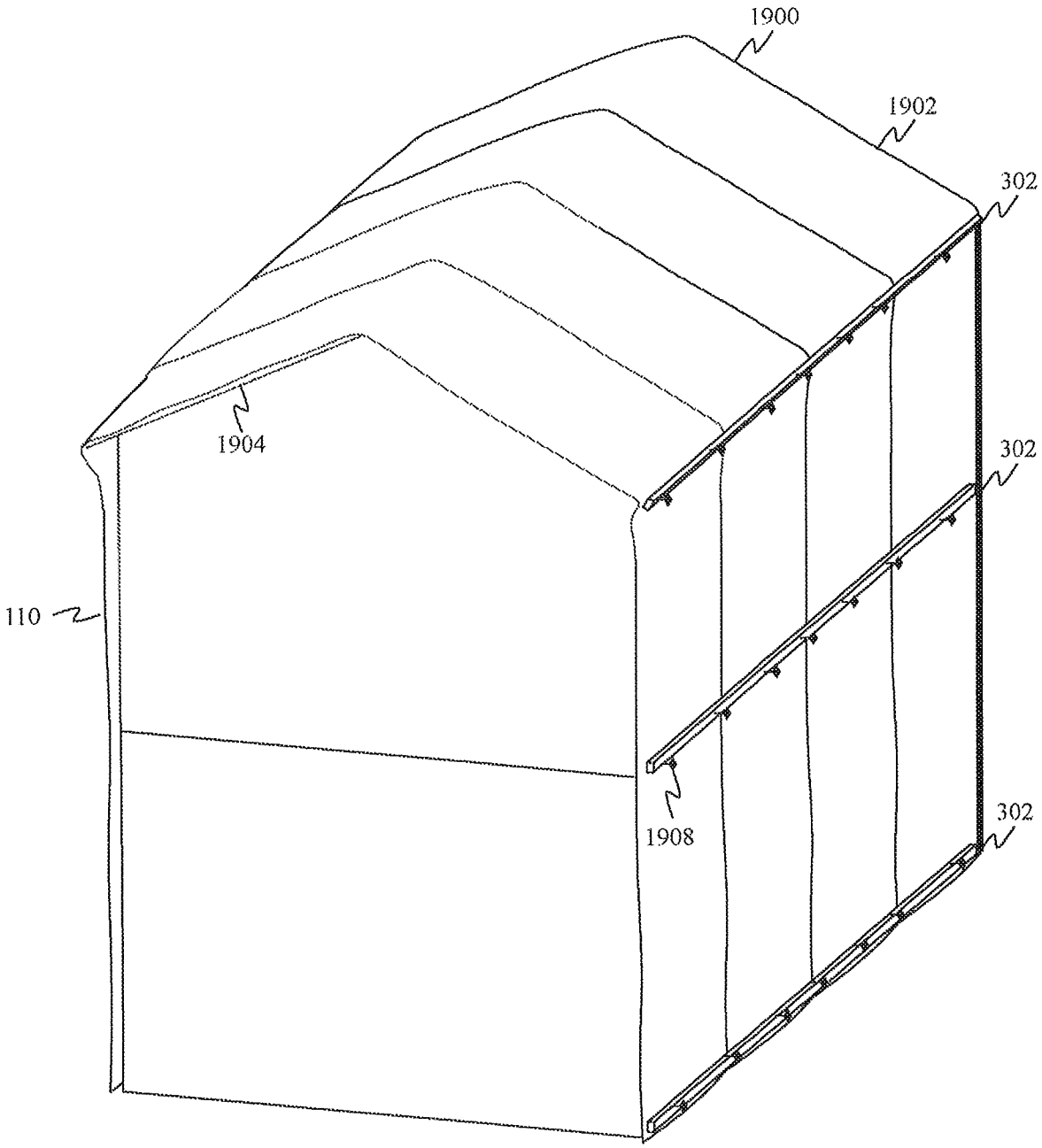


Fig. 19

METHOD FOR COVERING ROOF WITH SHRINK WRAP

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of, and claims priority to, application Ser. No. 16/902,851 (now U.S. Pat. No. 10,851,546) filed Jun. 16, 2020 and titled "Method for Covering Roof with Shrink Wrap", which is a continuation in part of, and claims priority to, application Ser. No. 16/681,421 (now U.S. Pat. No. 10,683,666) filed Nov. 12, 2019 and titled "Method for Covering Roof with Shrink Wrap", which is a continuation in part of application Ser. No. 16/294,554 (now U.S. Pat. No. 10,472,827) filed Mar. 6, 2019 and titled "Method for Covering Roof with Shrink Wrap." The subject matter of application Ser. Nos. 16/902,851, 16/681,421 and 16/294,554 are hereby incorporated by reference in their entirety.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable.

INCORPORATION BY REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

Not Applicable.

TECHNICAL FIELD

The technical field relates generally to the field of residential and commercial structural maintenance and, more specifically, relates to the field of roof maintenance for residential and commercial structures.

BACKGROUND

Maintenance is the process of ensuring that buildings and structures retain a good appearance and operate at optimum efficiency. Inadequate maintenance can result in decay, degradation and reduced performance and can affect health and threaten the safety of users, occupants and others in the vicinity. Building structure, and roofs in particular, are regularly subjected to harsh conditions including wind, rain, snow, heat, cold, and storms. Said conditions can cause damage to the roof, as well as the interior of the structure. For these reasons, roofs require regular maintenance to maintain optimum efficiency and continue to accomplish their design goals.

When roofs suffer significant damage, however, significant construction or refurbishing services may be necessary. This may require a long period of time to accomplish, as contractors must be found and assigned to the job, permits must be obtained, and money must be allocated and transferred. During this period time, the roof cannot be left unattended, as the roof the contents of the structure may suffer further damage. In these situations, therefore, temporary remedial or protective measures are necessary.

Various approaches to this problem have been proposed. A well-known approach to this problem is to attach a temporary water-impermeable membrane to the exterior of the roof to prevent water from penetrating the roof while it remains damaged, also known as the blue tarp method. These approaches, however, are difficult and time-consuming to implement. The current approaches to the problem of applying a temporary membrane to a damaged roof do not address the issue of properly fitting the membrane to the roof size and shape. The current approaches also do not address the issue of fastening the ends or the perimeter of the membrane to the roof. Improper fitting of the membrane to the size and shape of the roof can result in a membrane that can be removed by strong winds or permit water to enter in between the membrane and the roof. Additionally, improper fastening of the ends, or perimeter of, the membrane, can result in a membrane that is too easily removed and allows water penetration. For these reasons, the current approaches to the problem of applying a temporary membrane to a damaged roof are inadequate.

Additionally, the current approaches to the problem of applying a temporary membrane to a damaged roof, including the blue tarp method, add holes to the top of the roof, which can cause further water leakage into the structure, and only last for up to 90 days. In fact, the Federal Emergency Management Agency, FEMA, even categorizes the blue tarp method as only a 30-day solution. Therefore, the current approaches to the problem of applying a temporary membrane to a damaged roof are temporary at best.

Therefore, a need exists to overcome the problems with the prior art as discussed above, and particularly for a more efficient way of applying temporary remedial or protective measures onto a damaged roof.

SUMMARY

A system and method for temporary protection of a damaged roof is provided. This Summary is provided to introduce a selection of disclosed concepts in a simplified form that are further described below in the Detailed Description including the drawings provided. This Summary is not intended to identify key features or essential features of the claimed subject matter. Nor is this Summary intended to be used to limit the claimed subject matter's scope.

In one embodiment, a system and method for temporary protection of a damaged roof is provided that solves the above-described problems. The system and method for covering at least a portion of a roof with an impermeable membrane comprises a method that includes placing a strip of the impermeable membrane over the portion of the roof intended to be covered, cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered, draping an end of the strip over a fascia of eaves of the roof, placing elongated construction material on the end of the strip contacting fascia of eaves of the roof, attaching the elongated construction material to the fascia of eaves of the roof using a plurality of fasteners, and repeating the steps above until the portion of the roof is covered in the impermeable membrane.

In another embodiment, a system and method for temporary protection of a damaged roof is provided that solves the above-described problems. The system and method for covering at least a portion of a roof with an impermeable membrane comprises a method that includes placing a strip of the impermeable membrane over the portion of the roof intended to be covered, cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered, creating an envelope by folding an end of the strip and attaching, using adhesive, a terminal end of the strip to the impermeable membrane, placing elongated construction material in the envelope that was created in the end of the strip, attaching the envelope to a fascia of eaves of the roof using a plurality of fasteners, wherein each of the plurality

of fasteners are driven through the end of the strip and the elongated construction material, and repeating the steps above until the portion of the roof is covered in the impermeable membrane.

In another embodiment, a system and method for temporary protection of a damaged roof is provided that solves the above-described problems. The system and method for covering at least a portion of a roof of a structure with an impermeable membrane comprises a method that includes placing a strip of the impermeable membrane over the portion of the roof intended to be covered, cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered, draping an end of the strip over a fascia of eaves of the roof, placing first elongated construction material on the end of the strip contacting fascia of eaves of the roof, attaching the first elongated construction material to the fascia of eaves of the roof using a plurality of fasteners, placing second elongated construction material on the impermeable membrane contacting a valley of the roof, attaching the second elongated construction material to the valley of the roof using a plurality of fasteners, and repeating the steps above until the portion of the roof is covered in the impermeable membrane.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. In the drawings:

FIG. **1** is an illustration of a perspective view of a residential structure with a damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **2** is an illustration of a close-up perspective view of the residential structure with the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **3** is an illustration showing construction material in the process of being wrapped in the impermeable membrane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **4** is an illustration showing construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **5** is an illustration showing a cross-sectional view of construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **6** is an illustration showing two strips of the impermeable membrane being fastened together using heat, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **7** is an illustration showing two strips of the impermeable membrane being fastened together using a roller device, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **8** is an illustration of a perspective view of the residential structure with a damaged roof, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment.

FIG. **9** is another illustration showing construction material in the process of being wrapped in the impermeable membrane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **10** is another illustration showing construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **11** is another illustration showing a cross-sectional view of construction material completely wrapped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **12** is another illustration of a perspective view of the residential structure with a damaged roof, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment.

FIG. **13** is an illustration showing how an end of the strip of membrane is cut, according to an example embodiment.

FIG. **14** is another illustration showing a cross-sectional view of construction material attached to the residential structure with the impermeable membrane, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **15** is an illustration showing a cross-sectional view of construction material enveloped in the impermeable membrane and attached to the damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **16** is an illustration of a perspective view of a residential structure with a damaged roof containing a valley, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **17** is another illustration of a perspective view of a residential structure with a damaged roof containing a valley, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **18** is an additional illustration of a perspective view of a residential structure with a damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

FIG. **19** shows a perspective view of a multi-story residential structure with a damaged roof, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment.

DETAILED DESCRIPTION

The following detailed description refers to the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the following description to refer to the same or similar elements. While embodiments of the claimed subject matter may be described, modifications, adaptations, and other implementations are possible. For example, substitutions, additions, or modifications may be made to the elements illustrated in the

drawings, and the methods described herein may be modified by substituting, reordering, or adding stages to the disclosed methods. Accordingly, the following detailed description does not limit the claimed subject matter. Instead, the proper scope of the claimed subject matter is defined by the appended claims.

The claimed subject matter improves over the prior art by providing an economic, user-friendly and effective way of temporarily protecting a damaged roof, and the contents of the structure, from further damage. The claimed subject matter is further easy to learn for workers and timesaving to implement. The claimed subject matter further improves over the prior art by properly fitting the membrane to the roof size and shape and properly fastening the ends or the perimeter of the membrane to the roof. Proper fitting of the membrane to the size and shape of the roof results in a membrane that cannot be removed by strong winds or permit water to enter in between the membrane and the roof. Additionally, proper fastening of the ends, or perimeter of, the membrane, results in a membrane that is not easily removed and does not allow water penetration. Furthermore, the claimed subject matter does not introduce additional holes into the damaged roof and is a more than a temporary solution, as it can persist for periods of time longer than 90 days.

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. The claimed system and method for temporary protection of a damaged roof will now be described with respect to FIGS. **1** through **8**. FIG. **1** is an illustration of a perspective view of a residential structure **100** with a damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **1** shows that the proposed system and method includes the application of an impermeable membrane to the damaged roof.

The proposed system utilizes a water impermeable membrane that may shrink when heat is applied. Namely, when heat is applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. The water impermeable membrane may be used in a variety of thicknesses, clarities, strengths and shrink ratios. The water impermeable membrane may comprise polyolefin and may be a material made up of polymer plastic film. Polyolefin is a type of polymer produced from a simple olefin (also called an alkene) as a monomer. Other examples of materials used for the water impermeable membrane include PVC, polyethylene, polypropylene, EP/EVA/copolyester/EVA/EP (where EP is ethylene-propylene and EVA is ethylene-vinyl acetate copolymer) and other compositions.

The water impermeable membrane may be provided in rolls **110** of a certain width. In one embodiment, each roll **110** of the water impermeable membrane comprises a width of about 24 to 42 inches, with each roll provided from about 40 feet to about 120 feet of length of the water impermeable membrane. FIG. **1** shows that several rolls **110** of the impermeable membrane have been placed on top of the damaged roof **102** of the residential structure **100**. Each roll **110** is unrolled on top of the damaged roof **102** in the same direction and the sides of each unrolled strip of impermeable membrane are placed adjacent to another unrolled strip of impermeable membrane, such that the sides of each unrolled strip are coupled with the sides of the unrolled strips adjacent, as described more fully below.

In one alternative embodiment, strips, or portions of, the rolls **110** are cut from the roll before they are placed on top of the damaged roof **102** of the residential structure **100**. In this embodiment, a length of impermeable membrane is cut from the roll, and subsequently placed on top of the damaged roof **102** of the residential structure **100**. In this embodiment, workers measure the length of impermeable membrane needed for the roof, and subsequently, said measured length of impermeable membrane is cut from the roll, and then placed on top of the damaged roof **102** of the residential structure **100**.

FIG. **2** is an illustration of a close-up perspective view of the residential structure **100** with the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **2** shows multiple rolls **110** of the impermeable membrane have been placed on top of the damaged roof **102** of the residential structure **100** in order to protect said roof, and the contents of the residential structure **100**, from further damage or decay from precipitation, wind, etc. FIG. **2** shows that each roll **110** is unrolled, either fully or partially, on top of the damaged roof **102** in the same direction. FIG. **2** also shows that the sides of each unrolled strip **202** of impermeable membrane are placed adjacent to another unrolled strip **204** of impermeable membrane. More specifically, FIG. **2** shows that the sides of each unrolled strip **202** of impermeable membrane are placed so as to overlap (by about 3 to 8 inches) with the sides of the adjacent unrolled strip **204** of impermeable membrane. In one embodiment, each unrolled strip **202** of impermeable membrane are placed so as to overlap with the sides of the adjacent unrolled strip **204** of impermeable membrane by exactly 3 inches. Subsequently, the sides of each unrolled strip are coupled with the sides of the unrolled strips adjacent, as described more fully below. Again, in one alternative embodiment, strips, or portions of, the rolls **110** are cut from the roll before they are placed on top of the damaged roof **102** of the residential structure **100**.

FIG. **3** is an illustration showing construction material **302** in the process of being wrapped in the impermeable membrane **304**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. In FIG. **3**, the construction material **302** is a piece of lumber, which is a type of wood that has been processed into beams and planks. A plank, i.e., a wood plank or plank of wood, is timber that is flat, elongated, and rectangular with parallel faces that are higher and longer than wide. Planks are usually more than 1½ in (38 mm) thick and are generally wider than 2½ in (64 mm). Planks can be any length and are generally a minimum of 2 in (51 mm) deep by 8 in (200 mm) wide, but planks that are 2 in (51 mm) by 10 in (250 mm) and 2 in (51 mm) by 12 in (300 mm) are more common. In one embodiment, the construction material **302** is a wood plank that measures 2 in×4 in, 2 in×6 in, 2 in×8 in, or 2 in×12 in. In one embodiment, the construction material **302** is a wood plank that measures 1'×2'×8'.

In other embodiments, the construction material **302** may be other items, such as portions of metal siding, portions of roof tile, etc. FIG. **3** shows the roll **110** of impermeable membrane has been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves of the damaged roof **102** of the residential structure. FIG. **3** shows that the end of the unrolled strip **202** (which was rolled around the

construction material **302**) has been attached to the construction material **302** via one or more fasteners **309**, which is a staple. In one embodiment, T50 ⅜' galvanized steel staples are placed 4 inches apart on the end of the unrolled strip **202**. In another embodiment, exactly 24 staples are placed on the end of the unrolled strip **202** per instance (or plank) of construction material **302**, so as to attach the unrolled strip to the construction material. Other types of fasteners may be used to attach the construction material **302** to the end of the unrolled strip **202**, such as nails, clips, screws, etc. Also, adhesive may be used to attach the construction material **302** to the end of the unrolled strip **202**. FIG. **3** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202** in a clockwise **319** direction so that the open end of the roll faces downwards.

In an alternative embodiment, the construction material **302** is a flexible piece of plastic strip that is available in a coiled form in 50-foot coils. The plastic, which may be regrind plastic, is uncoiled for use as the construction material for attaching to the roof. The plastic strip may be a flexible, elongated band of material. The plastic strip is wrapped in the end of the unrolled strip **202** as described above, and the unrolled strip is attached to the plastic strip as described above. Said plastic strip is smaller than wood planks, easier to store, flexible for use in different shapes and allows work crews to work more efficiently. In one alternative embodiment, the plastic strip is not wrapped in the end of the unrolled strip **202**, as described above, rather, the outward edge of the end of the unrolled strip **202** is attached to the plastic strip either using adhesive tape, adhesive or using a fastener **309**, as described above.

FIG. **4** is an illustration showing construction material **302** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **4** shows the roll **110** of impermeable membrane had been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves **409** of the damaged roof **102**, so as to be applied to the construction material **302**. FIG. **4** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **409** of the damaged roof **302**. Note that the construction material **302** is attached to the vertical, outward-facing fascia **408** of the eaves of the roof. In one embodiment, each instance of the construction material **302** is spaced 4 inches apart from the next instance of the construction material on the fascia **408** of the eaves of the roof, around the entire perimeter of the roof. Through testing, the applicant discovered that less than 4 inches would result in a roof not being properly vented and more than 4 inches would not be secure (waterproof) enough.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, the plastic is uncoiled for use as the construction material for attaching to the roof, and the plastic strip is attached to the vertical, outward-facing fascia **408** of the eaves of the roof as described above.

FIG. **4** shows the construction material **302** is attached to the vertical, outward-facing fascia **408** of the eaves of the roof. In another alternative embodiment, the construction material **302** may be attached to the top of the roof **130** (see FIG. **1**), the downward facing surface **131** under the eaves of the roof, or the vertical wall **132** supporting the roof. In these alternative embodiments, the construction material **302** may be attached using fasteners **502** (or their equivalent, as described below), adhesive tape or simply adhesive.

FIG. **5** is an illustration showing a cross-sectional view of construction material **302** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **5** shows that the construction material **302** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **409** of the damaged roof **102**. The construction material **302** may be wrapped such that the end of the unrolled strip **302** completely surrounds the construction material 1 time, 2 times, or 3-4 times. I.e., in one embodiment, construction material **302** is wrapped 1 time, 2 times, or 3-4 times in the end of the unrolled strip. In another embodiment, the construction material **302** may be wrapped such that the end of the unrolled strip **302** is wrapped one half turn around the construction material (i.e., it surrounds 180 degrees of the outside perimeter of the cross section of the construction material).

FIG. **5** shows that the end of the unrolled strip **202** (after wrapping the construction material **302**) has been attached to the construction material **302** via a fastener **309**, which is a staple. FIG. **5** further shows that the construction material **302** and the end of the unrolled strip **202** (which wraps around the construction material **302**) has been attached to the eaves **409** of the roof via one or more fasteners **502**, which is a nail. Other types of fasteners may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof, such as clips, screws, etc. Also, adhesive may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof. Further, adhesive tape may be used to attach the construction material **302** and the end of the unrolled strip **202** to the eaves of the roof. In one embodiment, the fastener **502** is a #10 3-inch polymer-coated exterior screw placed every 16 inches along the length of the construction material **302** and the end of the unrolled strip **202**, so as to attach the construction material **302** and the end of the unrolled strip **202** to the fascia **408** or to the portions **130**, **131** or **132** of the structure. If the fascia **408** (or to the portions **130**, **131** or **132** of the structure) consists of concrete, brick or block, then the fastener **502** is a ¼"2¾" concrete anchor placed every 16 inches along the length of the construction material **302**, so as to attach the construction material **302** and the end of the unrolled strip **202** to the fascia **408** or to the portions **130**, **131** or **132** of the structure. In one embodiment, the fastener **502** is a 3"×0.120 galvanized nail deployed with a nail gun and placed every 16 inches along the length of the construction material **302** and the end of the unrolled strip **202**, so as to attach the construction material **302** and the end of the unrolled strip **202** to the fascia **408** or to the portions **130**, **131** or **132** of the structure. In another embodiment, exactly 6 nails or screws are placed along the length of the construction material **302** and the end of the unrolled strip **202**, so as to attach the construction material **302** and the end of the unrolled strip **202** to the fascia **408** or to the portions **130**, **131** or **132** of the structure.

In one embodiment, the method or process of attaching the ends of the unrolled strip **202** to the eaves of the damaged roof **102** occurs as follows. A first unrolled strip of the impermeable membrane is draped over the roof **102**, wherein the end of the strip overhangs the eaves of the roof. Then, a wood plank is placed horizontally under the end of the strip that overhangs the eaves of the roof, such that the

wood plank is placed below the eaves of the roof. The wood plank is placed far enough below the eaves of the roof such that when the wood plank is rolled up in the end of the strip (described below), the wood plank is at the height of the fascia of the eaves of the roof. Next, the left and right sides of the strip are cut vertically such that the strip is coextensive with a length of the wood plank. The end of the strip is also cut horizontally below the wood plank. That is, assuming the wood plank is placed horizontally so that it is parallel with the fascia of the eaves of the roof, a vertical cut is placed in the end of the strip on the left of the wood plank, a vertical cut in placed in the end of the strip on the right of the wood plank, and a horizontal cut is placed in the end of the strip below the wood plank.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip (wherein the plastic is uncoiled for use as the construction material for attaching to the roof, and the plastic strip is attached to the vertical, outward-facing fascia **408** of the eaves of the roof), the plastic strip is placed horizontally under the end of the membrane strip that overhangs the eaves of the roof, such that the plastic strip is placed below the eaves of the roof. The plastic strip is placed far enough below the eaves of the roof such that when the plastic strip is rolled up in the end of the membrane strip (described below), the plastic strip is at the height of the fascia of the eaves of the roof. The left and right sides of the membrane strip are not necessarily cut vertically. The end of the membrane strip may be cut horizontally below the plastic strip. That is, assuming the plastic strip is placed horizontally so that it is parallel with the eaves of the roof, a horizontal cut is placed in the end of the membrane strip below the plastic strip. There is no need to cut the membrane strip vertically because the plastic strip may be extended beyond the left and right edges of the membrane strip.

In another alternative embodiment where the construction material **302** is a flexible piece of plastic strip (wherein the plastic is uncoiled for use as the construction material for attaching to the roof, and the plastic strip is attached to the vertical, outward-facing fascia **408** or to the portions **130**, **131** or **132** of the structure), the plastic strip is placed horizontally under the end of the membrane strip. The left and right sides of the membrane strip are not necessarily cut vertically. The end of the membrane strip may be cut horizontally below the plastic strip. That is, assuming the plastic strip is placed horizontally so that it is parallel with the end of the membrane strip, a horizontal cut may or may not be placed in the end of the membrane strip below the plastic strip. There is no need to cut the membrane strip vertically because the plastic strip may be extended beyond the left and right edges of the membrane strip. Then, the end of the membrane strip may be attached to the plastic strip using a fastener, adhesive tape or simply adhesive. Subsequently, the construction material **302** is attached to fascia **408** or to the portions **130**, **131** or **132** of the structure.

Returning to the wood plank embodiment, the wood plank is fastened to the end of the strip using a plurality of staples. Next, the wood plank is rolled one half turn (180 degree turn), one full turn (360 degrees), two full turns (720 degrees), or three full turns in the end of the strip, such that the wood plank is at a height of the fascia of the eaves of the roof. Then, the wood plank that was rolled in the end of the strip is attached to the fascia of the eaves of the roof using a plurality of nails. Further, each strip of the impermeable membrane that has been draped over the roof is placed such that it overlaps at least three inches with each adjacent strip of the impermeable membrane that has been draped over the roof. The steps above are repeated until the entire roof is covered in the impermeable membrane. Finally, heat is applied using a heat source to a portion of each strip that overlaps an adjacent strip, so as to meld the portion of each strip with the adjacent strip (as described more fully below). Also, heat may be applied using a heat source to all or a portion of the impermeable membrane on the roof, so as to shrink the membrane for aerodynamic purposes (to reduce or eliminate the membrane blowing off in a wind) and for hydrodynamic purposes to aid in water running or falling off the roof.

FIG. **6** is an illustration showing two strips **602**, **604** of the impermeable membrane being fastened together using heat, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. Recall that the water impermeable membrane that may shrink when heat is applied. Namely, when heat is applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. FIG. **6** shows that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane are placed such that that the sides of each strip overlap (by about 3 to 8 inches) with the sides of the adjacent strip of impermeable membrane. Subsequently, heat is applied to the overlapping portion of the sides of each strip using a blowtorch or other heat device **610**. As a result, the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane are melded together, thereby producing a seam that is also water impermeable.

FIG. **7** is an illustration showing two strips **602**, **604** of the impermeable membrane being fastened together using a roller device **702**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **7** shows that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane were placed such that that the sides of each strip overlap and heat was applied to the overlapping portion so that the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane were melded together, thereby producing a seam that is also water impermeable. FIG. **7** shows that a roller **702** is applied to the overlapping portion or seam so as to secure the sides **612**, **614** of the two strips **602**, **604** of the water impermeable membrane together. The roller **702** may comprise a cylinder **704** that rotates as it rolls over the overlapping portion, thereby patting down any bubbles or undulations in the overlapping portion. The purpose of applying the roller **702** is to flatten the overlapping portion or seam as much as possible, resulting in a stronger seam and a flatter surface that optimizes water runoff.

The roller **702** may comprise leather that has been placed over the cylinder **704**. A Kevlar thread may be used to sew the leather onto the cylinder **704** of the roller **702**. Said roller cover withstands high heat and allows users to fuse the sides or seams of the strips **602**, **604** together.

FIG. **8** is an illustration of a perspective view of the residential structure **100** with a damaged roof **102**, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment. FIG. **8** shows that multiple rolls **110** of the impermeable membrane have been draped on top of the damaged roof **102** of the residential structure **100** in the

same direction and the sides of each unrolled strip of impermeable membrane have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof is covered in the impermeable membrane. Finally, sandbags may be placed on top of the impermeable membrane that has been draped over the roof, in order to hold the impermeable membrane on top of the roof. FIG. **8** shows that the construction material **302** on the eaves of the roof has been wrapped in the end of the unrolled strip **202** in a clockwise direction so that the open end of the roll faces downwards. This reduces or eliminates the pooling of water in the open end of the roll.

Said process described above for waterproofing a structure can also be used to provide wall insulation for a wall of a structure, to provide dust barriers for a structure, to provide waterproofing of a structure during construction, to provide waterproofing of a structure under construction that is lacking exterior windows, doors and walls, and for containment of the interior of buildings. Said process described above for waterproofing a structure can also be used to provide a separation in the interior of buildings or warehouses for smaller temporary rooms for security or temperature control.

Note that although FIG. **8** shows that the entire top of the roof of the structure has been completely covered by the impermeable membrane, the claimed embodiments support a process wherein only a predetermined portion, or subset, of the top of the roof of the structure has been covered by the impermeable membrane. This embodiment works in cases where only a portion of the roof has been damaged and saves the time and expense of covering the entire roof, which may not be necessary.

FIG. **9** is another illustration showing construction material **902** in the process of being wrapped in the impermeable membrane **304**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. In FIG. **9**, the construction material **902** is rolled in the end of the unrolled strip **202** in a counterclockwise direction **919** so that an open end of the roll faces upwards. FIG. **9** shows the roll **110** of impermeable membrane has been unrolled to such a length that the end of the unrolled strip **202** overhangs the eaves of the damaged roof **102** of the residential structure. FIG. **9** shows that the end of the unrolled strip **202** (which was rolled around the construction material **902**) has been attached to the construction material **902** via a fastener **309**, which is a staple.

FIG. **10** is an illustration showing construction material **902** completely wrapped in the impermeable membrane **304** and attached to the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. Note that the construction material **902** is attached to the vertical, outward-facing fascia of the eaves of the roof. FIG. **10** shows that the construction material **902** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves of the damaged roof **102**.

In the event that attachment of the construction material **902** can't be made below the eaves of the roof, sandbags may be placed at the edge of the roof surface. Sandbags may be placed approximately 4-6' inside the edge of the strip of impermeable membrane **304** from the edges of the roof. The end of the strip of impermeable membrane **304** may be folded over the sandbags and the end of the strip of impermeable membrane **304** may be heat treated (as shown in FIG. **6**), therefore encapsulating the sandbags. Sandbags may be placed every 15-20'. Once heated, the sandbags may be rolled one additional time on to itself to provide added support.

FIG. **11** is an illustration showing a cross-sectional view of construction material **902** completely wrapped in the impermeable membrane **304** and attached to the fascia of the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **11** shows that the construction material **902** has been wrapped in the end of the unrolled strip **202** in a counterclockwise direction so that the open end of the roll faces upwards. The construction material **902** may be wrapped such that the end of the unrolled strip **202** completely surrounds the construction material 1-time, 2-times or, alternatively, 3-4 times. I.e., in one embodiment, construction material **902** is wrapped 1-time, 2-times or, alternatively, 3-4 times in the end of the unrolled strip. FIG. **11** shows that the end of the unrolled strip **202** (after wrapping the construction material **902**) has been attached to the construction material **902** via a nail **502**.

FIG. **12** is another illustration of a perspective view of the residential structure **100** with a damaged roof **102**, showing the proposed system and method for temporary protection of a damaged roof completely applied, according to an example embodiment. FIG. **12** shows that multiple rolls **110** of the impermeable membrane have been draped on top of the damaged roof **102** of the residential structure **100** in the same direction and the sides of each unrolled strip of impermeable membrane have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof is covered in the impermeable membrane. FIG. **12** shows that the construction material **902** on the eaves of the roof has been wrapped in the end of the unrolled strip **202** in a counterclockwise direction so that the open end of the roll faces upwards.

FIG. **13** is an illustration showing how an end of the strip of membrane is cut, according to an example embodiment. In one embodiment, the method or process of attaching the ends of the unrolled strip **1304** to the eaves of the damaged roof **102** occurs as follows. A first unrolled strip **1304** of the impermeable membrane **1302** is draped over the roof **102**, wherein the end of the strip overhangs the eaves of the roof. Then, a wood plank **1306** is placed horizontally under the end of the strip **1304** that overhangs the eaves of the roof, such that the wood plank is placed below the eaves of the roof. The wood plank is placed far enough below the eaves of the roof such that when the wood plank is rolled up in the end of the strip, the wood plank is at the height of the eaves of the roof.

Next, the right side of the strip **1304** is cut (using a cutting device, such as scissors **1320**) vertically along a line **1314** to substantially match the length of the wood plank **1306**. Said cut on the right side of the strip **1304** may be 6 inches long and may be placed at least one inch from the right side of the plank **1306**. Also, the left side of the strip **1304** is cut vertically along a line **1312** to substantially match the length of the wood plank **1306**. Said cut on the left side of the strip **1304** may be 6 inches long and may be placed at least one inch from the left side of the plank **1306**. Next, the end of the strip **1304** is cut horizontally along a line **1310** below the wood plank **1306**. Said cut may be placed flush with the bottom of the plank **1306** or may be placed at least one inch from the bottom of the plank **1306**. Then, the wood plank is rolled in the strip **1304** as described above. Subsequently, the wood plank is fastened to the end of the strip using a plurality of staples. Next, the wood plank is rolled one half turn, one full turn, two full turns, or three full turns in the end

of the strip, such that the wood plank is at a height of the eaves of the roof. Then, the wood plank that was rolled in the end of the strip is attached to the eaves of the roof using a plurality of nails.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, the plastic strip is placed horizontally under the end of the membrane strip that overhangs the eaves of the roof, such that the plastic strip is placed below the eaves of the roof. The plastic strip is placed far enough below the eaves of the roof such that when the plastic strip is rolled up in the end of the membrane strip (described below), the plastic strip is at the height of the fascia of the eaves of the roof. The left and right sides of the membrane strip are not necessarily cut vertically. The end of the membrane strip may be cut horizontally below the plastic strip. That is, assuming the plastic strip is placed horizontally so that it is parallel with the eaves of the roof, a horizontal cut is placed in the end of the membrane strip below the plastic strip. There is no need to cut the membrane strip vertically because the plastic strip may be extended beyond the left and right edges of the membrane strip.

In an alternative embodiment where the construction material **302** is a flexible piece of plastic strip, a high-rise building attachment method is also disclosed. The process may begin on the second floor of the building, wherein a 2×4 wood plank is attached on an outside edge. Enough impermeable membrane is rolled out to extend to the bottom floor of the building with an extra door to make attachments. The flexible plastic strip is unrolled and attached to the outer most portion of the 2×4 using 2" screws. Then, the impermeable membrane is unrolled to the 1st floor. Next, on the 3rd floor of the building, a 2×4 wood plank is attached on an outside edge. Impermeable membrane is attached to the 3^{rd} floor and unrolled to the second floor. The flexible plastic strip is unrolled and attached to the outer most portion of the 2×4 of the 3^{rd} floor using 2" screws. Then, the impermeable membrane is unrolled to the 2nd floor. The ends of the impermeable membrane on the 2^{nd} floor are attached to the outer most portion of the 2×4 using 2" screws. This process is repeated for the entire high-rise.

FIG. **14** is an illustration showing a cross-sectional view of construction material **1402** pinning, such that it attaches, the impermeable membrane **304** to the damaged roof **102** as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **14** shows that the unrolled strip **202** has been placed over the damaged roof, as described with regard to FIGS. **1** and **2**, and has left an overhang that covers at least a portion of the eaves of the damaged roof **102**. In FIG. **14** the unrolled strip is not wrapped around the construction material **1402** but instead passes between the construction material and the fascia **1406**, being secured thereto using one or more fasteners **1404**, which may be a nail, a screw of the like. As described above, alternative fasteners including screws, staples, clips, etc. may be used to secure the construction material to the damaged roof. Likewise, the construction material **1402** may be of any variety of construction materials as described herein. In this embodiment, the construction material **1402** is not rolled or surrounded by the unrolled strip **202**.

FIG. **15** is an illustration similarly depicting a cross sectional view of construction material **1402** completely wrapped in the impermeable membrane **304** and attached to itself as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **15** shows that the construction material **1402** has been wrapped in the end of the unrolled strip **202**, which overhangs the eaves **1406** of the damaged roof **102**. Like in FIG. **14**, the unrolled strip is passed between the construction material and the eaves of the damage roof. The unrolled strip **202** creates an envelope around the construction material by being doubled (or folded) over the construction material a single time causing the terminal end **1502** of the unrolled strip to make contact with a portion of the unrolled strip above construction material **1402**, such that said envelope is created, thereby allowing the construction material to settle into the envelope created by the unrolled strip and make contact with the fascia **1406**. In one embodiment, the terminal end of the unrolled strip is then attached to itself slight above the top face of the construction material using an adhesive. In another embodiment, the terminal end of the unrolled strip is doubled (or folded) over the construction material and attached to itself using double-sided adhesive tape or other like adhesive materials.

FIGS. **16** and **17** show that several rolls of the impermeable membrane **110** have been placed on top of the damaged roof **102** of the residential structure **100**. Each roll **110** is unrolled on top of the damaged roof **102** in the same direction, and the sides of each unrolled impermeable membrane are placed adjacent to another unrolled strip of impermeable membrane, such that the sides of each unrolled strip are coupled with the sides of the adjacent unrolled strips. The figures show that the residential structure comprises two adjacent gable roofs, or four roof pitches **1602** that create two ridges **1610**, forming a valley **1604** between the ridges. The unrolled strips **202** are unrolled in a manner such that the unrolled strips overhang the eaves **1606** on two sides of the residential structure **100**.

FIG. **17** illustrates a method of attaching the unrolled strips **202** to the damaged roof **102** in the valley **1604** created by the two inner pitches of the residential structure **100**. FIG. **17** shows that construction material **302** is placed in the valley **1604** of the roof on top of the unrolled strips **202**, covering all unrolled strips placed on the damaged roof **102**. The construction material is then attached to the roof using fasteners **1608**, which may be nails. The material may be attached to the valley rafter, which is the rafter running along the valley created by two adjacent gable roofs, and may be attached using any such fastener as to secure the construction material to the roof, including staples, screws, etc.

FIG. **18** shows a perspective view of the residential structure **100** with the damaged roof **102**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **18** shows multiple rolls **110** of the impermeable membrane have been placed on top of the damaged roof **102** of the residential structure **100**. The figure shows that each roll **110** is unrolled, either fully or partially, across the roof in the same direction. In FIG. **18** each roll is unrolled parallel to the eaves **1802** and ridge **1804** of the residential structure **100**. The unrolled strips **202** are placed such that where two unrolled strip sides **1610** are adjacent to one another, the sides of each unrolled strip overlap the neighboring strip by between 3 to 8 inches. FIG. **18** additionally shows that unrolled strips are placed such that they create an overhang **1612** that covers the gable end **1614** on both sides of the residential structure **100**.

FIG. **19** shows a perspective view of a multi-story residential structure **1900** with a damaged roof **1902**, as the proposed system and method for temporary protection of a damaged roof is applied, according to an example embodiment. FIG. **19** shows several rolls **110** of the impermeable

membrane have been placed on top of the damaged roof of the multi-story residential structure **1900**. The unrolled strips **110** in FIG. **19** are unrolled parallel to eaves **1904** in a manner that creates an overlap of two adjacent unrolled strips and allows the unrolled strips to fall the entire height of the multi-story residential structure **1900**. The unrolled strips are then fixed to the residential structures using construction material **302**. Construction material **302** may be fixed to the multi-story residential in at least three different locations with approximately equal distance between each piece of construction material. Construction material **302** may be fixed to multi-story residential structure **1900** using fasteners **1908**, which may be nails. In one embodiment, construction material **302** is attached to the multi-story residential structure **1900**: 1) at the fascia of the roof (as shown in FIGS. **8** and **12**), 2) at the boundary between the first and the second story, and 3) at the bottom of the structure. The boundary is defined as that portion of the exterior surface of the structure **1900** that lies at the boundary between a first and second story of the structure, such as at the height of the first floor ceiling and/or at the height of the second story floor. The bottom of the structure is defined as that portion of the exterior surface of the structure **1900** that is at or near the ground or first story floor.

Note that in the embodiment of FIG. **19**, the intention is to cover at least a portion of the roof of the structure, as well as at least a portion of the sides of the structure, with an impermeable membrane. In this embodiment, the strips of the impermeable membrane are placed over the portion of the roof, and a portion of the sides of the structure, intended to be covered. In this embodiment, the membrane is cut to accommodate a size of the portion of the roof, and the portion of the sides of the structure, intended to be covered. In this embodiment, the ends of the strips are draped over a fascia of eaves of the roof and over the sides of the structure intended to the covered.

Embodiments may be described above with reference to functions or acts, which comprise methods. The functions/acts noted above may occur out of the order as shown or described. For example, two functions/acts shown or described in succession may in fact be executed substantially concurrently or the functions/acts may sometimes be executed in the reverse order, depending upon the functionality/acts involved. While certain embodiments have been described, other embodiments may exist. Further, the disclosed methods' functions/acts may be modified in any manner, including by reordering functions/acts and/or inserting or deleting functions/acts, without departing from the spirit of the claimed subject matter.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A method for covering at least a portion of a roof with an impermeable membrane, comprising:

a) placing a strip of the impermeable membrane over the portion of the roof intended to be covered;

b) cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered;

c) draping an end of the strip over a fascia of eaves of the roof;

d) placing elongated construction material on the end of the strip contacting the fascia of eaves of the roof;

e) attaching the elongated construction material to the fascia of eaves of the roof using a plurality of fasteners; and

f) repeating steps a) through e) until the portion of the roof is covered in the impermeable membrane.

2. The method of claim **1**, further comprising:

g) overlapping at least three inches of a first strip of the impermeable membrane that has been placed over the roof with a second strip of the impermeable membrane that has been placed over the roof.

3. The method of claim **2**, further comprising:

h) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to shrink the first strip and the second strip.

4. The method of claim **3**, further comprising:

i) placing sandbags on top of the impermeable membrane that has been placed over the roof, in order to hold the impermeable membrane on top of the roof.

5. The method of claim **4**, wherein the elongated construction material comprises wood.

6. The method of claim **4**, wherein the elongated construction material comprises a strip of plastic.

7. The method of claim **4**, wherein the fasteners comprise nails.

8. A method for covering at least a portion of a roof of a structure with an impermeable membrane, comprising:

a) placing a strip of the impermeable membrane over the portion of the roof intended to be covered;

b) cutting a length of the strip to accommodate a size of the portion of the roof intended to be covered;

c) draping an end of the strip over a fascia of eaves of the roof;

d) placing first elongated construction material on the end of the strip contacting the fascia of eaves of the roof;

e) attaching the first elongated construction material to the fascia of eaves of the roof using a plurality of fasteners;

f) placing second elongated construction material on the impermeable membrane contacting a valley of the roof;

g) attaching the second elongated construction material to the valley of the roof using a plurality of fasteners; and

h) repeating steps a) through g) until the portion of the roof is covered in the impermeable membrane.

9. The method of claim **8**, further comprising:

i) overlapping at least three inches of a first strip of the impermeable membrane that has been placed over the roof with a second strip of the impermeable membrane that has been placed over the roof.

10. The method of claim **9**, further comprising:

j) applying heat using a heat source to a portion of the first strip that overlaps the second strip, so as to meld the portion of the first strip with the second strip, and applying heat using said heat source to shrink the first strip and the second strip.

11. The method of claim **10**, further comprising:

k) placing sandbags on top of the impermeable membrane that has been placed over the roof, in order to hold the impermeable membrane on top of the roof.

12. The method of claim **8**, further comprising:

i) placing third elongated construction material on the impermeable membrane contacting a boundary between floors of the structure;

j) attaching the third elongated construction material to the boundary of the structure using a plurality of fasteners.

13. The method of claim 12, further comprising:

k) placing fourth elongated construction material on the impermeable membrane contacting a bottom of the structure;

l) attaching the fourth elongated construction material to the bottom of the structure using a plurality of fasteners.

* * * * *

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(54) **VENT FOR SHRINK WRAP ROOF COVER**

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(22) Filed: **Sep. 13, 2021**

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E04D 13/17 (2006.01)
E04D 5/00 (2006.01)

(52) **U.S. Cl.**
CPC ***E04D 13/17*** (2013.01); ***E04D 5/00*** (2013.01)

(58) **Field of Classification Search**
CPC ... E04D 13/17; E04D 5/00; E04B 1/70; E04F 13/007; B65D 77/225; B63B 59/045; E04G 23/0281
See application file for complete search history.

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* cited by examiner

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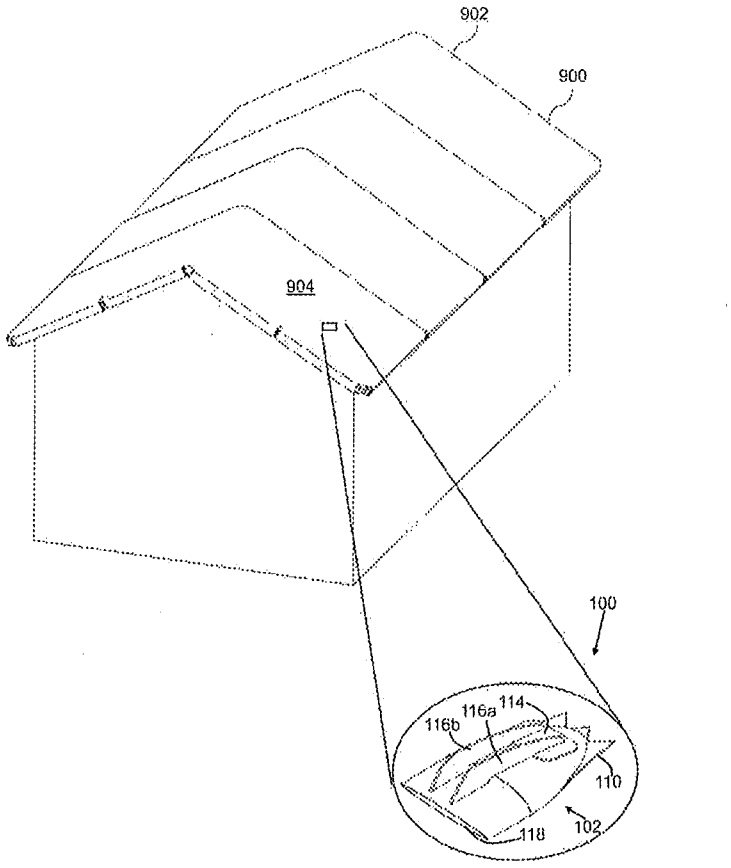
(74) *Attorney, Agent, or Firm* — Mark Terry

(57) **ABSTRACT**

A vent for use in a membrane covering a roof comprises a tubular element having an inner volume, a first end and a second end, a piercing structure located at the first end of the tubular element, a first opening located at a bottom of the tubular element that provides access to the inner volume, a second opening located at the second end of the tubular element that provides access to the inner volume, and a clip located at a top of the tubular element.

20 Claims, 6 Drawing Sheets



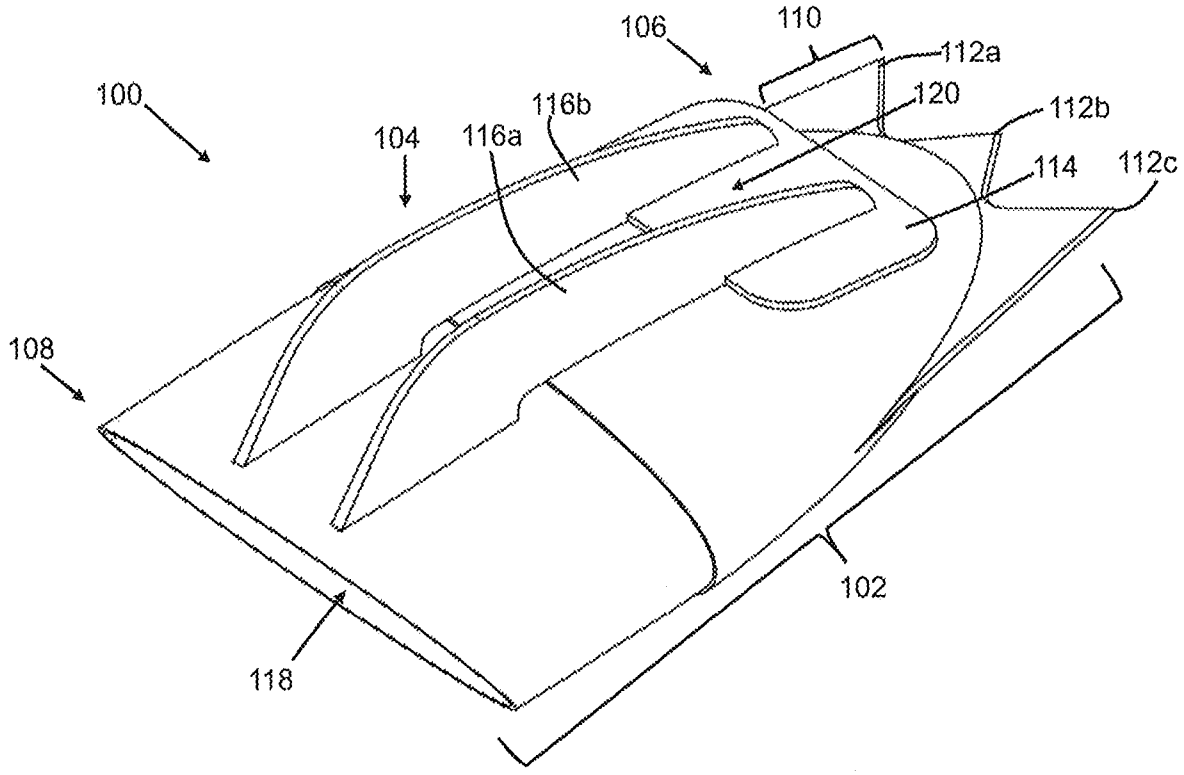

106
110
112a
100
116b
120
112b
104
116a
114
112c
108
102
118

FIG. 1

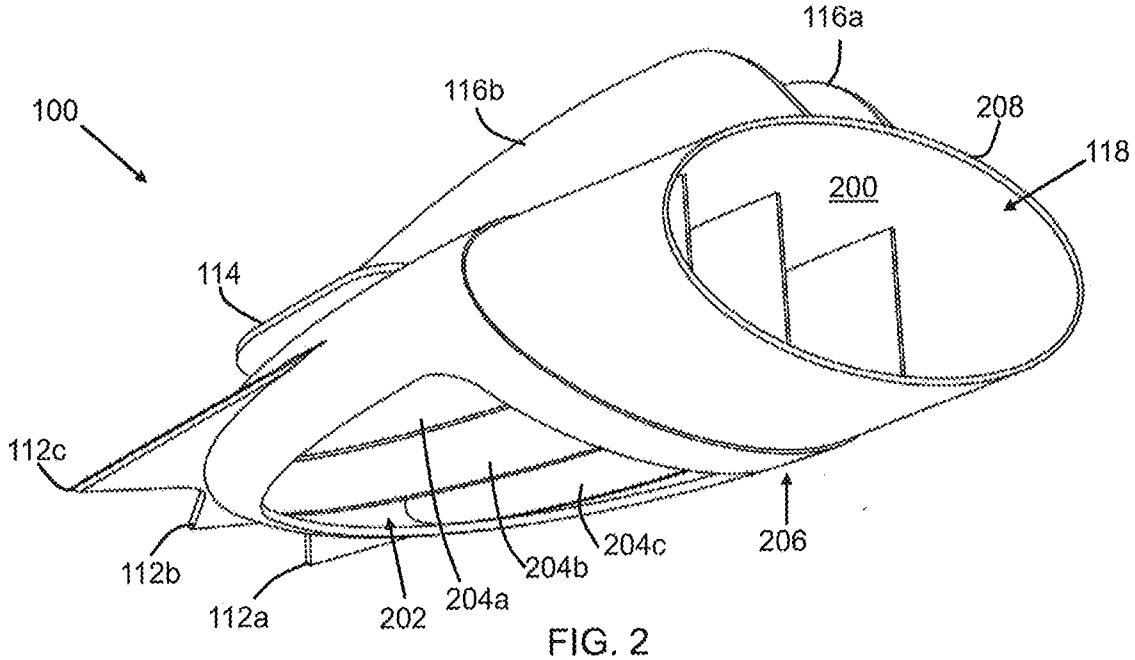

116a
116b
208
100
118
200
114
112c
206
204c
204b
112b
112a
202
204a

FIG. 2

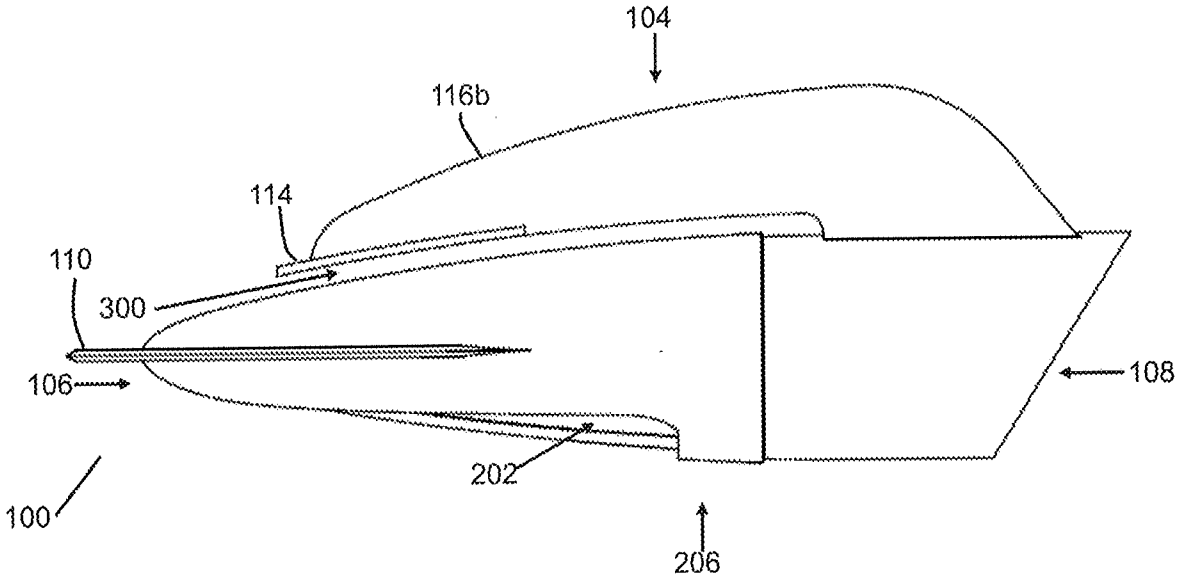

104
116b
114
110
300
106
108
202
100
206

FIG. 3

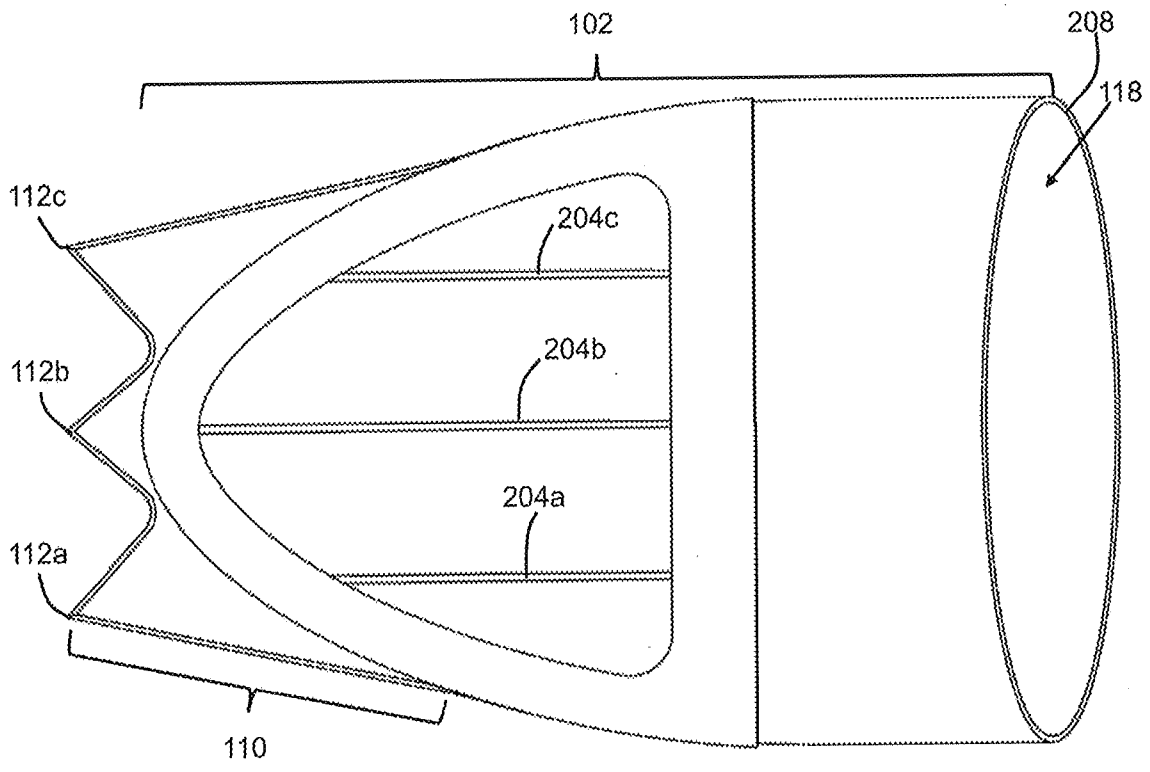

102
208
118
112c
204c
112b
204b
204a
112a
110

FIG. 4

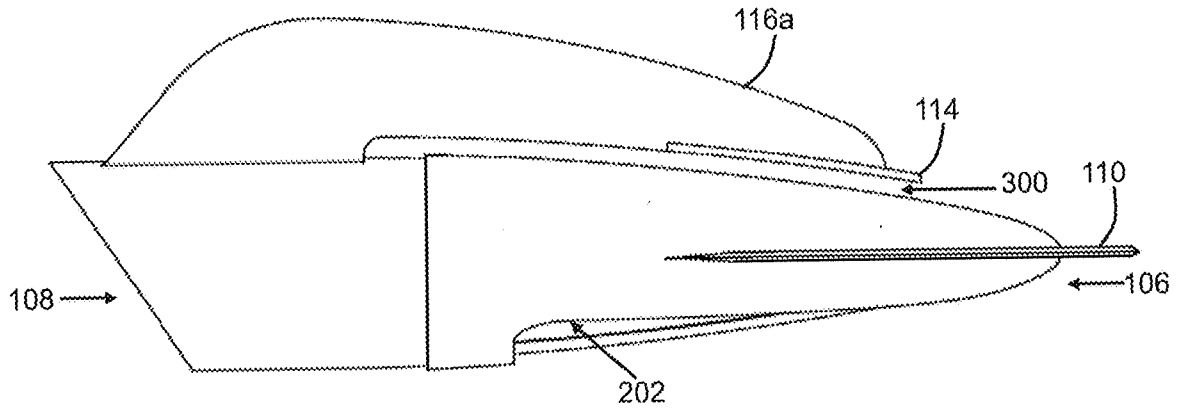


FIG. 5

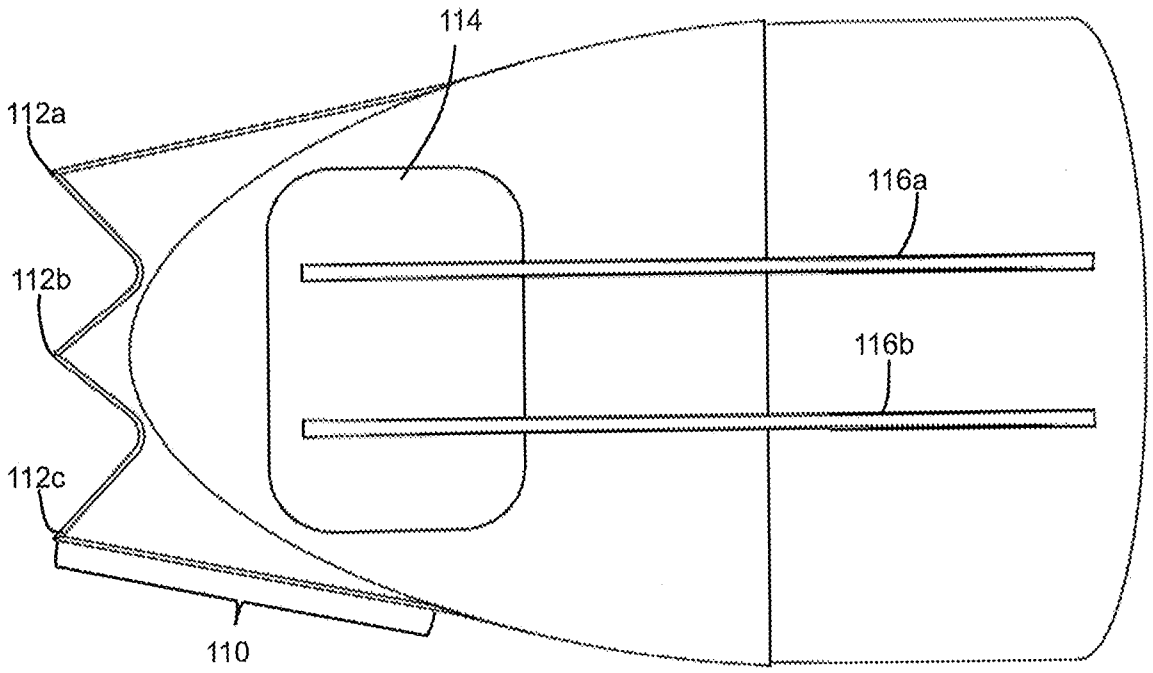


FIG. 6

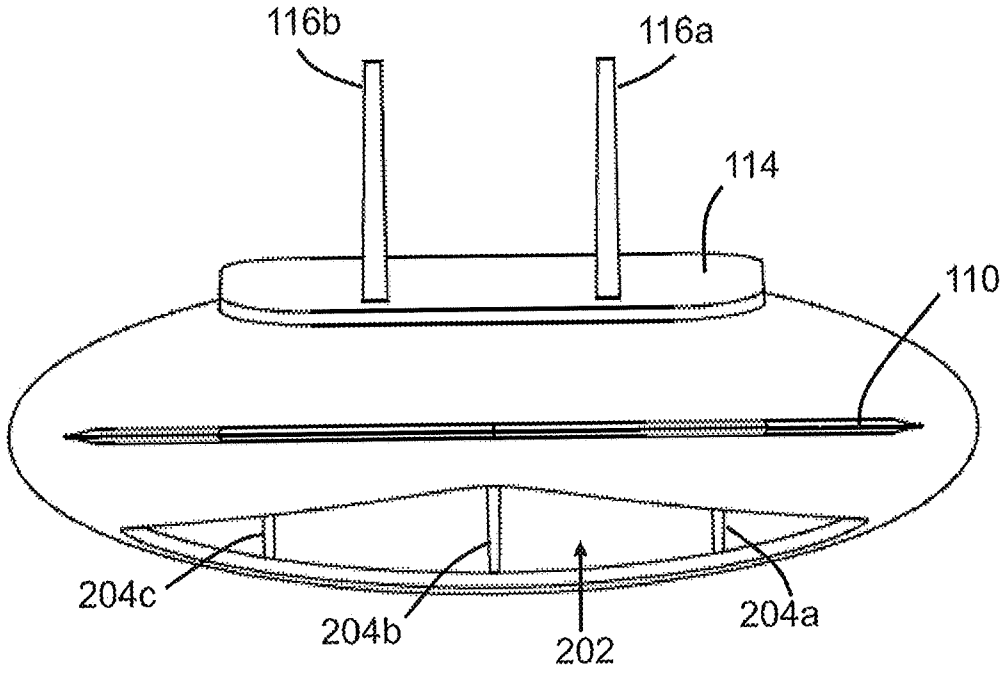

116b
116a
114
110
204c
204b
202
204a

FIG. 7

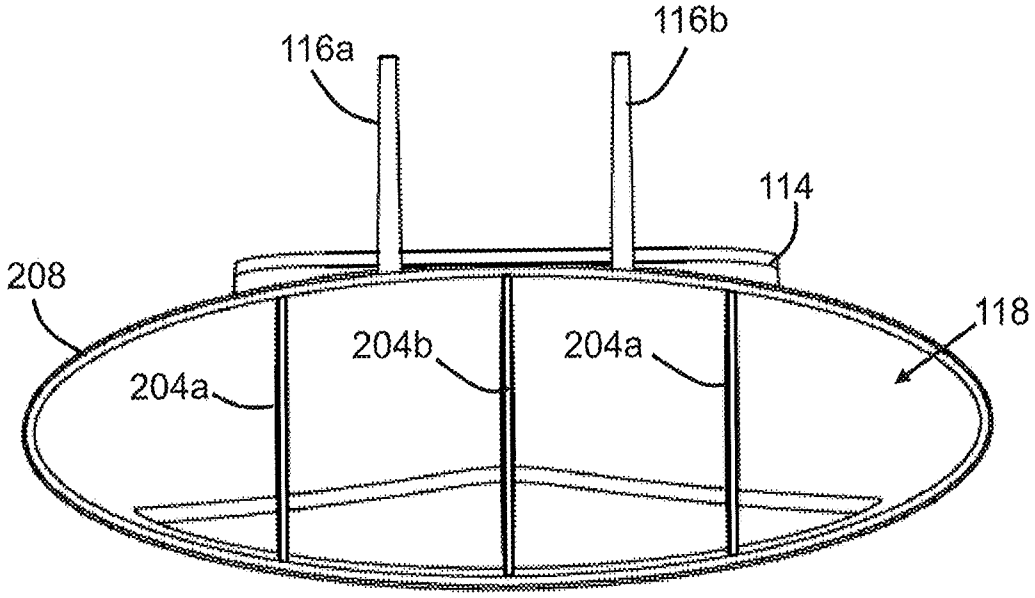

116a
116b
114
208
118
204b
204a
204a

FIG. 8

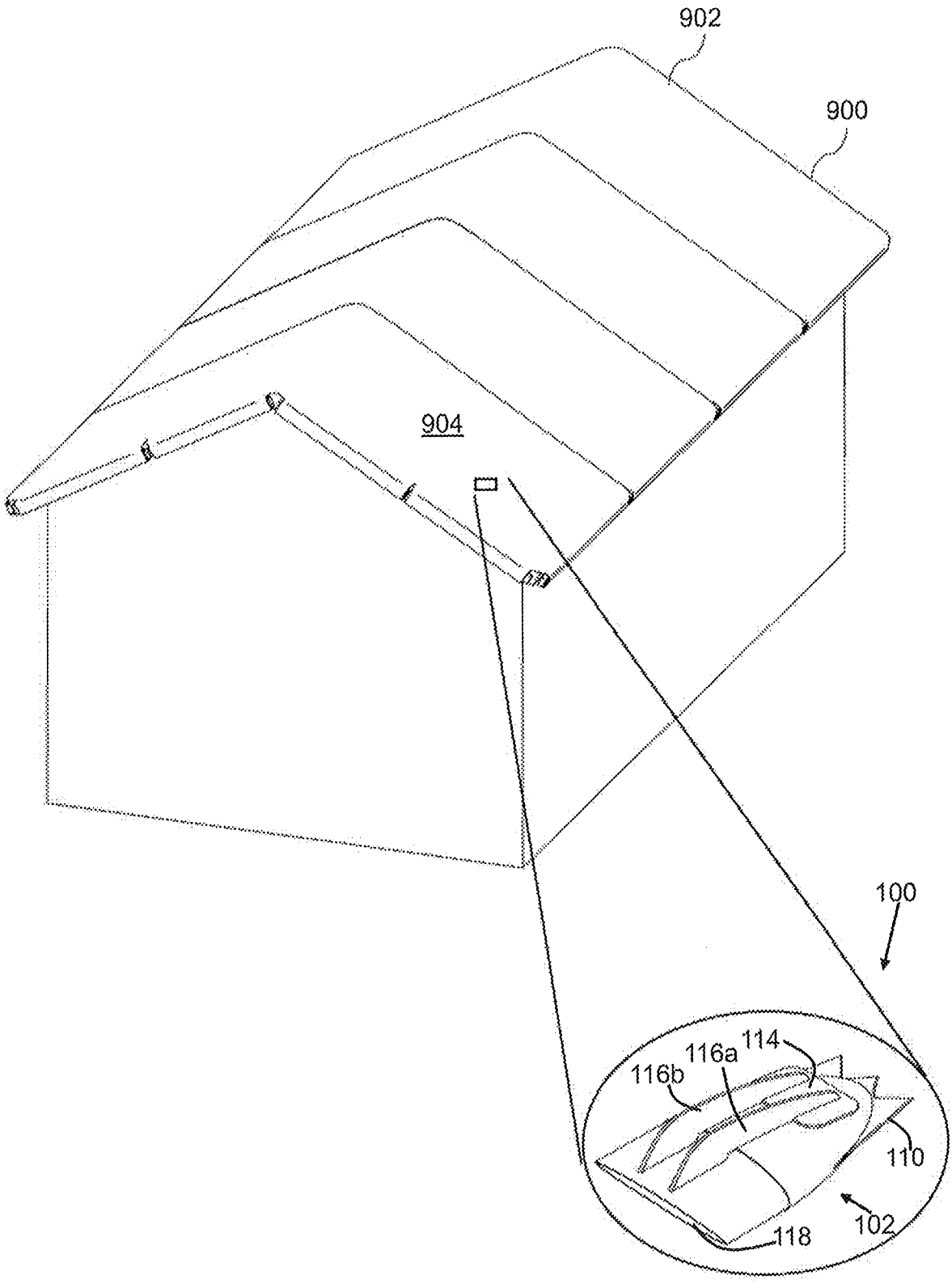


FIG. 9

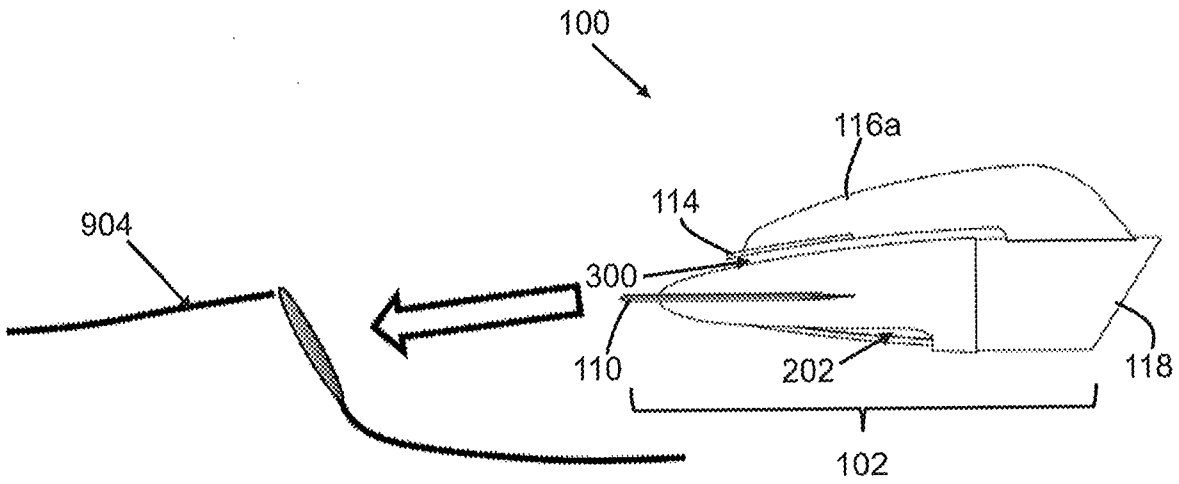


FIG. 10

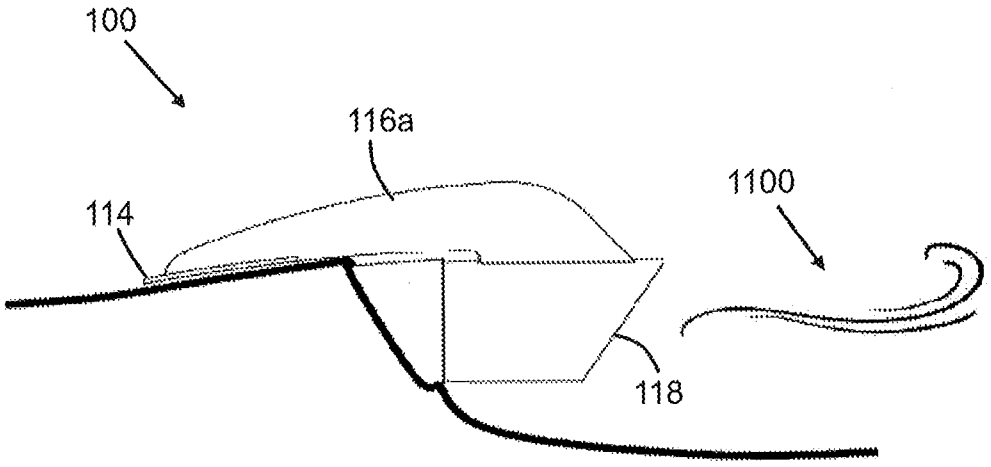


FIG. 11

VENT FOR SHRINK WRAP ROOF COVER

CROSS-REFERENCE TO RELATED APPLICATIONS

This patent application is a continuation in part of, and claims priority to, design patent application 29781991 filed on May 3, 2021. The subject matter of design patent application 29781991 is hereby incorporated by reference in its entirety.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable.

INCORPORATION BY REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

Not Applicable.

TECHNICAL FIELD

The technical field relates generally to the field of residential and commercial structural maintenance and, more specifically, relates to the field of roof maintenance for residential and commercial structures.

BACKGROUND

Maintenance is the process of ensuring that buildings and structures retain a good appearance and operate at optimum efficiency. Inadequate maintenance can result in decay, degradation and reduced performance and can affect health and threaten the safety of users, occupants and others in the vicinity. Building structure, and roofs in particular, are regularly subjected to harsh conditions including wind, rain, snow, heat, cold, and storms. Said conditions can cause damage to the roof, as well as the interior of the structure. For these reasons, roofs require regular maintenance to maintain optimum efficiency and continue to accomplish their design goals.

When roofs suffer significant damage, however, significant construction or refurbishing services may be necessary. This may require a long period of time to accomplish, as contractors must be found and assigned to the job, permits must be obtained, and money must be allocated and transferred. During this period time, the roof cannot be left unattended, as the roof the contents of the structure may suffer further damage. In these situations, therefore, temporary remedial or protective measures are necessary.

Various approaches to this problem have been proposed. A well-known approach to this problem is to attach a temporary water-impermeable membrane, such as shrink wrap, to the exterior of the roof to prevent water from penetrating the roof while it remains damaged. One of the problems associated with this approach is that the roof is completely covered and does not allow for the free flow of gases, which is necessary for plumbing vents, attic vents or other vents. A plumbing vent or plumbing vent pipe is designed to regulate the air pressure throughout a plumbing system and helps remove gas and odors common with a plumbing system, allowing fresh air into the system to help keep the building from smelling and to help water flow smoothly down the drain and out of the building. Attic vents allow cool air to enter the attic and allow hot air to escape.

When plumbing vents, attic vents or other vents are obstructed and gases are not allowed to flow freely therethrough, negative effects may occur, such as improper odors, gas buildup, clogged pipes, overheated attics, etc.

Therefore, a need exists to overcome the problems with the prior art as discussed above, and particularly for a more efficient and effective way of applying temporary remedial or protective measures onto a damaged roof.

SUMMARY

An apparatus and system and method for use in a membrane covering a roof is provided. This Summary is provided to introduce a selection of disclosed concepts in a simplified form that are further described below in the Detailed Description including the drawings provided. This Summary is not intended to identify key features or essential features of the claimed subject matter. Nor is this Summary intended to be used to limit the claimed subject matter's scope.

In one embodiment, a vent for use in a membrane covering a roof comprises a tubular element having an inner volume, a first end and a second end, a piercing structure located at the first end of the tubular element, a first opening located at a bottom of the tubular element that provides access to the inner volume, a second opening located at the second end of the tubular element that provides access to the inner volume, and a clip located at a top of the tubular element.

In another embodiment, a system includes a membrane covering a roof, and a vent comprising a tubular element having an inner volume, a first end and a second end, a piercing structure located at the first end of the tubular element, a first opening located at a bottom of the tubular element that provides access to the inner volume, a second opening located at the second end of the tubular element that provides access to the inner volume, and a clip located at a top of the tubular element.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. In the drawings:

FIG. **1** is a top perspective view of an exemplary vent for use in a membrane covering a roof, according to an example embodiment;

FIG. **2** is a bottom perspective view of the vent shown in FIG. **1**, according to an example embodiment;

FIG. **3** is an elevated right-side view of the vent shown in FIG. **1**, according to an example embodiment;

FIG. **4** is a bottom view of the vent shown in FIG. **1**, according to an example embodiment;

FIG. **5** is an elevated left side view of the vent shown in FIG. **1**, according to an example embodiment;

FIG. **6** is a top view of the vent shown in FIG. **1**, according to an example embodiment;

FIG. **7** is rear view of the vent shown in FIG. **1**, according to an example embodiment;

FIG. **8** is a front view of the vent shown in FIG. **1**, according to an example embodiment;

FIG. **9** is an illustration of a perspective view of a residential structure with a damaged roof, showing the shrink wrap completely applied and the vent for roof cover, according to an example embodiment;

FIG. **10** is an illustration of a perspective view of a residential structure with a damaged roof, as the proposed

system and method for temporary protection of a damaged roof is applied, according to an example embodiment; and

FIG. **11** is an illustration of the vent used on a roof cover completely applied to a residential structure, according to an example embodiment.

DETAILED DESCRIPTION

The following detailed description refers to the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the following description to refer to the same or similar elements. While embodiments of the claimed subject matter may be described, modifications, adaptations, and other implementations are possible. For example, substitutions, additions, or modifications may be made to the elements illustrated in the drawings, and the methods described herein may be modified by substituting, reordering, or adding stages to the disclosed methods. Accordingly, the following detailed description does not limit the claimed subject matter. Instead, the proper scope of the claimed subject matter is defined by the appended claims.

The claimed subject matter improves over the prior art by providing an economic, user-friendly and effective way of ventilating plumbing vents, attic vents or other vents on a damaged roof, when the roof has been completely covered by an impermeable membrane. The claimed subject matter is further easy to learn for workers and time-saving to implement. The claimed subject matter further improves over the prior art by providing an instrument for making a hole in the impermeable membrane over the plumbing vents, attic vents or other vents before inserting the claimed vent. The claimed subject matter further improves over the prior art by providing a clip that secures the vent to the impermeable membrane over the plumbing vents, attic vents or other vents.

The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate various example embodiments. The water impermeable membrane disclosed herein may shrink when heat is applied. Namely, when heat is applied to the water impermeable membrane, the material shrinks tightly over whatever it is covering. Further, when heat is applied to the water impermeable membrane, the membrane may become partially liquid or tacky and may meld with a membrane of the same type. That is, when two pieces of said membrane are placed adjacent to one another and heat is applied, the two pieces of the membrane may meld together and become one integrated portion of water impermeable membrane. The water impermeable membrane may be used in a variety of thicknesses, clarities, strengths and shrink ratios. The water impermeable membrane may comprise polyolefin and may be a material made up of polymer plastic film. Polyolefin is a type of polymer produced from a simple olefin (also called an alkene) as a monomer. Other examples of materials used for the water impermeable membrane include PVC, polyethylene, polypropylene, EP/EVA/copolyester/EVA/EP (where EP is ethylene-propylene and EVA is ethylene-vinyl acetate copolymer) and other compositions.

FIG. **1** references a vent **100** for use in a membrane covering a roof. The vent **100** is unique in providing a detachable/portable venting means adapted to penetrate an impermeable membrane **904**, such as shrink wrap, that completely encapsulates a damaged roof **902**. The vent **100** is configured to penetrate the impermeable membrane **904**, approximately above a permanent vent or outlet, such as a plumbing vent, an attic vent, and other vents that form in the roof. The vent **100** aligns into fluid communication with the fixed vent and securely clamps to the impermeable membrane **904**, so as to enable unmanned venting of the gas or fluid **1100**. Put another way, the vent **100** has the capacity to penetrate the impermeable membrane **904** from a first end **106**, receive the gas or fluid through a first opening, carry the gas **1100** through the inner volume of a tubular element **102**, and finally disperse the gas **1100** through a second opening, away from the roof.

Looking now at FIG. **2**, the vent **100** comprises a tubular element **102** having an inner volume **200**. In some embodiments, the tubular element **102** defines an elliptical cross section. Such an elliptical shaped volume provides sufficient space for venting heavier gases, including toxic gases. In other embodiments, the tubular element **102** defines a substantially semicircular shape when viewed from above, such that the first end **106** is substantially rounded at the terminal edges.

Further, the use of an elliptical cross section serves to create a low profile that enables the tubular element **102** to have partial entry between the impermeable membrane **904** and the damaged roof **902**. For example, a 3" long, and 6" high tubular element is sized to easily slide between the impermeable membrane **904** and the damaged roof **902**, while still providing sufficient volume for carrying away the vented gas or fluid **1100**. However, in alternative embodiments, the tubular element **102** may have more geometric surfaces, including an elongated rectangle, an elongated triangle, or irregular shapes.

Looking now at FIG. **3**, the tubular element **102** defines a first end **106** and an opposing second end **108**. In general, the first end **106** serves as the inlet for the vented gas, and the second end **108** is the gas outlet during the venting process. The ends **106**, **108** are in fluid communication through an inner volume **200** of tubular element **102**. Put another way, the first end **106** fits snugly between the impermeable membrane **904** and the roof **902** to receive the gas **1100** from the fixed vent in the roof; and the second end **108** projects outwardly from the impermeable membrane **904** to disperse the gas **1100**, away from the roof **902** (See FIG. **11**).

As illustrated in FIG. **4**, the tubular element **102** also includes a longitudinal axis, whereby the tubular element is generally elongated. A first opening **202** forms in the first end **106**, at a bottom **206** of the tubular element **102**. The bottom **206** of tubular element **102** orients to face the roof **902**. The first opening **202** is sized and dimensioned to provide access to the inner volume **200**.

The second opening **118** generally follows the cross-sectional shape of the elliptical tubular element **102**. Further, the second opening **118** defines a brim **208**, or terminal edge. The brim **208** is configured to form a plane that intersects the longitudinal axis at about a 45° angle. As FIG. **5** shows, the 45° angle allows the top of the tubular element **102** to extend further than the bottom **206** of the tubular element **102**, at the brim **208**. This angled configuration at the brim **208** helps funnel the vented gas **1100** downwardly, and along the top surface of the impermeable membrane **904**.

As discussed above, the impermeable membrane **904** has a thickness and durability that prevents tearing, so as to securely encapsulate the damaged roof. Thus, to introduce the first end **106** of the tubular element **102** between the impermeable membrane **904** and the roof **902** for venting purposes, a piercing structure **110** is utilized. The piercing structure **110** is disposed at the first end **106** of the tubular element **102** (See FIG. **6**).

As the name implies, the piercing structure **110** is configured to enable a user to forcibly urge the first end **106** of

tubular element **102** through the impermeable membrane **904**, approximately aligning with the fixed vent in the roof. In one non-limiting embodiment, the piercing structure **110** is a generally flat structure that projects from a central area, and beyond the first end **106** for the tubular element **102**. The piercing structure **110** comprises one or more pointed protrusions **112***a-c*. In one non-limiting embodiment, three pointed protrusions **112***a*, **112***b*, **112***c* project from the terminus of the piercing structure **110**. The piercing structure **110** is configured to enable a user to forcibly urge the first end **106** of tubular element **102** through the impermeable membrane **904** and make a hole or orifice in the membrane.

FIG. **5** shows that the tubular element **102** includes a longitudinal axis that extends from first end **106** to second end **108**. The opening **118** further comprises a circular or elliptical brim **208** in a plane that intersects the longitudinal axis at about a forty-five-degree angle. Using this orientation of the brim, rain and other water from the ambient environment cannot fall into the device **100** and onto the residential structure.

Looking now at FIG. **7**, the tubular element **102** defines a first opening **202** located at a bottom **206** of the tubular element **102**. The first opening **202** provides access to the vented gas **1100** into the inner volume **200** of tubular element **102**. The formation of first opening **202** at the bottom **206** of tubular element is a structural advantage that allows tubular element to sit directly on top of fixed vent ion roof. This facilitates aligning the first opening with the fixed vent in roof, so as to enable fluid communication therebetween.

As shown in FIG. **2**, one or more flanges **204***a-c* are disposed in a parallel, spaced-apart relationship within the inner volume **200** of the tubular element **102**. In one non-limiting embodiment, the one or more flanges **204***a-c* comprise three flanges **204***a-c* that are arranged perpendicularly to the top **104** of the tubular element **102**. The three flanges **204***a*, **204***b*, **204***c* extend in a parallel, spaced-apart relationship through the inner volume **200** of the tubular element **102**. The flanges are configured to segregate and guide the vented gas towards the second opening **118** for dispersing away from the roof **902**.

To disperse the vented gas, the tubular element **102** defines a second opening **118** that forms at the second end **108** of the tubular element **102**. The second opening **118** is sized and dimensioned to enable dispersion of the gas passing through the inner volume **200**. In one possible embodiment, the second opening **118** comprises a substantially semicircular shape. This semicircular shape is efficacious for enabling the second opening **118** to optimize dispersion of the vented gas.

Once the first end **106** of the tubular element **102** is snugly fitted between the impermeable membrane **904**, a continuous, uninterrupted venting can occur without supervision.

As FIG. **8** shows, the clip **114** is a planar element arranged parallel to the top **104** of the tubular element **102**. In this arrangement, the clip **114** is spaced-apart from the top of tubular element **102**. The clip **114** is utilized to fasten the tubular element **102** to the impermeable membrane **904**. Use of such a clamping means helps maintain fluid communication between the fixed vent in the roof and the inner volume **200** of the tubular element **102**.

In some embodiments, the clip **114** comprises one or more arms **116***a*, **116***b* that couple to the top **104** of the tubular element **102**, at the second end **108** of the tubular element **102**. The clip **114** is located at the end of the arms **116***a*, **116***b*. Each of the arms **116***a*, **116***b* comprises a planar element arranged perpendicularly to the top **104** of the tubular element **102**. The arms **116***a*, **116***b* extend toward the first end **106** of the tubular element **102**, from the top **104** of the tubular element **102**. In one embodiment, two arms **116***a*, **116***b* extend toward the first end **106** of tubular element **102**. However, in alternative embodiments, more than two arms may be used. At the end of the arms **116***a*, **116***b* is a plate **120**.

As FIG. **3** illustrates, a uniform gap **300** forms between the two arms **116***a*, **116***b* and the top **104** of the tubular element **102**. The gap **300** is sized and dimensioned to introduce the impermeable membrane **904** therein. In some embodiments, the arms **116***a-b* may have a mechanical tension that biases the clip **114** downwardly, towards the top **104** of the tubular element **102**, creating a clamping effect. The arms **116***a-b* can be forcibly raised to enable introduction of the impermeable membrane **904** and the roof **902** into the gap **300**. Once the tubular element positions into fluid communication with the fixed vent in the roof, the arms **116***a-b* may be released to clamp the clip **114** onto the impermeable membrane **904**.

FIG. **9** is an illustration of a perspective view of the residential structure **900** with a damaged roof **902**, showing an impermeable membrane **904**, such as shrink wrap, completely applied to the damaged roof, according to an example embodiment. FIG. **9** shows that multiple rolls of the impermeable membrane **904** have been draped on top of the damaged roof **902** of the residential structure **900** in the same direction and the sides of each unrolled strip of impermeable membrane **904** have been melded to adjacent unrolled strips of impermeable membrane, such that the entire roof **902** is covered in the impermeable membrane. FIG. **9** shows that construction material on the eaves of the roof has been wrapped in the end of the unrolled strip in a clockwise direction so that the open end of the roll faces downwards. This reduces or eliminates the pooling of water in the open end of the roll.

FIGS. **10-11** illustrate the operation of a vent **100** in venting gases from inside a residential house **900** through an impermeable membrane **904** that covers the roof **902**. As illustrated a first end of the tubular element **102** orients towards the roof, approximately above the fixed vent in the roof (FIG. **10**). In one exemplary operational process, the impermeable membrane **904** can be raised and formed to better receive the first end of the tubular element **102**. The piercing structure **110** at the first end is positioned to be forcibly urged through the impermeable membrane **904**. FIG. **10** shows that a hole or orifice has been made in the impermeable membrane **904** by the piercing structure **110**.

Looking now at FIG. **11**, the first end of tubular element **102** has been introduced between the impermeable membrane **904** and the roof **902** via the hole or orifice made in the impermeable membrane **904** by the piercing structure **110**. The vent **100** is in alignment and fluid communication with the fixed vent. The gas or fluid may then flow through the first opening at the bottom of the tubular element, through the inner volume, before dispersing out the second opening at the second end of the tubular element. Once the venting is completed, the tubular element **102** may be removed, and if necessary, the impermeable membrane **904** can be patched to reseal the roof contained therein. The vent **100** may then be applied to another fixed vent on the same roof or used universally across different roofs.

FIG. **11** shows that the clip **114** is utilized to fasten the tubular element **102** to the impermeable membrane **904** and the clip lays on top of the membrane. FIG. **11** also shows the

gas **1100** venting through the inner volume of tubular element **102**, and the gas **1100** dispersing through the second opening, away from the roof.

Embodiments may be described above with reference to functions or acts, which comprise methods. The functions/acts noted above may occur out of the order as shown or described. For example, two functions/acts shown or described in succession may in fact be executed substantially concurrently or the functions/acts may sometimes be executed in the reverse order, depending upon the functionality/acts involved. While certain embodiments have been described, other embodiments may exist. Further, the disclosed methods' functions/acts may be modified in any manner, including by reordering functions/acts and/or inserting or deleting functions/acts, without departing from the spirit of the claimed subject matter.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A vent for use in a membrane covering a roof, comprising:

a) a tubular element having an inner volume, a first end and a second end;

b) a piercing structure located at the first end of the tubular element;

c) a first opening located at a bottom of the tubular element that provides access to the inner volume;

d) a second opening located at the second end of the tubular element that provides access to the inner volume; and

e) a clip located at a top of the tubular element.

2. The vent of claim **1**, wherein the tubular element further comprises an elliptical cross section.

3. The vent of claim **2**, wherein the tubular element further comprises a substantially semicircular shape when viewed from above, wherein the first end is substantially rounded.

4. The vent of claim **3**, wherein the piercing structure further comprises one or more pointed protrusions.

5. The vent of claim **4**, wherein the tubular element includes a longitudinal axis and wherein the first opening further comprises a brim having a plane that intersects the longitudinal axis at about a forty-five-degree angle.

6. The vent of claim **5**, wherein the second opening comprises a substantially semicircular shape.

7. The vent of claim **6**, wherein the clip comprises one or more arms coupled to the top of the tubular element at the second end, wherein the one or more arms extend toward the first end with a uniform gap between the one or more arms and the top of the tubular element.

8. The vent of claim **7**, wherein each of the one or more arms comprises a planar element arranged perpendicularly to the top of the tubular element.

9. The vent of claim **8**, further comprising a clip end located at an end of the one or more arms.

10. The vent of claim **9**, wherein the clip end is a planar element arranged parallel to the top of the tubular element.

11. The vent of claim **7**, wherein the clip comprises two arms coupled to the top of the tubular element at the second end, wherein the two arms extend toward the first end with a uniform gap between the two arms and the top of the tubular element.

12. The vent of claim **11**, wherein each of the two arms comprises a planar element arranged perpendicularly to the top of the tubular element.

13. The vent of claim **12**, further comprising a clip end located at an end of the two arms.

14. The vent of claim **13**, wherein the clip end is a planar element arranged parallel to the top of the tubular element.

15. The vent of claim **7**, further comprising one or more flanges located within the inner volume.

16. The vent of claim **15**, wherein the one or more flanges comprises three flanges arranged perpendicularly to the top of the tubular element.

17. A vent for use in a membrane covering a roof, comprising:

a) a tubular element having an inner volume, a first end and a second end;

b) a piercing structure located at the first end of the tubular element;

c) a first opening located at a bottom of the tubular element that provides access to the inner volume;

d) an elliptical opening located at the second end of the tubular element that provides access to the inner volume; and

e) a clip located at a top of the tubular element;

f) wherein when the first end of the of the tubular element is inserted into the membrane, the clip lays on top of the membrane, the first opening is located inside of the membrane and the elliptical opening is located outside of the membrane.

18. The vent of claim **17**, wherein the tubular element further comprises a substantially semicircular shape when viewed from above, wherein the first end is substantially rounded.

19. The vent of claim **18**, wherein the piercing structure further comprises one or more pointed protrusions.

20. The vent of claim **19**, wherein the tubular element includes a longitudinal axis and wherein the first opening further comprises a brim having a plane that intersects the longitudinal axis at about a forty-five-degree angle.

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