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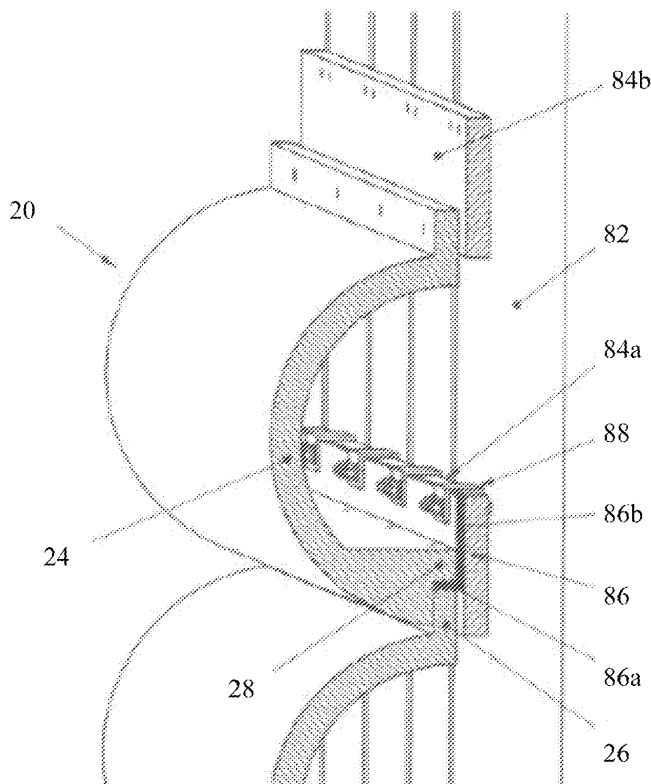
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(54) **Log look log**

(57) A simulated log structure is provided. The simulated log structure is made up of a plurality of structural elements wherein each structural element is composed of a plurality of exterior simulated log elements and a plurality of interior log elements. The exterior simulated

log elements simulate the appearance of wooden logs and are made from concrete to withstand the natural elements. The interior log elements are made of real wood to provide owners the authentic feel of living in a real log structure.



**FIG. 8**

## Description

### CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** This application claims the benefit of U.S. Provisional Application No. 61/272,551, filed October 6, 2009, which is hereby incorporated by reference.

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention:

**[0002]** The present invention relates generally to structures composed of wooden log elements, and more particularly, it relates to structures composed of simulated log components that visually appear like wooden logs.

#### 2. Description of the Related Art

**[0003]** Log structures such as log homes and cabins are steeped in tradition and have come to symbolize warmth, comfort, and craftsmanship. The rustic appeal and natural beauty of wooden log homes and the time honored heritage and art of constructing quality log structures are only a few reasons why log homes continue to be desired as a popular housing choice. With modern techniques and advanced machinery, the construction of traditional log homes and cabins can range from being elaborate and luxurious dream home to simple do-it-yourself, premanufactured log home kits for a starter home.

**[0004]** Society is becoming more and more environmentally conscious and aware of the ecological consequences of excessive consumption of natural resources. As a result, the cutting down of trees, especially old growth trees, to obtain quality lumber to construct log structures are increasingly socially frowned upon and considered environmentally irresponsible.

**[0005]** In addition to the social criticism associated with obtaining the requisite lumber for constructing log structures, traditional log structures are not particularly well suited in certain environments. For example, logs constantly shrink and swell due to changes in moisture content brought on by varying weather patterns. Although log components may be protected and sealed to minimize the effects of moisture change, depending on the environment, seasonal fluctuations in relative humidity may test any finish and/or sealant designed to protect and maintain the log. Over a period of time, high humidity may lead to wood rot and low humidity may lead to cracking of the wood.

**[0006]** High moisture content is also associated with other problems that may compromise the integrity of a log structure. For example, wood destroying fungi and pests such as termites, carpenter ants, and various beetles consume material in the wood cell wall structure, thereby causing decay. Resident insect larvae can live dormant within a log for many years prior to becoming active, and fungi can similarly remain dormant until prop-

er conditions cause the fungi to start or resume its decay activity.

**[0007]** As such, routine and regular maintenance of log structure is essential in order to preserve its natural beauty and to ensure its integrity and lifespan. For example, log homes need to be refinished every couple of years, they need to be regularly inspected for cracks, seals need to be maintained to prevent rot and decay, and the grounds surrounding the log home may need to be treated to discourage pests. Hence, maintenance of log home can be labor intensive and costly.

**[0008]** It is also difficult to incorporate modern building standards and preferences in log homes. Energy efficiency may vary depending on the design and construction method. Windows, doors, and skylights may raise utility bills if sealing is not properly done. Log homes with many corners, joints, and roof angles can consume more energy than log homes with simpler designs. Installation of plumbing, electricity, and heating may pose some challenges, and the insulative properties of log structures are also debatable.

**[0009]** Simulated log construction material is known in the art to overcome the disadvantages generally associated with a log structure. For example, applicant is aware of U.S. Pat. No. 6,851,233 issued on Feb. 8, 2005 to Morgenstern which describes a structural system having a plurality of structural elements including an interior layer, an exterior layer, and an insulating layer between the interior and exterior layer. The exterior layers of the structural elements can be fabricated from cast concrete material and can be provided with simulative exterior surfaces simulating the appearance of structural logs.

**[0010]** Applicant is further aware of U.S. Pat. No. 5,271,878 issued on Dec. 21, 1993 to Mizia et al. which describes a simulated half log having a generally semi-cylindrical foam core and a decorative layer on the curved surface. Complementary nailable spines are inset in the flat surface, permitting adjacent half logs to interlock. One spline which extends beyond the edge provides a surface for nailing to a vertical substrate and is concealed when the next adjacent half log is mounted thereover.

**[0011]** Applicant is also aware of U.S. Pat. No. 4,305,238 issued on Dec. 15, 1981 to Harward et al. which describes a simulated log for construction and indoor or outdoor decorative use wherein the log is comprised of at least two semi-circular imitation log siding sections comprising an outer covering with a simulated grain wood containing an insulated filler.

**[0012]** The problem with existing prior art is that none of the simulated logs describe a construction that allows the user to enjoy the natural beauty and comforts of a traditional log home. The prior art describes the use of building materials that simulate the appearance of log structures but fail to describe a structure that provides the warmth, comfort, and craftsmanship associated with log structures. Owners of log structures desire the rustic appeal and natural beauty of wooden log homes. Wholly simulated log structures fail to connote the sense of nos-

talgia and fall short of honoring the heritage, history, and culture associated with a genuine log structure. Therefore, an unaddressed need for an improved simulated log structure exists to overcome the inadequacies and deficiencies in the prior art.

**[0013]** The problems and the associated solutions presented in this section could be or could have been pursued, but they are not necessarily approaches that have been previously conceived or pursued. Therefore, unless otherwise indicated, it should not be assumed that any of the approaches presented in this section qualify as prior art merely by virtue of their presence in this section of the application.

#### BRIEF SUMMARY OF THE INVENTION

**[0014]** It is an object of the present invention to provide a simulated log structure without the maintenance requirements typically associated with a log structure.

**[0015]** It is another object of the present invention to provide a simulated log structure that allows user to enjoy the natural beauty of a real log structure.

**[0016]** It is another object of the present invention to provide a simulated log structure that is durable and easy to construct and incorporates advantages of modern day construction elements.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0017]** For exemplification purposes, and not for limitation purposes, embodiments of the invention are illustrated in the figures of the accompanying drawings, in which:

**[0018]** FIG. 1 is a perspective view of a structure made in accordance with the invention;

**[0019]** FIG. 2 is a front view of a structural element;

**[0020]** FIG. 3 is a perspective interior view of an exterior simulated log;

**[0021]** FIG. 4 is a perspective exterior view of the exterior simulated log as seen in FIG. 2;

**[0022]** FIG. 5 is a sectional view of an embodiment of a structural element having the exterior simulated log, as seen in FIG. 2, mounted with a first side and an interior simulated log mounted with a second side opposite the first side in an aligned configuration;

**[0023]** FIG. 6 is a sectional view of an alternative embodiment of a structural element having the exterior simulated log, as seen in FIG. 2, mounted with a first side and an interior wooden log mounted with a second side opposite the first side in a staggered configuration;

**[0024]** FIG. 7 is a sectional view of an alternative embodiment of a structural element having the exterior simulated log, as seen in FIG. 2, mounted with a first side and an interior wooden log mounted with a second side opposite the first side in an aligned configuration;

**[0025]** FIG. 8 is a cross-sectional view of an embodiment of securing exterior simulated log onto a frame; and

**[0026]** FIG. 9 is a rear sectional view of the embodi-

ment of securing exterior simulated log onto a frame, as seen in FIG. 8.

#### DETAILED DESCRIPTION OF THE INVENTION

**[0027]** What follows is a detailed description of specific embodiments of the invention in which the invention may be practiced. Reference will be made to the attached drawings, and the information included in the drawings is part of this detailed description. The specific embodiments of the invention, which will be described herein, are presented for exemplification purposes, and not for limitation purposes. It should be understood that structural and/or logical modifications could be made by someone of ordinary skills in the art without departing from the scope of the present invention. Therefore, the scope of the present invention is defined only by the accompanying claims and their equivalents.

**[0028]** As seen in Figs. 1 to 9, a simulated log structure 1 comprises a plurality of structural elements 100 wherein each structural element 100 is comprised of a plurality of exterior logs 20 mounted on a first side of structural element 100 and a plurality of interior logs 40 mounted with a second side of structural element 100 opposite the first side.

**[0029]** In a preferred embodiment of the present invention, exterior logs 20 simulate the character, texture, appearance and appeal of wooden logs and is made from composite materials such as but not limited to reinforced precast concrete. Concrete as a construction material for structures is known to be a relatively good insulator as it absorbs heat during the day and releases it slowly as temperatures cool, providing even indoor temperature. Other composite materials such as but not limited to plastic and wood fiber composites are contemplated and within the scope of the present invention. Advantageously, exterior logs 20 made from concrete virtually eliminate the typical problems associated with a real wood log structure, such as environmental concerns, instability due to shrinking and swelling, costly and regular maintenance, and susceptibility to the fire, fungi, and wood-boring insects. In addition to the benefit of greater structural stability, concrete eliminates the need to re-stain and reseal wood logs to retain protection from weather and insects. Furthermore, concrete is fire-resistant and resistant to deterioration, insect infestation, and mold growth.

**[0030]** As seen in Figs. 3, 4, and 5, each exterior log 20 is a semi-cylindrical half log having a flat side 22 and a curved face 24 with flat side 22 and curved face 24 meeting at top edge 26 and bottom edge 28, as described in greater detail below. Curved face 24 and the visible ends of exterior logs 20 are molded to resemble wooden log surfaces. Advantageously and unlike prior art composite log structures, in an embodiment of the present invention, exterior logs 20 define a central cavity 30. Cavity 30 reduces the weight of exterior logs 20 and may be adapted to receive insulation material 32 so as to provide

insulative properties to structural element 100 and any structure constructed of a plurality of structural elements 100. Insulation material 32 may be any known suitable insulation material such as but not limited to polystyrene foam.

**[0031]** In an embodiment of the invention, semi-cylindrical molds defining central cavity 30 may be made from actual wooden logs to create a mold for exterior logs 20 such that exterior logs 20 substantially look and feel like an actual wooden log, including grain detail and knots. Molds for exterior simulated logs 20 may be made to measure any length and/or diameter. For example, and without intending to be limiting, molds may be made to produce exterior logs 20 measuring eight inches to sixteen inches in diameter and eight feet to twelve feet in length or up to sixty feet.

**[0032]** As seen in Figs. 3, 4 and 5a, top edge 26 of each exterior log 20 is further comprised of a fastening portion. In an embodiment of the invention, the fastening portion of the top edge takes the form of a flange 26 projecting outwards from the top edge away from the center of exterior log 20. Flange 26 is configured to receive at least one fastening means 27 such as but not limited to nails or screws. As seen in Figs. 5a, 3 and 4, preferably, flange 26 is integrally formed with the first top edge and defines at least one aperture wherein such at least one aperture is adapted to receive fastening means 27 for securing exterior log 20 onto a structure, such as but not limited to a frame described in greater detail below. Flat side 22 of flange 26 enables flange 26 to abut the structure in substantially parallel engagement as described in greater detail below.

**[0033]** As seen in Figs. 3, 4, 5 and 5a, bottom edge 28 of each exterior log 20 is further comprised of a receiving portion configured to receive the fastening portion or flange 26 of an adjacent exterior log 20. In an embodiment of the invention, the receiving portion of bottom edge 28 defines a channel wherein the channel is configured to receive flange 26 such that exterior logs 20 may be mounted adjacent to one another in an abutting or overlapping function onto a structure as described in greater detail below.

**[0034]** In a preferred embodiment of the invention wherein each structural element 100 is comprised of a plurality of exterior logs 20 mounted on a first side of structural element 100 and a plurality of interior logs 40 mounted on a second side of structural element 100 opposite the first side as seen in Figs. 5, 6 and 7, to mount exterior log 20 onto a structure, a frame 80 (Fig. 2) may be provided. In an embodiment of the invention, frame 80 may be comprised of a plurality of support members 82 and a plurality of strapping members 84 (Figs. 8 and 9) mounted perpendicular to the plurality of support members 82. Preferably, the plurality of support members 82 are comprised of dimensional lumber such as two-by-four and the plurality of strapping members 84 are metal strapping members mounted perpendicular with the plurality of support members 82 in a parallel and spaced

apart configuration wherein each adjacent strapping member 84 is virtually equidistant apart from each other.

**[0035]** As seen in Figs. 3, 4, 8 and 9, in an embodiment of the invention at least one angled member 86 may be attached with the channel defined by bottom edge 28 such that a first arm 86a of angled member 86 engages a first side 21 of the channel defined by bottom edge 28 and a second arm 86b of angled member 86 engages flat side 22 and extends upwards from bottom edge 28 inwards the center of exterior log 20. Preferably, angled member 86 is made from a strong and durable material such as metal and may engage the entire length of exterior log 20 or may engage portions of exterior log 20 to reduce weight. Preferably, a plurality of angled members 86 made of iron are attached with exterior log by way of securing members such as screws in spaced apart configuration along the entire length of exterior log 20.

**[0036]** As seen in Figs. 8 and 9 a plurality of U-shaped members 88 configured to engage strapping members 84 may be attached with second arm 86b such that U-shaped member 88 may hook onto a first strapping member 84a to secure bottom edge 28 of exterior log 20 onto frame 80 (Fig. 2). Flange 26 of exterior log 20 (Figs. 3 and 4) may then be secured onto frame 80 by inserting a fastening means into the at least one aperture of flange 26 such that flat side 22 of flange 26 abuts a second strapping member 84b (Fig. 8) immediately adjacent to first strapping member 84a which edge 28 is attached with. Preferably, U-shaped members 88 are made from a strong and durable material such as metal and may engage the entire length of angle member 86 or may engage portions of angle member 86 or engage each of the plurality of angle member 86. Preferably, a plurality of U-shaped members 88 engage each of the plurality of angled members 86 attached in spaced apart configuration along the entire length of exterior log 20. In a preferred embodiment, U-shaped members 88 are welded on to each of the plurality of angled members 86. By successively mounting exterior logs 20 on frame 80 in the above described manner, a first side of structural element 100 may be constructed entirely of logs made from composite materials that substantially looks and feel like an actual wooden log.

**[0037]** As seen in Figs. 6 and 7, mounted on a second side of structural element 100 opposite the first side is a plurality of interior logs 40 wherein interior logs 40 may be made of real wooden logs. When constructing a structure such as a log cabin using the above described structural element 100, interior logs 40 mounted with the second side of structural element 100 forms the interior of the log cabin and exterior logs 20 mounted with the first side of structural element 100 forms the exterior of the log cabin. Advantageously and unlike the prior art, one may enjoy the rustic appeal and natural beauty of living in a log cabin without the worry of typical problems associated with a real wooden log structure. More particularly, when inside the log cabin constructed from the preferred embodiment of structural element 100, because

interior logs 40 are real wooden logs, one may enjoy the benefits of living in a real log home and because exterior logs 20 are mounted on the exterior side of structural element 100, the composite material from which exterior logs 20 are made, virtually eliminates the environmental concerns, maintenance, susceptibility to fire, fungi, and wood-boring insects and other concerns associated with a real wooden log structure.

**[0038]** In an alternative embodiment of the invention, a first exterior log 20 may be mounted on a first side of frame 80 by way of fastening means such as nails. Fastening means may be received in the at least one aperture defined by flange 26 so as to secure first exterior log 20 to frame 80 such that flat side 22 of flange 26 engages strapping member 84 in substantially parallel engagement. A second exterior log 20 may be mounted on frame 80 on a first side adjacent a first exterior simulated log 20 in a similar fashion such that flange 26 of first exterior log 20 is received within channel 28 of second exterior log 20. By mounting subsequent exterior logs 20 in such a manner wherein flange 26 of a previously mounted exterior log 20 is received within channel 28 of a subsequently mounted exterior log 20, a plurality of exterior logs 20 may be mounted adjacent to one another in an abutting or overlapping function onto frame 80 to simulate the appearance of a wooden structural element 100 that may be used to construct, for example, a log cabin that appears to be a wooden log cabin on the exterior.

**[0039]** In a further alternative embodiment, as seen in Fig. 5, if desired, structural element 100 may be comprised of a plurality of exterior logs 20 mounted on a first side and a second side opposite the first side of structural element 100. In such alternative embodiment, a structure such as a log cabin may be constructed entirely of exterior logs 20 that simulate the character, texture, appearance and appeal of wooden logs on the interior and the exterior. Advantageously and unlike the prior art, because the interior and the exterior are made from composite material that simulate real wooden logs, one may enjoy the benefits of living in a log home without having to worry about the typical problems associated with a real wood log structure, such as environmental concerns, instability due to shrinking and swelling, costly and regular maintenance, and susceptibility to fire, fungi, and wood-boring insects.

**[0040]** In the further alternative embodiment, as seen in Fig. 6, exterior simulated logs 20 and interior logs 40 may be mounted as part of structural element 100 in a staggered formation so as to provide greater insulation. Despite this description, it should be appreciated that the type of log mounted on the first side or second side of structural element 100 may be reversed or changed without changing the function or advantages provided.

**[0041]** In another alternative embodiment of the invention, edge 26, 28 of exterior simulated logs 20 may each be comprised of a fastening portion in the form of flange. Preferably, both flanges are integrally formed with edge 26, 28, respectively, and define at least one aperture

wherein such at least one aperture is adapted to receive the fastening means for securing exterior log 20 onto frame 80. A filler such as weather resistant concrete fillers or sealers known in the art may be used to cover the visible heads of the fastening means for aesthetic purposes.

**[0042]** From the foregoing description, it may be seen that the device formed in accordance with the present invention incorporates many novel features and offers significant advantages over those currently available.

**[0043]** Although specific embodiments have been illustrated and described herein for the purpose of disclosing the preferred embodiments, someone of ordinary skills in the art will easily detect alternate embodiments and /or equivalent variations, which may be capable of achieving the same results, and which may be substituted for the specific embodiments illustrated and described herein without departing from the scope of the present invention. Therefore, the scope of this application is intended to cover alternate embodiments and /or equivalent variations of the specific embodiments illustrated and/or described herein. Hence, the scope of the present invention is defined only by the accompanying claims and their equivalents.

## Claims

1. A semi-cylindrical half log made of a composite material, simulating the appearance of a real wooden log, and comprising a central cavity.
2. The semi-cylindrical half log of claim 1, further comprising a fastening portion in the form of a flange at least one of its edges.
3. The semi-cylindrical half log of claim 2, further comprising a receiving portion configured to receive the said fastening portion of an adjacent simulated log.
4. The semi-cylindrical half log of claim 2, wherein said fastening portion comprises at least one aperture, wherein said at least one aperture is adapted to receive fastening means for securing said simulated log onto a structure.
5. The semi-cylindrical half log of claim 3, wherein said receiving portion is adapted to allow the engagement of a first arm of at least one angled member.
6. A structural element comprising:

a frame:

a plurality of semi-cylindrical half logs made of a composite material, each of said logs simulating the appearance of a real wooden log and comprising a central cavity; and.

means for securing said logs onto said frame.

7. The structural element of claim 6, wherein said frame comprises a plurality of support members and a plurality of strapping members. 5
8. The structural element of claim 7, wherein said plurality of strapping members is mounted perpendicular to said plurality of support members. 10
9. The structural element of claim 6, wherein said plurality of semi-cylindrical half logs made of a composite material is mounted on a first said of said frame and a plurality of wooden logs is mounted on a second side of said frame, opposite the first side, in an aligned configuration. 15
10. The structural element of claim 6, said plurality of semi-cylindrical half logs made of a composite material is mounted on a first side of said frame and a plurality of wooden logs is mounted on a second side of said frame, opposite the first side, in a staggered configuration. 20
11. Means for securing semi-cylindrical half logs onto a structure. 25
12. The means of claim 11, wherein said means are concealed after securing said logs onto said structure. 30

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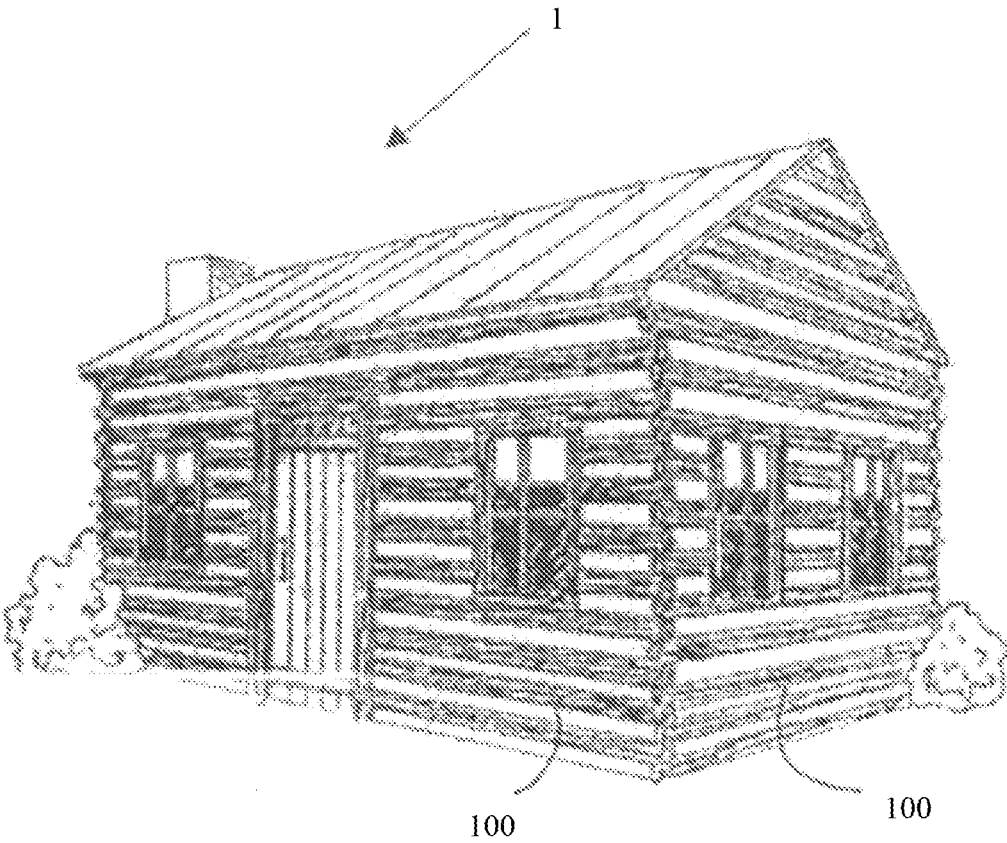


FIG. 1

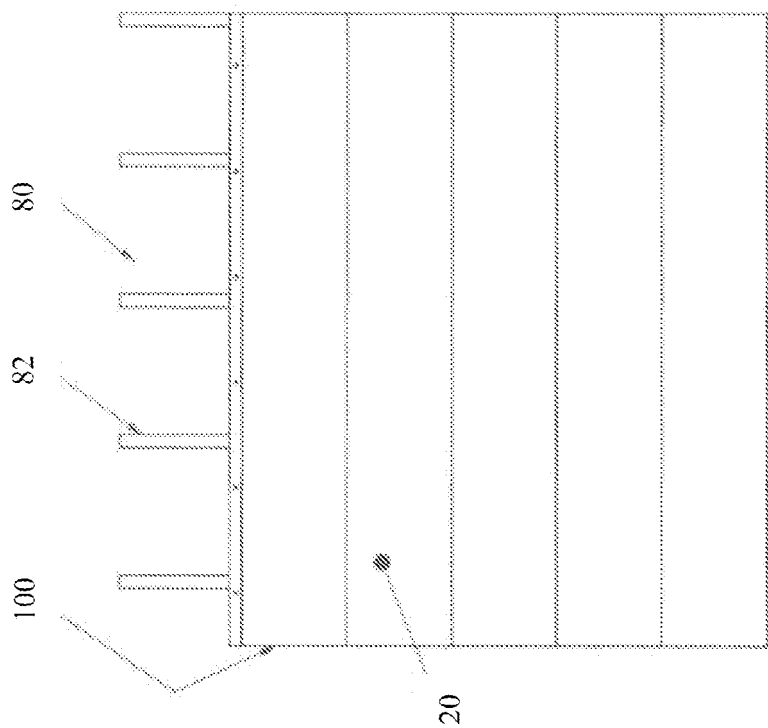


FIG. 2

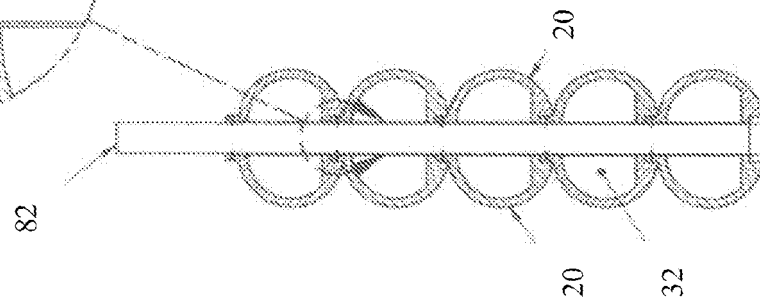


FIG. 5

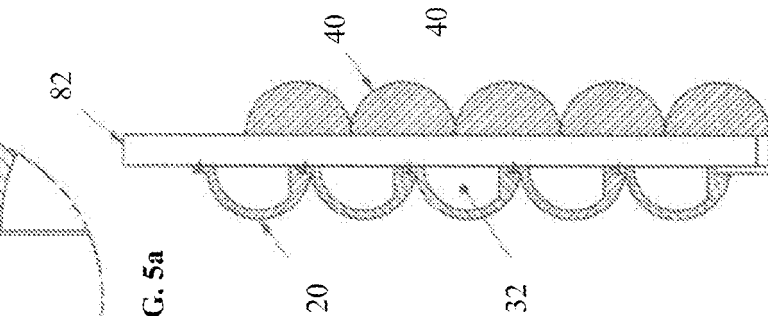


FIG. 6

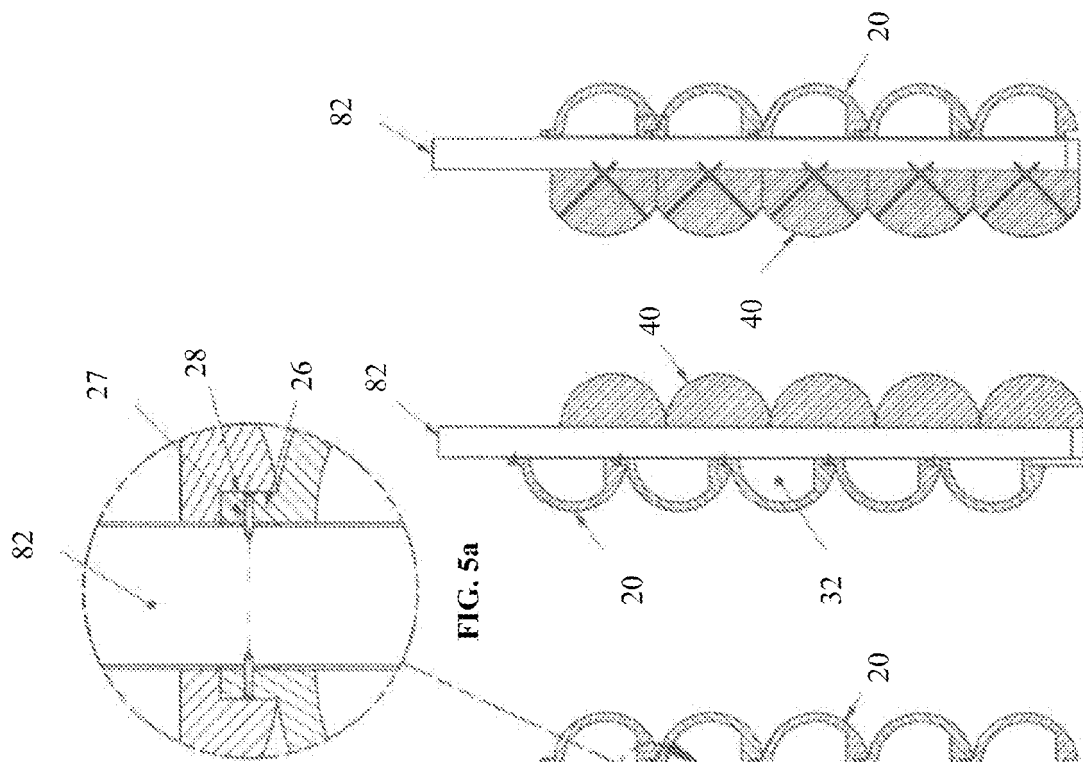


FIG. 7

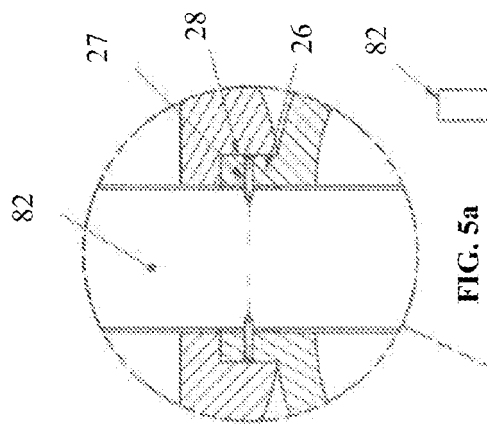
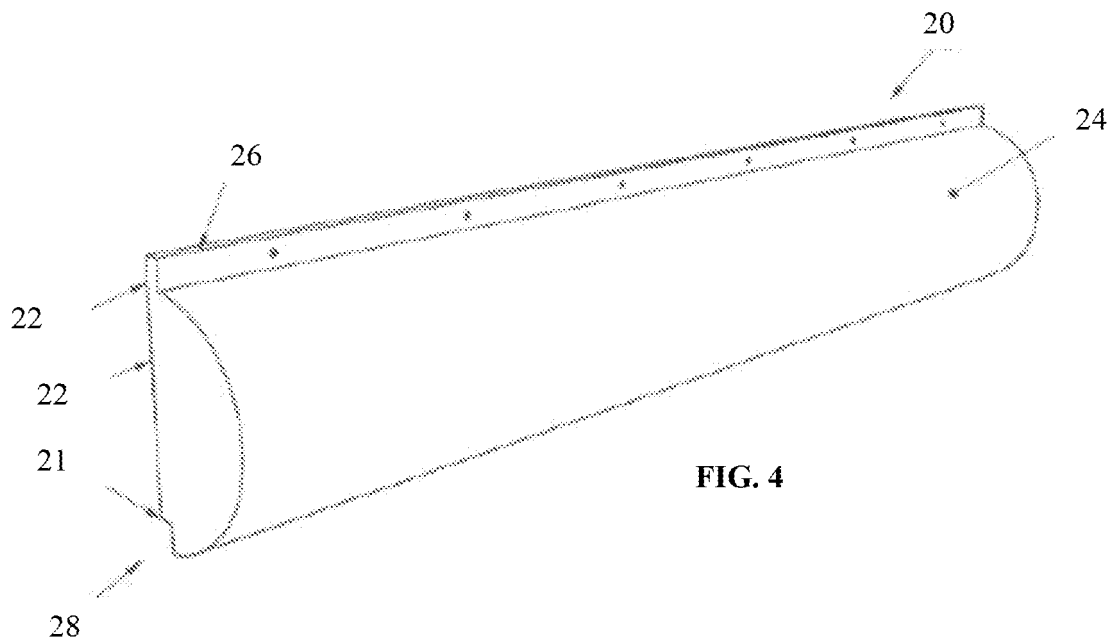
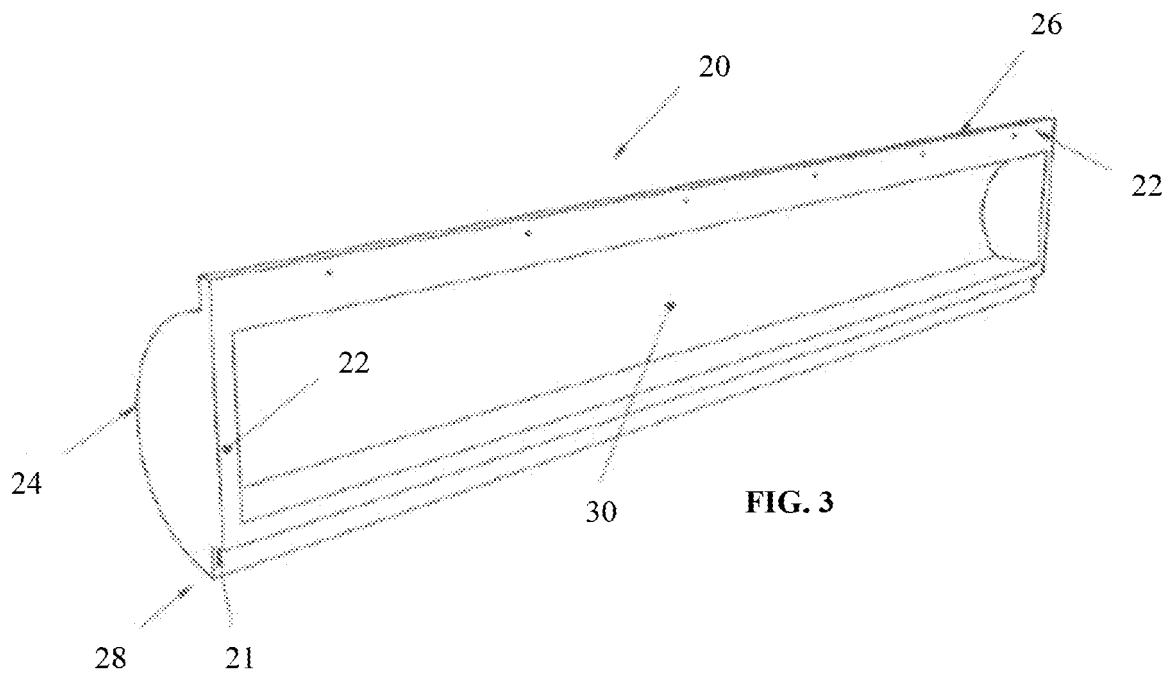


FIG. 5a





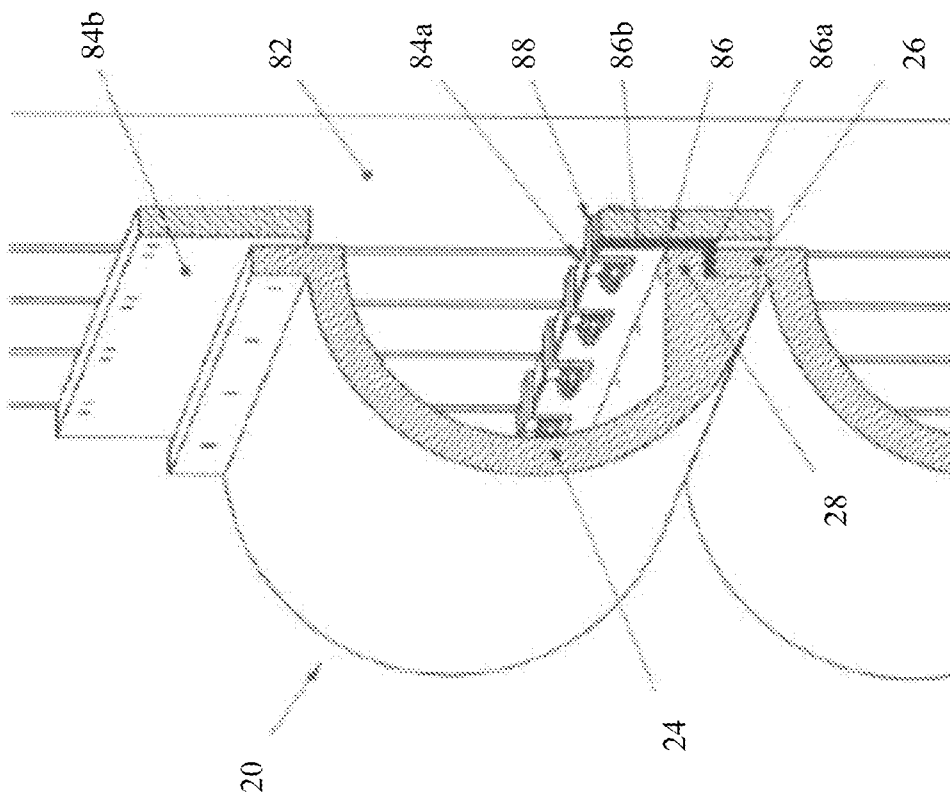


FIG. 8

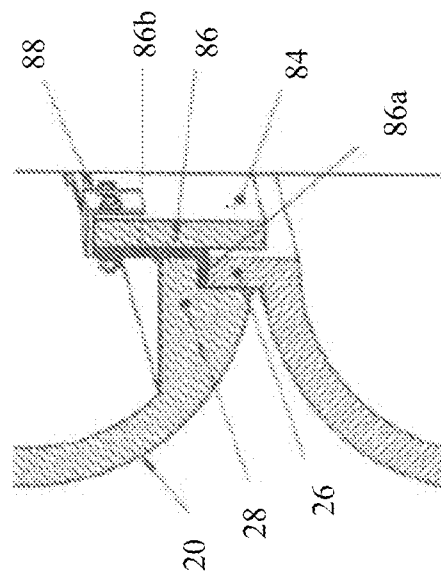


FIG. 9

**REFERENCES CITED IN THE DESCRIPTION**

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