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(54) **COATED INSULATION HANGER**

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(76) Inventor: **Daniel Lee Smith**, Norfolk, VA
(US)

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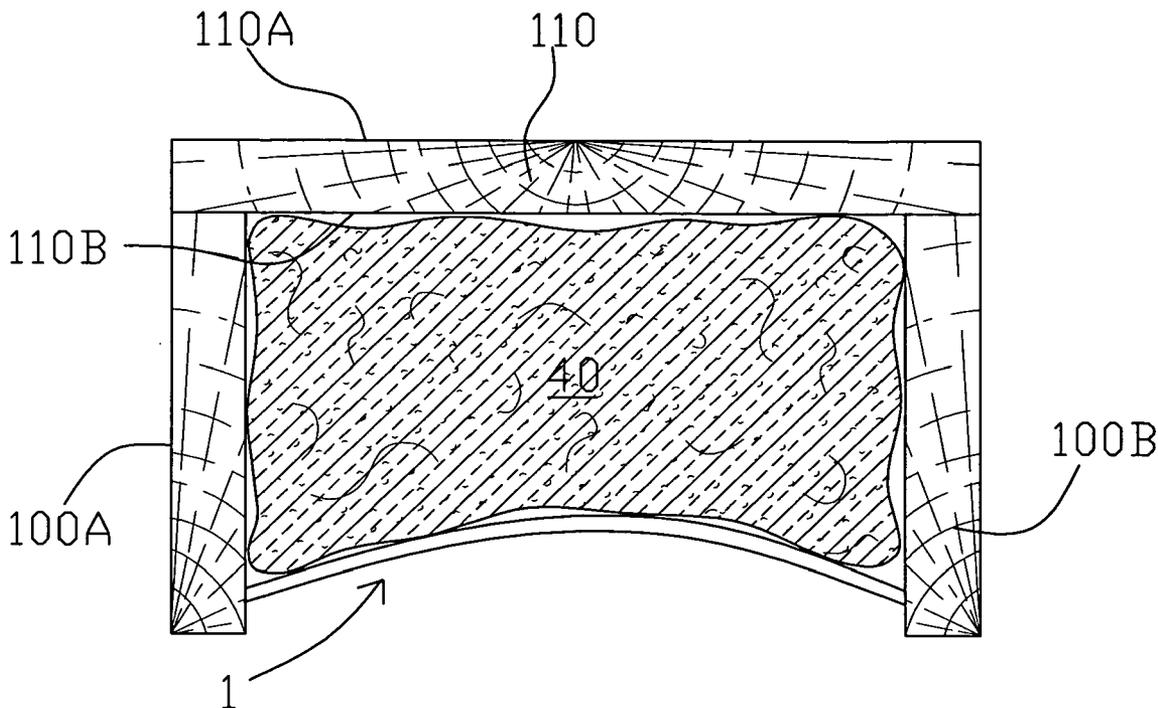
Correspondence Address:
Bradley D. Goldizen
One Columbus Center, Ste. 665
Virginia Beach, VA 23462

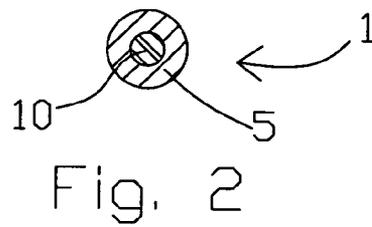
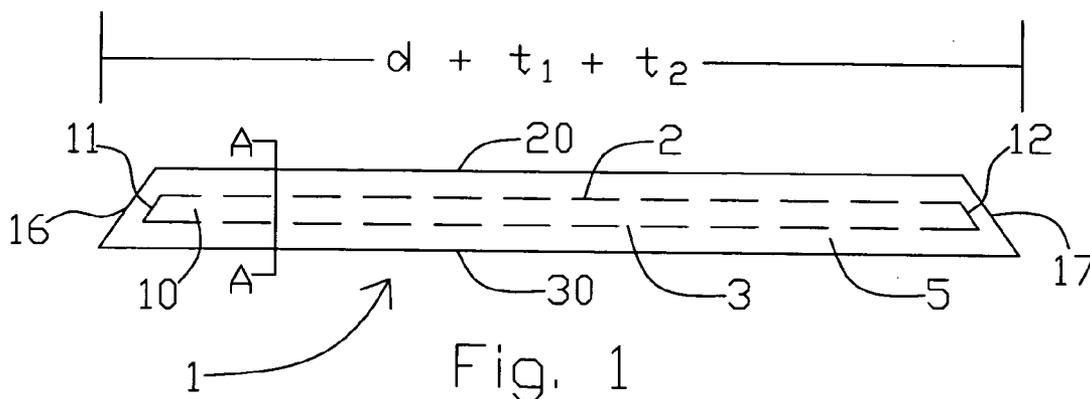
(57) **ABSTRACT**

A wire insulation hanger comprises an inner core of rigid wire and includes an exterior coating of a flexible, environmentally-resistant material. The wire insulation hanger is arranged between two adjacent floor joists to secure insulation there between and includes sloped ends for optimizing a surface area between the wire insulation hanger and each adjacent floor joist.

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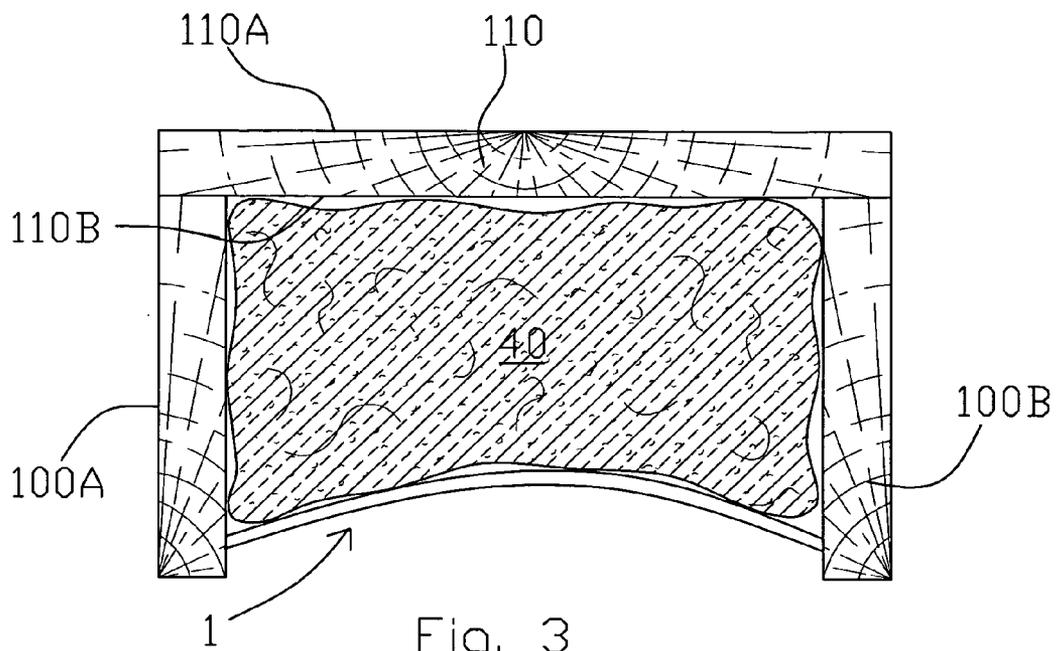


Fig. 3

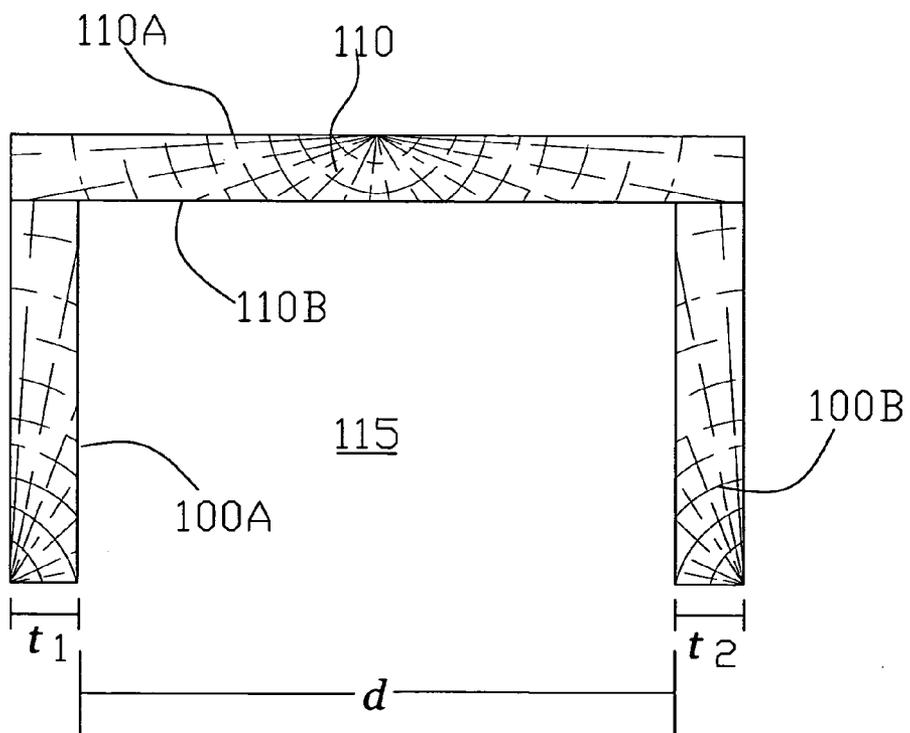


Fig. 5

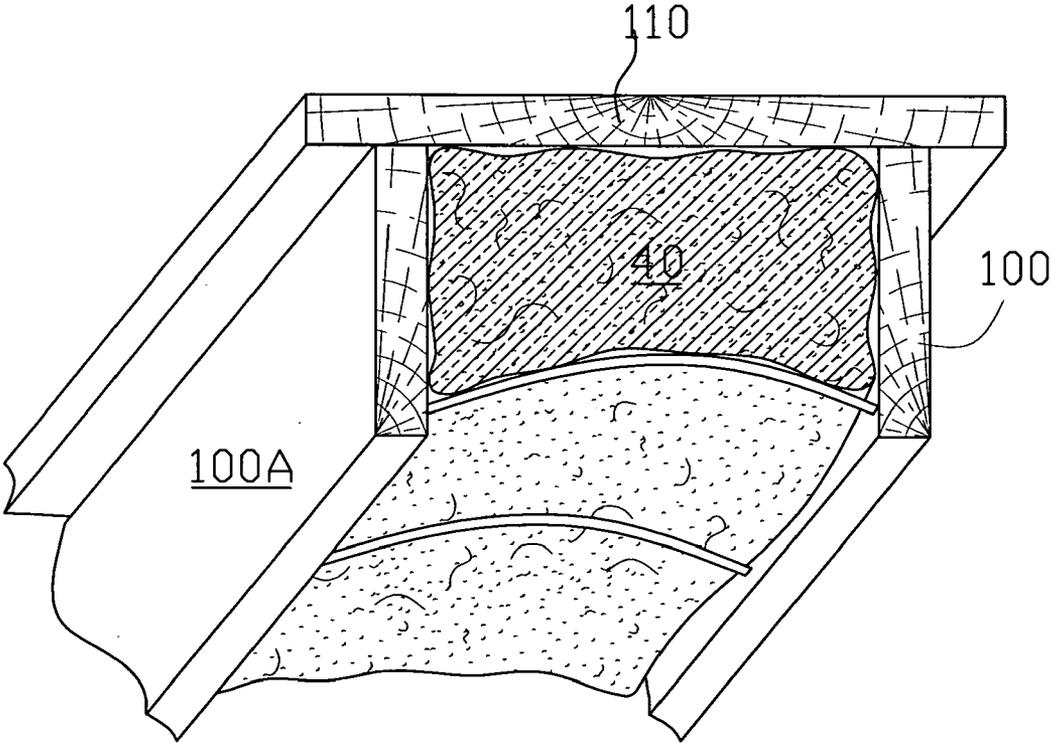
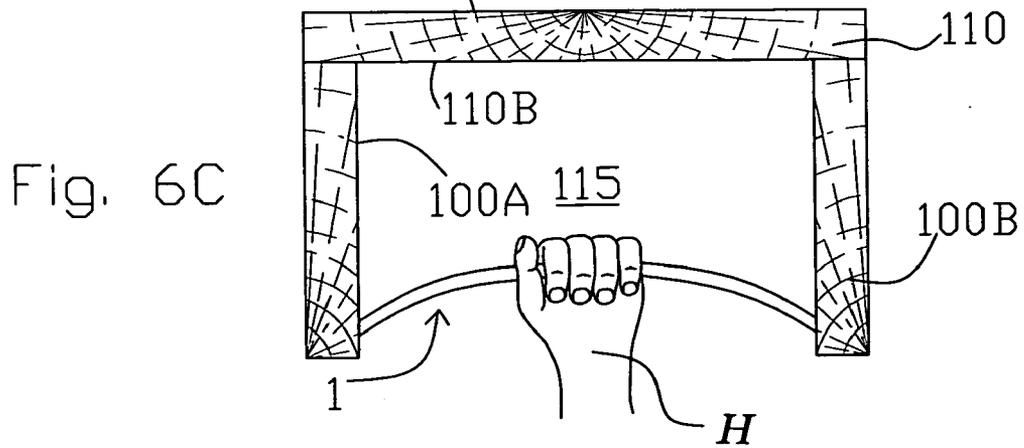
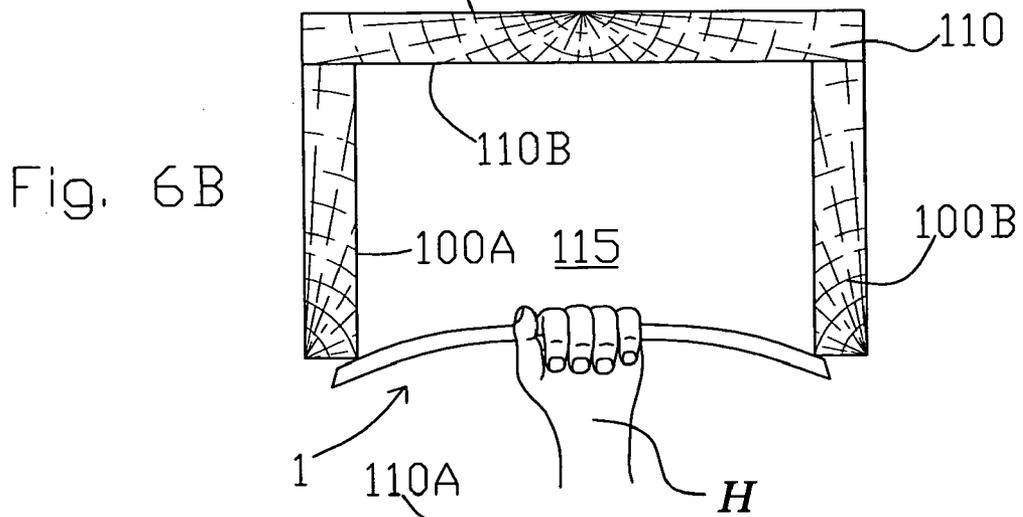
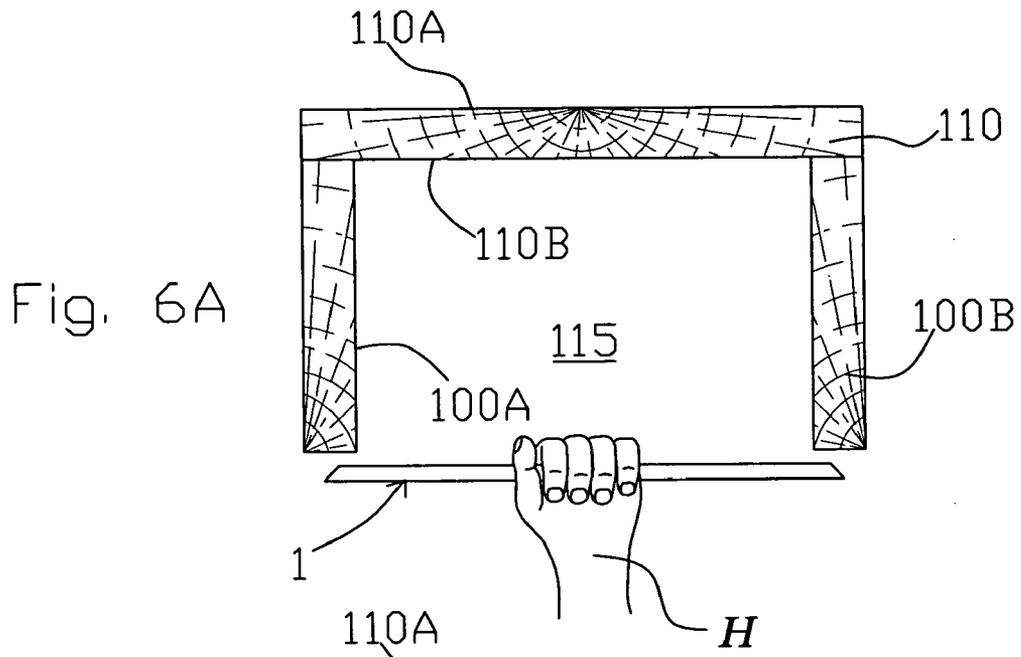


Fig. 4



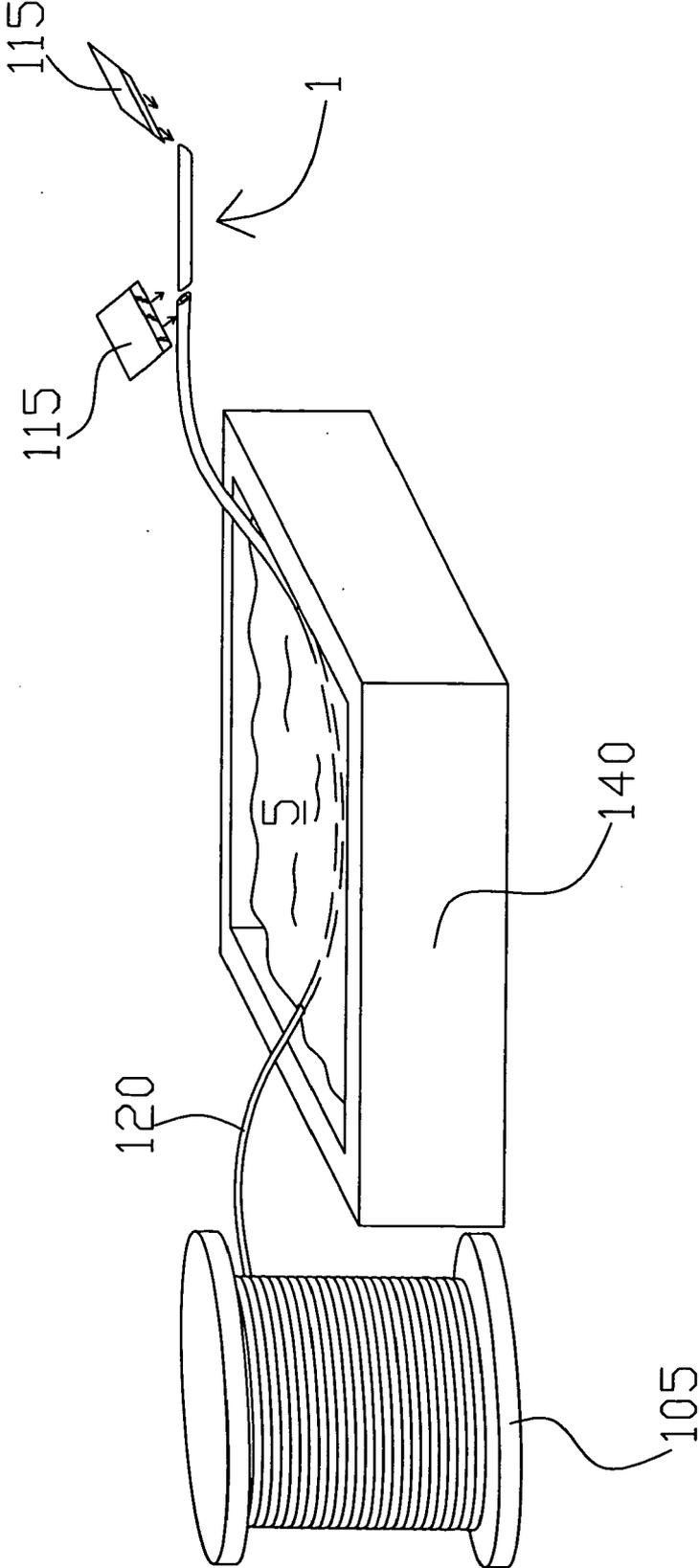


Fig. 7

COATED INSULATION HANGER

[0001] There are no related patent applications.

[0002] The subject matter of the present invention did not receive federal government research and development funding.

BACKGROUND OF THE INVENTION

[0003] The present invention generally relates to an improved wire hanger for securing insulation between structural members. More particularly, the invention relates to a wire hanger that includes a protective outer coating that protects an internal wire hanger to resist detrimental environmental conditions.

[0004] Many modern homes and buildings include insulated floors. Most of these floors are formed from a plurality of floor joists that span from one wall of the building to another one. A sub-floor is arranged and fastened to an upper edge of the floor joists to create a space that is enclosed on three sides. Bats of insulation are installed and secured in this space in a variety of manners.

[0005] Representative patents that have been directed towards securing bats of insulation include J. R. Parsons, U.S. Pat. No. 2,278,732 which discloses an insulating building structure that comprises a fibrous insulating bat that is substantially self-supporting and includes a resilient means that supports the bat when it is inserted between supports such as studding.

[0006] H. M. Day et al., U.S. Pat. No. 2,565,206 discloses an insulated building structure that includes a retaining element. A plurality of the retaining elements holds an insulation bat in place between structural members. FIGS. 4 and 5 depict the retaining elements.

[0007] D. J. Bennett, U.S. Pat. No. 3,231,944 discloses an insulation support for securing bats of insulation in place. FIGS. 1 and 5-8 of Bennett show the various embodiments of the insulation support. In Bennett, FIGS. 2-4 show other views of the insulation support, shown in FIG. 1, in use.

[0008] Fortin, U.S. Pat. No. 4,023,323 discloses a construction element for use in securing insulation bats or boards between framing or studding members. The element is generally U-shaped and includes an elongated central body section of a length that is received between two adjacent stud members without deformation. Ends of the body section are angled and provide lateral arms of a length less than the depth of the stud members.

[0009] O'Brien, U.S. Pat. No. 4,437,282 discloses an insulation support hanger for maintaining insulation material in a space between adjacent joints, particularly floor joists. The device includes a mounting member adapted to span the space between adjacent floor joists. Retainer members support the insulation material in a desired position.

[0010] Harkins, U.S. Pat. No. 4,446,664 discloses an insulation system for insulating a ceiling includes a plurality of spaced parallel support bands suspended between opposite walls of a building in vertically spaced relation from the ceiling. A continuous sheet of vapor barrier is supported on the bands. Support band fasteners are spaced apart to support the bands. Insulation material is supported atop the vapor barrier.

[0011] Byler, U.S. Pat. No. 4,799,347 discloses an insulation support truss formed from a thin strip of spring steel that includes a width. A V-shaped or trapezoidal notch is cut at

each end of the strip and forms two pointed tips. In use, the support truss is snapped in place between two floor joists.

[0012] Still others have used various arrangements of wire to support the insulation between adjacent floor joists. However, many of the devices in use deteriorate over time because of certain adverse environmental conditions such as moisture, acids, bases, or other environmental conditions that may have a deteriorative effect on the insulation supports. Thus, these supports must be periodically replaced as they deteriorate and give way to allow the bats of insulation to fall from between the floor joists.

[0013] Installing insulation beneath a sub-floor of a building that is built on a crawl space requires the installer to crawl into a tight space that limits the installer's mobility. Thus the installation process is a dirty, difficult and somewhat dangerous job and it can be recognized that there is a continuing need for and interest in providing improved insulation hanging devices that are easy to install and having extended lives to prevent the need for the insulation to be reinstalled.

[0014] The present invention is a new and improved insulation support that does not suffer from deteriorative environmental conditions because it includes a protective outer coating of cost effective material such as plastic. The insulation support may be easily produced by passing a steel wire core through molten plastic and thereafter cutting the resultant combination while the plastic remains in a liquid state to allow it to flow across the severed ends.

SUMMARY OF THE INVENTION

[0015] The invention is a wire insulation hanger that secures a section or area of a bat of insulation between two adjacent floor joists. The wire insulation hanger includes a core element comprising a rigid metal wire that deteriorates when exposed to environmental conditions such as moisture. This core element is coated with an environmentally resistant exterior coating that prevents deterioration of the core element when exposed to certain unfavorable conditions.

[0016] Each end of the wire insulation hanger is formed with a slanted edge to assure maximum contact with adjacent floor joists when the insulation hanger is installed. The wire insulation hanger is provided in a variety of lengths from approximately 14 inches to 26 inches. The preferred length of each hanger is approximately two inches longer than the distance between adjacent floor joists.

[0017] The wire insulation hanger is preferably formed from a coil of steel wire that has been wound onto a reel. The steel wire forms the inner core of the wire insulation hanger. Thereafter, a free end of the wire is pulled through a bath of molten covering such as plastic or rubber. Whilst the covering is still molten, the coated wire is cut to a desired length. Cutting the hanger while the covering is molten allows the molten exterior covering to flow across and seal each cut end such that the entire length of each device is sealed from exterior environmental conditions. A device that cuts each end of the wire insulation hanger is arranged to cut each end of the hanger in a slanted fashion. The slanted ends are important for increasing the surface area of each end of the device when arranged against a floor joist. The drawings are drafted to show cutter elements as being blades. It should be understood that the cutter elements could be blades, lasers, plasma or any other method or means whereby the wire hanger may be cut.

[0018] It is an object of the invention to provide an insulation hanger for use in installing insulation under sub-flooring

members. The insulation hanger presses a back side of the insulation against an underside of a sub-flooring member.

[0019] It is another object of the invention to install an insulation support member that flexes and includes a flexible outer coating to protect the insulation support member by sealing it from an adverse environment.

[0020] The above and further objects, details and advantages of the invention will become apparent from the following detailed description, when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] FIG. 1 is an elevation view of the wire insulation hanger including its external coating. The broken lines denote the internal wire element that provides structural support to the hanger.

[0022] FIG. 2 is a sectional view taken from line A-A of FIG. 1.

[0023] FIG. 3 is an elevation end view showing the wire insulation hanger in use and securing an insulation member to an underside of a sub-flooring member.

[0024] FIG. 4 is a perspective view showing two wire insulation hangers in use in holding an insulation member between two structural support members such as floor joists.

[0025] FIG. 5 is an elevation view of an opening having certain measurements for determining the preferable length of the wire insulation hanger.

[0026] FIGS. 6A-6C depict a method of installing the wire insulation hanger between parallel floor joists.

[0027] FIG. 7 shows a process or method for producing the wire insulation hanger.

DETAILED DESCRIPTION OF THE INVENTION

[0028] FIGS. 1 and 2 show respective views of the wire insulation hanger 1. The hanger 1 comprises an inner core 10, represented by the broken lines in FIG. 1, surrounded by an exterior coating 5. The inner core 10 is preferably circular in cross section. Ends 11, 12 of the inner core are sloped as shown. Ends 16, 17 of the hanger 1 are also formed in a sloping fashion as shown. This sloping fashion is important for optimizing a surface contact between the adjacent floor joist and the hanger 1. Moreover, it is recognized that the exterior coating 5 assumes the sloped shape of each end 11 and 12, as shown. Each inner core 10 wire insulation hanger comprises a top edge 2 and a bottom edge 3. The top edge 2 is preferably shorter than the bottom edge 3, as shown. Moreover, the exterior coating includes a top edge 20 and a bottom edge 30. Edge 30 is greater in length than edge 20.

[0029] As clearly shown in FIG. 5, a sub-floor 110 includes a top surface 110A and a bottom surface 110B and is arranged and fastened atop adjacent floor joists 100A and 100B. Each floor joist 100A and 100B comprise a thickness, t_1 and t_2 , respectively, and are arranged a distance d apart. As shown in FIG. 1, the preferable total length of the hanger 1 is equal to the sum of the distance d between floor joists 100A and 100B and thicknesses t_1 and t_2 . The sub-floor 110 and floor joists 100A and 100B define an area 115 into which a bat of insulation is secured.

[0030] FIGS. 3 and 4 show respective views of the wire insulation hanger 1 in use. In the preferable method of use, a bat of insulation 40 is pushed into the area 115, as defined by the sub-floor 110 and between the adjacent floor joists 100A and 100B and shown in FIG. 5. The bat of insulation is

supported against the underside of the sub-floor 110B with one hand of the installer. The wire insulation hanger 1 is then grasped by the other hand of the user and inserted between the adjacent floor joists to be properly seated such that the sloped edges 16 and 17 are arranged in contact with the inner surface of the respective floor joist 100. In this embodiment, the wire insulation hanger 1 may be either bowed upwards or bowed downwards. However, it is preferential that the wire insulation hanger 1 be bowed in an upward manner away from the area nearest the ground located under the sub-floor. This upward bowing causes the sloped ends of the wire insulation hanger 16 and 17 near the bottom side 3 to dig into the wood or other material of the sub-floor. The installer then moves along the length of the bat of insulation 40 and installs additional wire insulation hangers 1 every two to three feet to support the insulation between the adjacent floor joists.

[0031] FIGS. 6A-6C show the method of use of the wire insulation hanger 1. The hanger 1 is grasped near its center and oriented with the sloped ends as shown in FIG. 6A in the hand H between the thumb and fingers of the installer, as shown. Next, the wire insulation hanger 1 is forced between the two floor joists as shown in FIGS. 6B and 6C such that the sloped ends of the hanger exert an outward pressure against adjacent floor joists to secure the insulation between them. This outward pressure causes the sloped ends 16, 17 of the support member 1 to dig into floor joists 100A and 100B. If an insulation bat is inserted between the floor joists, as shown in FIG. 4, the wire insulation hanger 1 will retain it in place, as shown.

[0032] FIG. 7 depicts a schematic view representing a process for manufacturing the wire insulation hanger 1. In the preferred process, the core 10 of the wire insulation hanger is formed from a length of steel wire 120 that is wound onto a reel 105. The reel 105 may be hung and the length of steel wire 120 may be played off the reel 105 by stripping it from the reel 105. A free end of the steel wire 120 is pulled, or pushed, through a molten or liquefied bath 140 of coating material 5 that seals the entire length of the core. The wire 120 is cut on a sloped angle, as shown in FIG. 1, at predetermined lengths upon removal of it from the molten bath 140. The cutting of the wire may occur in a variety of manners, such as mechanical devices including blades, electrical cutting devices, laser cutting devices, plasma cutters or any other cutting means.

[0033] It is to be understood that the invention is not limited to the exact construction illustrated and described above. Various changes and modifications may be made without departing from the spirit and the scope of the invention as defined in the following claims.

I claim:

1. An insulation hanger that secures a section of insulation batting between two parallel joists, said insulation hanger comprising:

- a wire element having a top surface, a bottom surface and exterior surface that has a length greater than a span between two adjacent floor joists arranged below a sub-floor of a building, said wire element further comprising two sloped ends arranged such that said top surface is shorter in length than the bottom surface; and,
- a moisture resistant coating arranged on the exterior surface of the rigid wire element to prevent the wire element from coming into contact with environmental conditions that exist below the sub-floor.

2. The insulation hanger of claim 1 wherein said wire element is one or more selected from a group consisting of steel, aluminum, and copper.

3. The insulation hanger of claim 1 wherein the wire element is a steel wire.

4. The insulation hanger of claim 1 wherein the length of the wire element equals the sum of a width of a first floor joist added to a width of a second floor joist added to a distance between the first and second floor joists.

5. The insulation hanger of claim 1 wherein said moisture resistant coating comprises rubber.

6. The insulation hanger of claim 1 wherein said moisture resistant coating comprises plastic.

7. An insulation hanger produced by the steps of:

moving an end of a roll of metal wire through a bath of liquid material dries when removed from the bath, said liquid material comprising an environmentally resistant material;

coating an entire exterior surface of the metal wire with the liquid material; and,

cutting the metal wire to a desired length before said liquid material dries, said desired length being equal to the sum of a width of a first floor joist added to a width of a second floor joist added to a distance between the first and second floor joists.

8. A system for securing insulation to an underside of a sub-floor that comprises adjacent floor joists, said system comprising:

a plurality of wire hangers that comprise a core of steel wire and an exterior coating that resists caustic environmental conditions; and,

a bat of insulation which is inserted into a space below the sub-floor that is defined by the adjacent floor joist and secured there by the plurality of wire hangers which extend between the adjacent floor joists below the bat of insulation.

9. The system of claim 8 wherein each wire hanger includes a top side and a bottom side, and two sloping edges that slope from the top side to the bottom side such that said bottom side is greater in length than said top side.

10. The system of claim 8 wherein said wire element is one or more selected from a group consisting of steel, aluminum, and copper.

11. The system of claim 8 wherein each wire hanger comprises a steel wire.

12. The system of claim 8 wherein the exterior coating comprises rubber.

13. The insulation hanger of claim 8 wherein said exterior coating comprises plastic.

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