

[54] **WIRE PROTECTOR FOR MOBILE HOMES AND THE LIKE**

[75] Inventor: **William R. Baillie**, Hoffman Estates, Ill.

[73] Assignee: **Blue Ribbon Industries, Inc.**, Arlington Heights, Ill.

[22] Filed: **Mar. 15, 1973**

[21] Appl. No.: **341,476**

[52] U.S. Cl. **174/48, 16/2, 138/156**

[51] Int. Cl. **H02g 3/04**

[58] Field of Search **138/156, 169, 161; 174/48, 174/152 G, 154 R, 135; 16/3, 108, 2**

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Primary Examiner—Richard C. Queisser

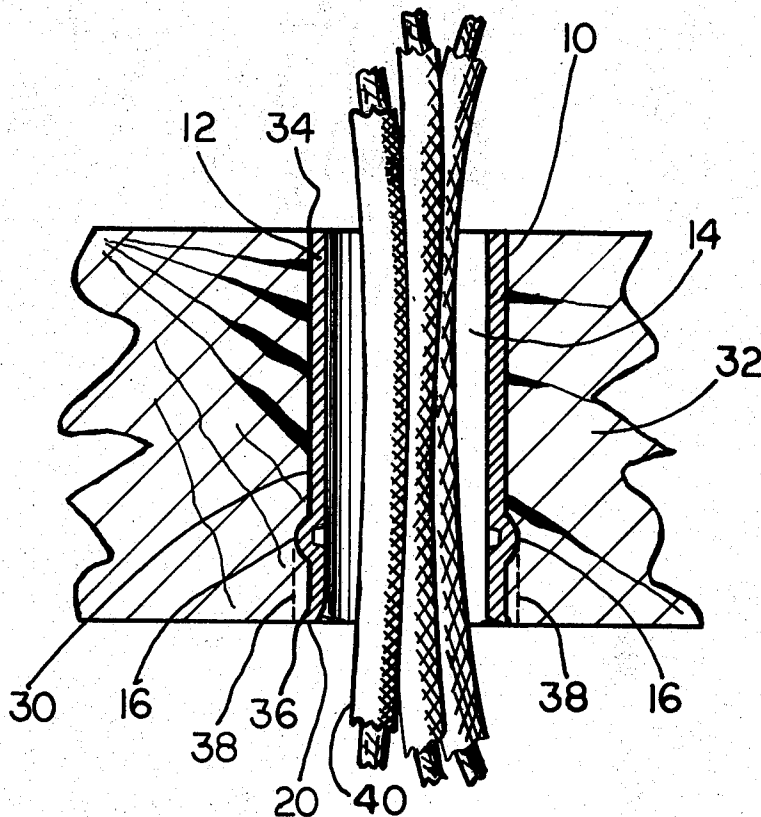
Assistant Examiner—Daniel M. Yasich

Attorney, Agent, or Firm—Silverman & Case, Ltd.

[57] **ABSTRACT**

A wire protector comprising a steel tube rolled from a flat sheet that has had a plurality of dimples formed adjacent one edge which will become an axial end of the tube. The tube is cylindrical and of an external diameter closely to fit a hole bored in a stud of a mobile home or recreational vehicle. The dimples protrude from the exterior and when the wire protector is hammered into the hole of the stud, the dimples grip the stud and additionally cause slight contraction of the tube forcing the seam tightly closed.

4 Claims, 5 Drawing Figures



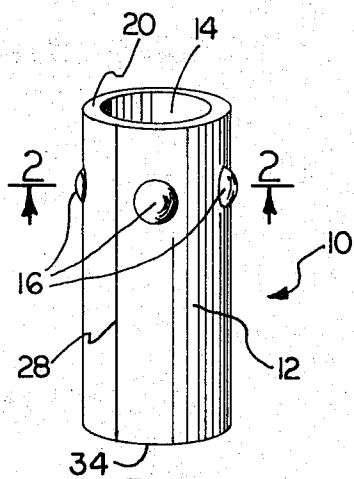


FIG. 1

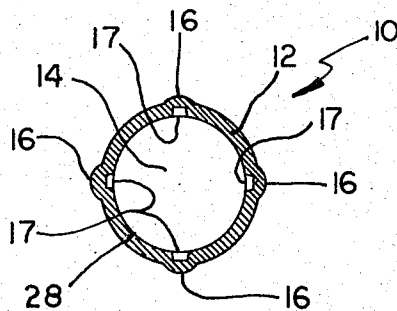


FIG. 2

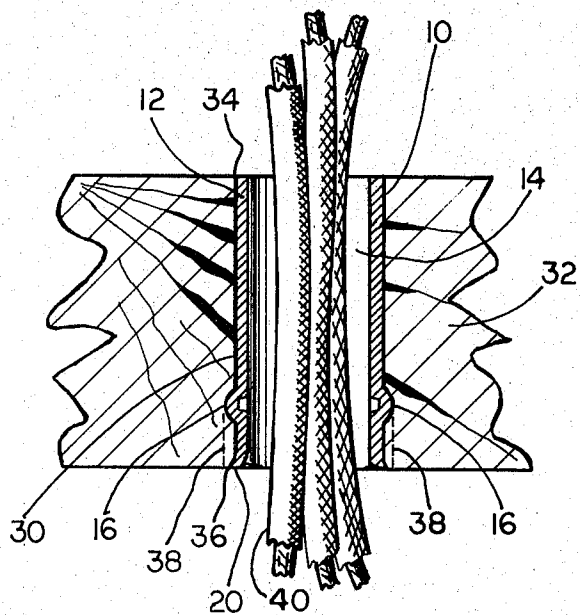


FIG. 3

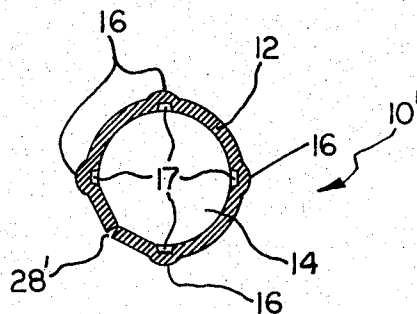


FIG. 4

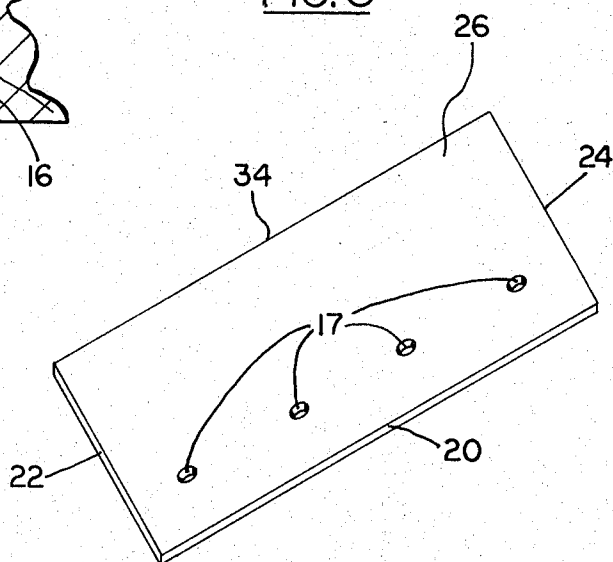


FIG. 5

WIRE PROTECTOR FOR MOBILE HOMES AND THE LIKE

BACKGROUND OF THE INVENTION

The invention relates to wire protectors used in mobile homes and recreational vehicles. The purpose of the wire protector is to form a shield or sheath for wires passing through wooden members such as studs, risers and beams. An important need for wire protectors is to prevent wiring from being pierced by nails, screws or other fasteners used by the occupant. With space at such a premium in vehicles of this type, the chances of some fastener being driven into the wire are increased, especially since supporting structures even of light weight preferably are mounted to studs and the like members.

Wire protectors of this general nature are known. One type consists of a cylindrical tube having its seam welded and provided with a flare at one end thereof. The end opposite to the flare is placed at the entrance of the hole and the protector driven fully into the hole. Although this is an effective wire protector it is very expensive to manufacture.

Another type of wire protector consists of a simple rectangular sheet of steel rolled to provide an open tapering seam. The narrower end of the seam is placed in the drilled hole and the wire protector driven home. The purpose of the tapered seam is to provide leeway for the hole causing the end being hammered to be forced to contract. The theory is that this will tightly hold the wire protector within the hole.

The problem with the latter type of wire protector is not only that there is a tendency for the protector to shake loose as the wood dries and the vehicle is subjected to vibration, but additionally, the installer must be careful to face the seam downwardly since it does not tightly close. In any other location the seam could provide a guide for the entrance of a nail or screw which could pierce the wires passing through the protector.

The invention is directed to a highly economical wire protector which does not require orienting when installed and which gives maximum protection against the wires being pierced. The disadvantages of the prior art are obviated as will be explained hereinafter.

SUMMARY OF THE INVENTION

A wire protector comprising a cylindrical tubular member formed of a single rectangular member of sheet steel and having a closed seam. Protruding dimples are provided circumferentially spaced adjacent one axial end of the wire protector and serving to substantially lock the wire protector into a wooden stud or the like. The protector is adapted to be driven into a predrilled hole in the stud.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a wire protector constructed in accordance with the invention;

FIG. 2 is a sectional view taken through the wire protector along the line 2—2 of FIG. 1 and in the indicated direction;

FIG. 3 is a view similar to that of FIG. 2 but showing a modified form of the invention;

FIG. 4 is a sectional view taken through a structural member of a mobile home or the like having the wire

protector of the invention installed therein and wires being shown traversing the wire protector; and

FIG. 5 is a developed view of a steel blank suitable for forming the wire protector of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Generally, as previously explained, the invention relates to a wire protector for mobile homes and recreational vehicles. Specifically, the wire protector serves as a shield or sheath passing through a structural member so that wires may be pulled through the member and be protected.

The wire protector of the invention is designated generally by the reference character 10 and the same comprises an elongate steel cylindrical tube 12 formed of sheeting suitably rolled or otherwise operated upon. The bore 14 of the wire protector 10 provides a passageway 14 to enable wires to be pulled through the same as will be explained in connection with FIG. 4. A plurality of dimples or protrusions 16 is formed in the tube 12 in any suitable manner, such as, for example, by upsetting the material in punching shallow recesses 17 into the interior of the wall 12. These protrusions 16 are preferably spaced circumferentially around the periphery of the tube 12 and are located adjacent one axial end 20. For example, the distance from the center of the protrusions 16 and the end 20 in a commercial version was three-eighths of an inch.

When the body 12 is formed either in a rolling process or in suitable dies or fixtures using punch press techniques, the resulting abutting ends 22 and 24 (see FIG. 5) of the blank 26 from which the wire protector 10 is formed will tightly engage to provide an axially extending seam 28. In the fabrication, this seam is closed as shown in FIGS. 2 and 3. Since techniques may vary, the abutting ends 22 and 24 may not in certain instances be perfectly arcuate as shown in the wire protector 10' of FIG. 3. This is a variation of the structure of the invention that does not adversely affect its efficiency and operation. The resulting seam is shown at 28'.

In use, a hole 30 having the same diameter as the wire protector 10 or 10' is drilled in a wooden structural member such as shown at 32 in FIG. 4. For example, the hole 30 is drilled three-quarters of an inch in diameter and the wire protector 10 or 10' has an outer diameter of three-quarters of an inch. The axial end 34 opposite the end 20 is inserted into the hole and the end 20 is struck with a hammer, driving the wire protector 10 or 10' fully into the hole. The wire protector is preferably the same length as the width of the structural member. For example, in ceilings where 1 × 4's or 1 × 6's are used as stringers, the finished lumber thickness is three-quarters of an inch. The length of a wire protector for this type of installation would be approximately three-quarters of an inch. Thus, wire protectors one and five-eighths inch long would be suitable to pass through 2 × 4's and wire protectors approximately three and one-half inches long would be suitable where a stud is formed of a double thickness of 2 × 4's.

When the wire protector has been driven into the hole, if the end 20 is slightly peened as shown at 36 in FIG. 4, it does not adversely affect the installation. When the dimples or protrusions 16 engage the walls of the hole 30 two things occur. In the first place they exert a constricting pressure on the wire protector 10

tending to more tightly close the seam 28, thereby giving additional protection against entry by a nail or screw. The second thing that occurs is that the wood adjacent the entrance to the hole 30 is compressed slightly as the protrusions 16 enter. The paths of these protrusions are indicated by the dotted lines 38 in FIG. 4. Since wood generally is of a quasi-plastic nature, the grooves formed by the protrusions will tend to regain their original configuration thereby closing. The protrusions 16 are deliberately formed to be rounded so as not to tear the fibers of the structural member 32. After a period of time when the wood has recovered, the wire protector 10 or 10' will substantially be locked in place so that vibration will not be able to dislodge the same.

In FIG. 4 several wires are shown at 40 passing through the passageway 14.

In the manufacture of the wire protector 10 or 10', the same is rolled from a blank 26 which, as shown, is a rectangular piece of sheet steel. The long edges 20 and 34 will provide the leading and trailing ends respectively of the wire protector when the blank 26 is rolled into the tube 12. The ends 22 and 24 will be abutting as explained. Prior to the rolling process, the recesses 17 are punched or upset on the inside of the blank 26 thereby forming the protrusions 16. As shown, there are four such protrusions 16 on the versions 10 and 10' of the invention but more or less of such protrusions may be used.

In the commercial version of the wire protector, a common grade of cold-rolled sheet steel one-sixteenth of an inch in thickness was used, the resulting structure meeting all of the requirements of mobile home and recreational vehicle codes established by regulatory agencies having jurisdiction over the construction of such mobile homes and recreational vehicles.

In the fabrication of the cylindrical body 12 the individual wire protectors may be formed from individual blanks like rectangular sheet steel blank 26 or in a progressive die arrangement from a strip in which the blanks are cut from the strip before or during the rolling operation. In either event, prior to forming the tubular body 12 the recesses 17 are punched so that the tools, dies, or fixtures which are used must accommodate the protrusions 16 if such protrusions are engaged during the rolling process.

Some variations in the details of the structure of the invention are capable of being made without departing

from the spirit or scope of the invention as defined in the appended claims. For example, while it is preferred that the protrusion 16 be located adjacent one axial end of the body 12, they could be elsewhere and likewise there could be more than one row of the same.

What it is desired to secure by Letters Patent in the United States is:

1. An electrical wire protecting installation in a mobile home or the like including:

A. a wooden structural member forming a support for a partition or the like and through which electrically conductive wires are adapted to be passed,

B. a cylindrical passageway in the structural member passing fully through the same, the walls defining said passageway consisting of the raw wood of said structural member and

C. a metal wire protector tightly wedged in said passageway and comprising:

i. a hollow right cylindrical tubular body member formed of rolled sheet steel and

ii. having a closed axially extending seam formed at abutting ends of the sheet member from which the body is formed,

iii. the outer diameter of the body member being the same as the inner diameter of the passageway and the axial length of the body member being substantially the same as the axial length of the passageway,

iv. the axial ends of the body member being open,

v. and there being a plurality of circumferentially spaced generally spherical upset protrusions formed on the exterior of the body member,

the wire protector adapted to be installed by driving the same into the passageway so that the protrusions dig into the wooden walls defining the passageway to wedge the protector in place without substantial tearing of fibers and provide a protected metal passageway for electric wires through the structural member.

2. The combination as claimed in claim 1 in which said seam is formed by arcuate abutting edges.

3. A combination as claimed in claim 1 in which said seam is formed by relatively planar edges.

4. The combination as claimed in claim 1 in which said protrusions are spaced from one axial end and closer to that end than the other.

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