United States Patent [19]

Logsdon

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[54] **PIPE PROTECTOR**

[76] Inventor: **Duane D. Logsdon,** 1719 Canyon Rd., Fullerton, Calif. 92631

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[52] **U.S. Cl.** ..... **138/96 R,** 138/89, 220/42 A

[51] **Int. Cl.** **B65d 59/06**

[58] **Field of Search** ..... 138/96 R, 96 T, 89; 285/3; 220/24 A, 42 A, 27, 60, 94 A

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Primary Examiner—Richard C. Queisser
Assistant Examiner—Daniel M. Yasich
Attorney, Agent, or Firm—Edward D. O'Brian

[57] **ABSTRACT**

A pipe protector for use in protecting a pipe having an end as concrete is located adjacent to the pipe end and in providing a cavity within the concrete extending around the pipe adjacent to the pipe end preferably is constructed as a single unit out of a polyolefin polymer such as polyethylene which is substantially incapable of bonding to concrete as the concrete sets. Such a protector includes a top having a handle adapted to be used for removing the protector after concrete has been cast around it, a dependent skirt attached to the top which is capable of fitting around the pipe adjacent to the pipe end and at least three spacing fins attached to the skirt so as to extend radially inwardly from the skirt. The fins are capable of engaging the exterior of the pipe so as to stablize the protector and are sufficiently flexible so as to absorb at least some forces applied to the exterior of the skirt so as to tend to cushion the pipe against damage.

2 Claims, 3 Drawing Figures

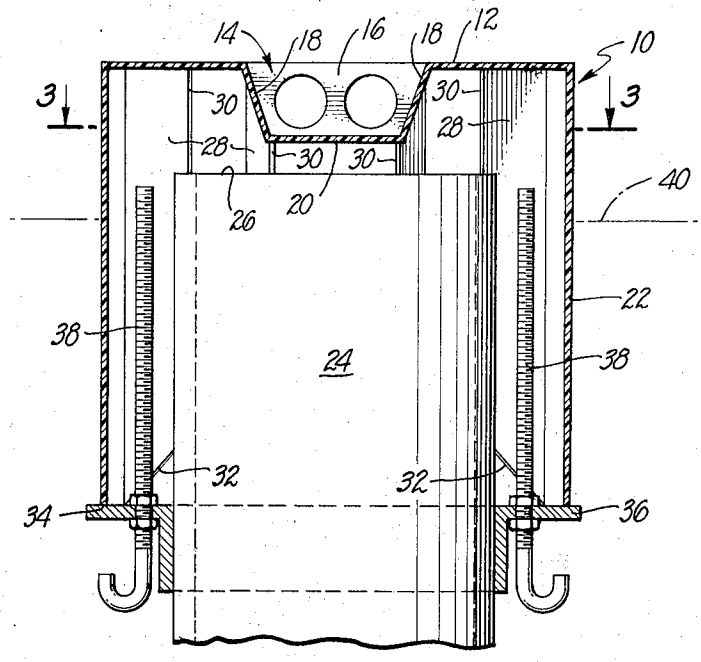


FIG. 1.

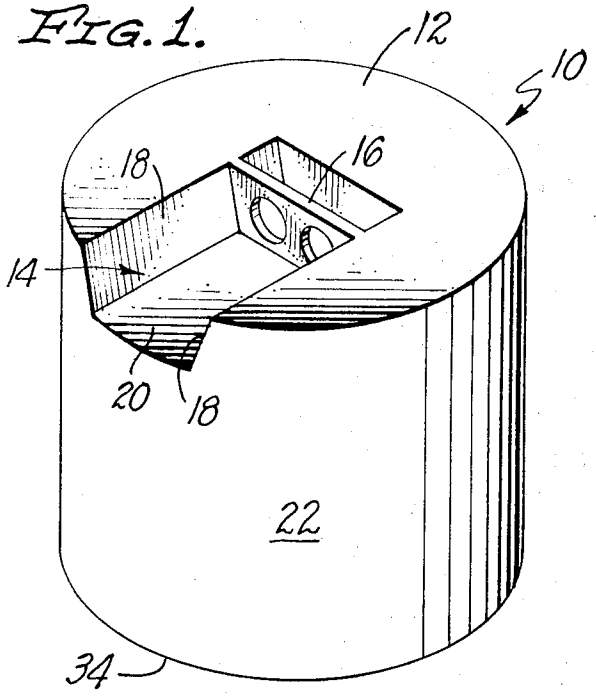


FIG. 3.

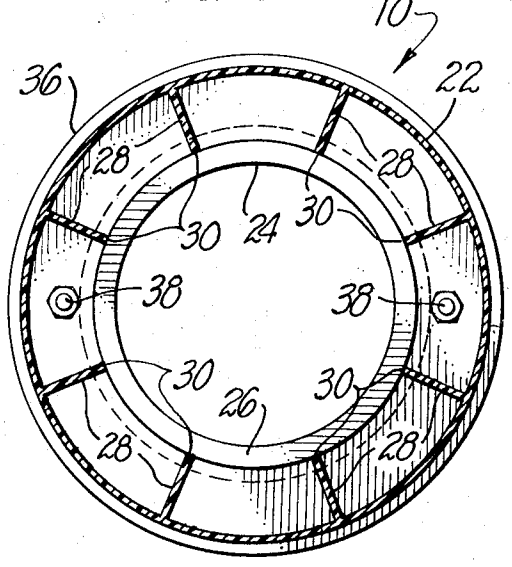
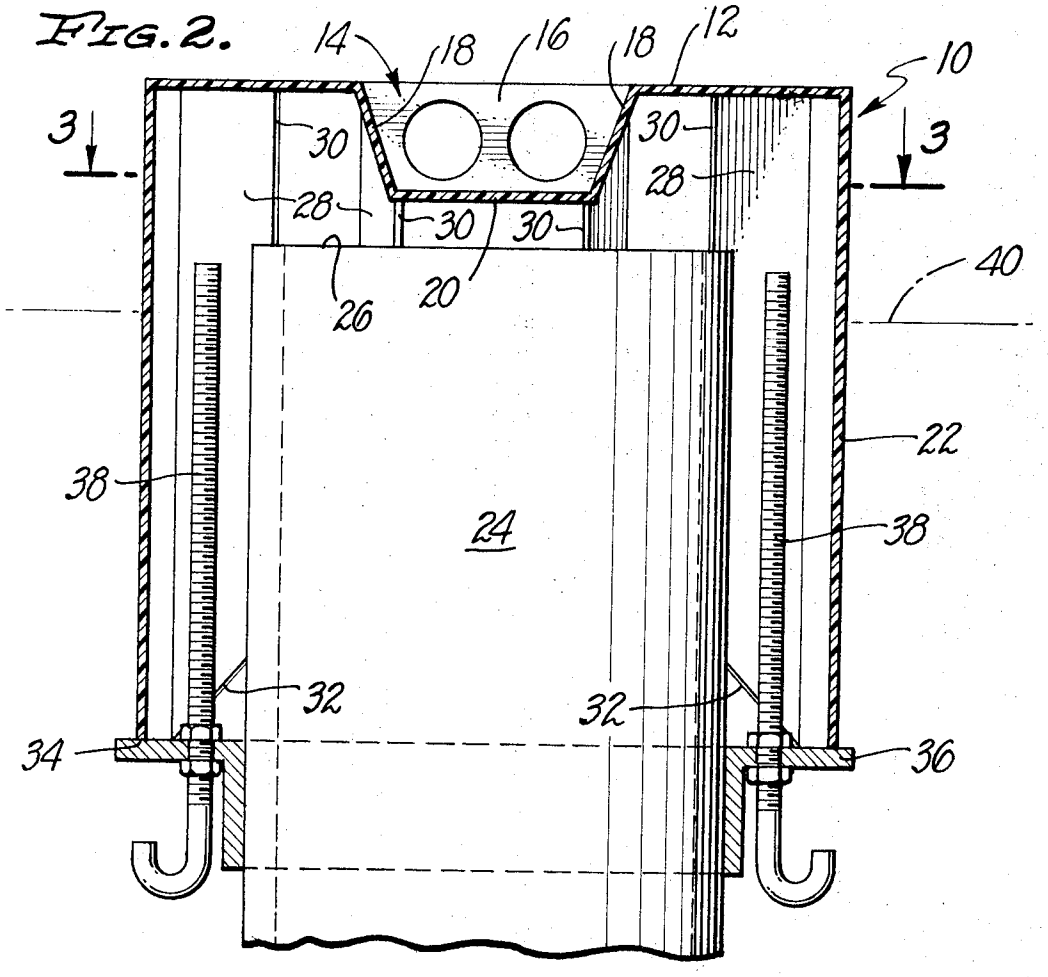


FIG. 2.



PIPE PROTECTOR

BACKGROUND OF THE INVENTION

Frequently it is necessary to locate a pipe so that it extends through a body of concrete, such as a concrete slab, and so that such a pipe has an end located adjacent to the surface of the concrete. In many applications where a pipe is to be located in this manner it is necessary to have a cavity located around the pipe adjacent to the pipe end so as to facilitate the installation of plumbing fixtures and the like. This can be illustrated by referring to the installation of closet bend and shower traps in concrete slabs.

It is normally desired that the pipes constituting such structures be imbeded within the concrete in a floor slab so as to stabilize these pipes and so as to preclude the entrance of vermon into a building. Such pipe structures have ends which must be located adjacent to the surface of such a slab. Further, these ends must be protected against damage as concrete is poured near them so that appropriate plumbing fixtures such as water closets or a drain fixture may be secured to them. It is also normally necessary for these ends to be spaced from the concrete utilized so that such fixtures can be easily connected to them.

In the past, a wide variety of expedients have been used to accomplish this protection and this spacing. Probably the most common of these expedients has involved the use of cardboard wrappings. Such wrappings have been used by being located in place around a pipe end prior to a concrete body being cast in place in contact with them. After such a concrete body, such as the slab, has set to a hard unitary structure such wrappings have been normally pulled out of the concrete.

This type of procedure is considered to be unnecessarily time-consuming and expensive. This is a matter of some criticality because of the comparatively high costs of labor. In addition, however, wrapping procedures as are indicated in the preceding paragraph tend to be somewhat disadvantageous or undesirable because frequently the concrete will tend to bond to the wrappings. With prior wrapping techniques there has normally been at least some difficulty in removing the wrappings used without damaging the concrete surfaces adjacent to these wrappings.

BRIEF SUMMARY OF THE INVENTION

It is believed that it will be apparent from the preceding that there is a need for new and improved pipe protectors for use in locating pipes such as closet bends, shower traps and the like in concrete bodies. A broad objective of the present invention is to fulfill this need. More specifically, the invention is intended to provide pipe protectors for protecting pipes having ends as such pipes are located within a concrete body which are comparatively inexpensive, which are easily installed on such pipes, which adequately protect such pipes and their ends as concrete is cast around them, which may be easily and conveniently removed and which can be reused after they have been employed in a particular application.

In accordance with this invention these and various related objectives of the invention are achieved by providing pipe protectors having a top adapted to be located opposite a pipe end, a dependent imporous skirt attached to the top so as to extend downwardly from it around the pipe having the end, at least three spacing fins attached to the interior of the skirt and extending radially inwardly from said skirt so as to engage the exterior of the pipe so as to hold the protector in position and a handle means attached to the top for use in removing the protector after the concrete has been cast in place around the protector and the pipe.

BRIEF DESCRIPTION OF THE DRAWING

Because of space limitations a summary such as the preceding summary is inherently incapable of indicating all of the features and facets of an invention such as the present invention. Further details with respect to this invention will be apparent from a careful consideration of the remainder of this specification, the appended claims and the accompanying drawing in which:

FIG. **1** is an isometric view of a presently preferred embodiment or form of a pipe protector of this invention;

FIG. **2** is a cross-sectional view of a pipe protector as shown in FIG. **1** illustrating the use of thus protector in connection with a pipe end; and

FIG. **3** is a cross-sectional view taken at line **3—3** of FIG. **2.**

The accompanying drawing is primarily intended to show the nature of a pipe protector in accordance with this invention in such a manner that the features embodied within this pipe protector can be readily explained. The illustrated pipe protector is only a specific embodiment of a structure utilizing the intangible concepts of the invention defined or summarized by the appended claims. These concepts can be utilized within other differently appearing and differently constructed structures through the use or exercise of routine engineering skill.

DETAILED DESCRIPTION

In the drawing there is shown a pipe protector **10** of the present invention which is preferably formed as an integral unit out of an imporous material substantially incapable of bonding to Portland cement type concrete during the setting of such concrete. Because of the availability, cost and ease of fabrication it is preferred to form the protector **10** out of a common polyolefin polymer. It will be recognized that these polymers are extremely inert and are substantially resistent to being adhered to various materials. The protector **10** may be easily formed by injection molding techniques out of various specific polyolefin polymers such as linear polyethylene, isotatic polypropylene or the like.

As formed, this protector **10** includes a top **12** which preferably is of a flat configuration as shown so as to tend to minimize the chances of it being hit during the pouring or finishing of concrete. This top **12** includes a generally notch like recess **14** extending from its periphery across its center. This recess **14** in turn is traversed by a small handle **16** located at the center of the top **12.**

The ends of the handle **16** are carried by and formed integrally with side walls **18** of the recess **14** so as to support the handle **16** as firmly as possible in order to minimize the possibility of the handle **16** being pulled away from the top **12** during removal of the protector **10** after its use. This handle **16** is also preferably formed integrally with the bottom **20** of the recess **14** for the same reason. Within the structure shown the re-

cess **14** is advantageous in that it is substantially horizontal to the exterior of the top **12** so as to facilitate its being cleaned out in the event concrete or other debris should be lodged within it.

The top **12** carries a dependent cylindrical skirt **22** which is larger in diameter than the diameter of a pipe **24** with which the protector **10** is to be used and which is sufficiently long so as to be adapted to fit along the pipe **24** adjacent to an end **26** of it. Within the interior of the skirt **22** there are located at least three fins **28** which extend inwardly from the skirt **22** radially towards the center of this skirt **22.** These fins **28** terminate in edges **30** which are located in the locus of a circle corresponding to the diameter of a pipe **24.**

These edges **30** are formed so as to be capable of frictionally engaging the exterior of the pipe **24** adjacent to the end **26** so as to space the skirt **22** so that the skirt **22** is located concentrically about the pipe **24** and the end **26.** These fins **28** preferably have tapered bottoms **32** which are adapted to facilitate installation of the protector **10** over the end **26** so that the fins **28** engage the pipe **24** to a sufficient extent along its length so that the protector **10** is held against movement by contact between the fins **28** and the pipe **24.**

Preferably these fins **28** are sufficiently thin so as to be capable of a limited amount of flexing when they are installed as shown. This is considered advantageous in that it enables the skirt **22** to act to a degree as a shock absorber. In performing in this manner, the skirt **22** will tend to absorb forces applied to it so as to tend to cushion the pipe **24** against damage. Preferably the number of the fins **28** used is determined with reference to the diameter of the pipe **24** so that these fins **28,** although spaced equally from one another, are sufficiently close together so that there is substantially no chance of a pipe **24** becoming located between them.

During the utilization of the protector **10** it may by located as shown so that the bottom edge **34** of the skirt **22** rests against a flange **36** secured to or positioned around the pipe **24.** It may also be utilized where no such flange is is present by merely being slid down over a pipe end to any desired degree. It will be noted that the flange **36** shown supports attachment bolts **38** which project upwardly in the space within the skirt **22** around the pipe **24.** The portions of these bolts **38** within the space are thus protected with the protector **10** against the accumulation of concrete as the protector **10** is utilized in its intended manner of operation.

During such utilization Portland cement type concrete or a related composition may be cast around the pipe **24** to a level **40** as shown in FIG. **2** of the drawing. After such concrete has been set-up the handle **16** may be engaged so that the protector **10** may be pulled out of the concrete. The material used in the skirt is obviously important in preventing bonding to the concrete. So that the protector **10** can be easily removed it is necessary for the skirt **22** to have a smooth exterior and a bottom edge **34** which is no larger than any upper portion of the skirt above its bottom edge **34.** Preferably the fins **28** used are attached to the top **12** so as to depend from this top **12** so as to transmit forces as the handle **16** is lifted in such a manner as to prevent bowing of the top. Thus, these fins to a degree serve as structual webs.

I claim:

1. A pipe protector for use in keeping concrete away from an end of a pipe as concrete is located around said pipe end and for use as a form in creating a cavity extending around said pipe adjacent to said pipe end, said pipe protector comprising:

an imporous top adapted to be located opposite said pipe end,

a dependent, imporous, cylindrical skirt attached to said top so as to extend downwardly from said top,

the interior of said skirt being completely closed off by said top,

said skirt being larger in diameter than said pipe and being sufficiently long so as to be adapted to fit along said pipe adjacent to said pipe end when said top is located opposite said pipe end,

said skirt having a smooth exterior and a bottom diameter which is no larger than the diameter of the upper portion of said skirt anywhere above said bottom,

at least three spacing fins attached to the interior of said skirt and extending radially inwardly from said skirt, said fins also being attached to said top so as to depend from said top,

said fins being spaced from one another and terminating in aligned edges located in a locus of a circle corresponding to the diameter of said pipe and being capable of engaging said pipe adjacent to said pipe end so as to space said skirt from the periphery of the pipe adjacent to said pipe end,

said fins being sufficiently flexible so as to be capable of absorbing forces applied to the exterior of said skirt so as to cushion said pipe against said forces and being sufficiently rigid to position said protector on said pipe so that said skirt is concentric with said pipe,

recessed handle means in said top for use in removing said pipe protector from around said pipe end after concrete has been cast around said pipe protector,

said top, said skirt, said fins and said handle are integral with one another and are formed of the same material,

said material is a polyolefin polymer composition.

2. A pipe protector as claimed in claim **1** wherein:

said top has a recess located therein which extends to the periphery of said skirt, and

said handle is located within said recess and is attached to said top within said recess.

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