United States Patent

Heroux

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[54] END ROLL PROTECTOR

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[52] **U.S. Cl.** .....**206/59 F,** 206/58, 242/118.61

[51] **Int. Cl.** **B65d 85/67**

[58] **Field of Search** .....206/59 F, 59 R, 58, 52, 65 Y, 206/46 Y; 242/118.61, 118.8, 68.5, 68.6

[56] **References Cited**

UNITED STATES PATENTS

3,584,819	6/1971	Brough	242/118.61
2,708,031	5/1955	Martineau	206/59 F
1,954,848	4/1934	Scott	206/59 F
3,260,362	7/1966	Schwinne	206/58
3,399,761	9/1968	Hayashi	206/654

FOREIGN PATENTS OR APPLICATIONS

844,633	5/1952	Germany	242/118.61

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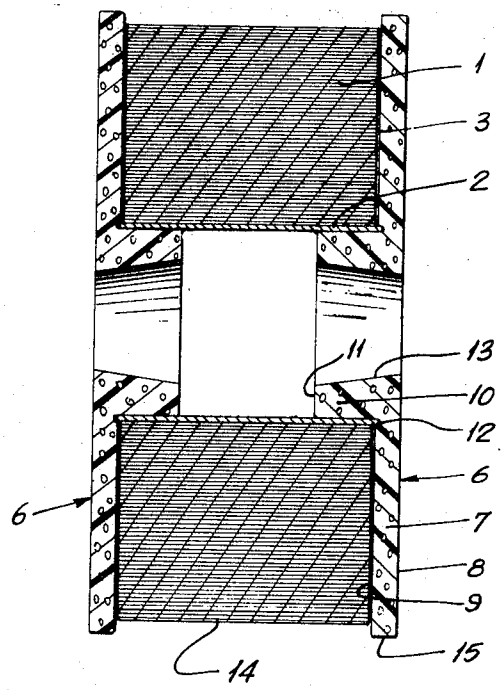
[57] **ABSTRACT**

This invention relates to protectors for the ends of rolls of flexible sheet or strip. These protectors consist of discs having a central coaxial extension adapted to be frictionally retained in the hollow core of the roll. They serve to protect the sheet or strip against damage and reduce the wrapping required for the roll.

2 Claims, 3 Drawing Figures



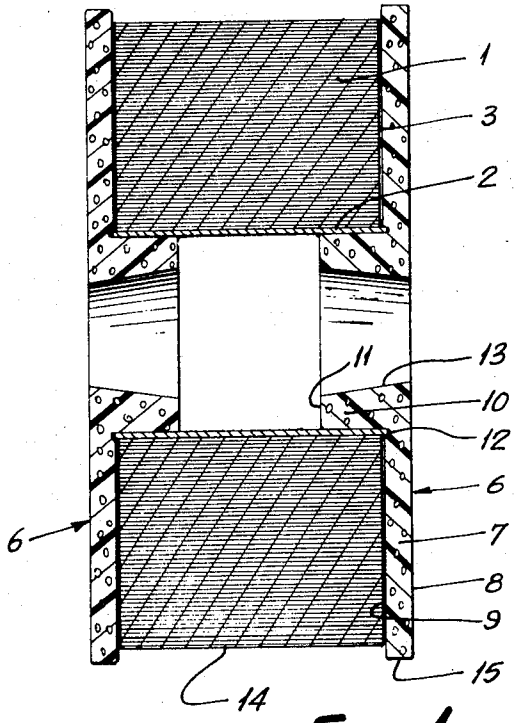


Fig. 1

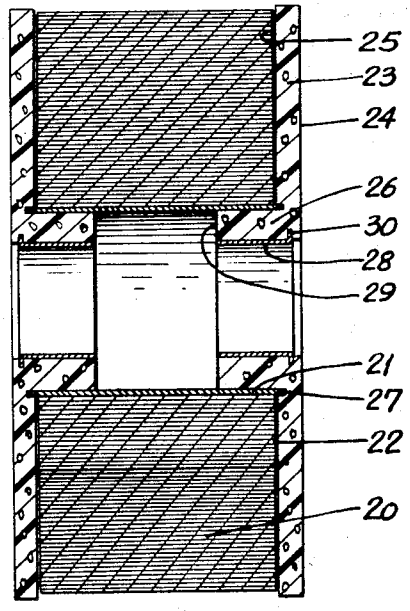


Fig. 3

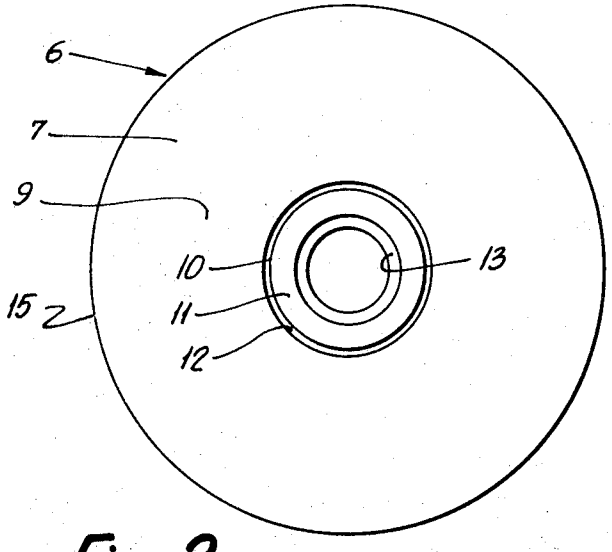


Fig. 2

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END ROLL PROTECTOR

The present invention relates to rolls of wound flexible sheet or strip and, more particularly, to protectors for the ends of such rolls.

It is known that rolls of sheet material often become damaged during transport and handling. Damage may be done to the inner tube or core on which the sheet material is wound, as well as to the sheet material itself.

To prevent damage to the roll during transport and handling, the core is usually fitted with end plugs and the roll is completely wrapped in heavy Kraft paper, which requires a time-consuming and expensive operation and yet the Kraft paper itself is often torn away and the roll of sheet material is often damaged at the end faces of the roll.

Accordingly, the principal object of the present invention resides in the provision of protectors for the ends of the rolls which completely cover the flat end faces of the roll of sheet material to prevent damage to the latter and which also replace the end plugs for the inner tube on which said roll is wound, whereby said protectors serve also as means to protect the inner tube and prevent its collapse.

Another object of the present invention resides in the provision of end roll protectors of the character described, which are of very light weight construction and, therefore, do not add to the overall weight of the roll to any substantial extent, and which are shock-absorbent, sufficiently rigid and solid so as to completely protect the rolls in a fall or against impact.

Another object of the present invention resides in the provision of end protectors of the character described, which are easily placed in position, which will remain in position by frictional engagement with the inner core, which can be easily removed whenever required and which allows to stand on end and stack up rolls fitter with such protectors.

Another object of the invention resides in the provision of protectors of the character described, which allow the inner tube to protrude from the end faces of the roll and yet are in direct face-to-face contact with said end faces.

The foregoing and other objects of the present invention will become more apparent during the following disclosure and by referring to the drawings, in which:

FIG. 1 is a cross-section of the assembly of a roll of wound sheet material and of end protectors in accordance with the present invention at both ends of the roll;

FIG. 2 is an elevation looking at the inner face of one of the end protectors in accordance with the invention; and

FIG. 3 is a cross-section of the assembly of a roll and of modified end protectors.

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, reference numeral 1 indicates several layers of flexible sheet material wound in spiral on an inner tube or core 2 to form a roll of material.

The sheet material may be of any type, such as paper, metal foil, such as aluminum foil, or any film, of synthetic resin, and which has to be protected against damage during transport or handling.

Normally, the tube 2, which may be made of cardboard, plastic or the like, slightly protrudes from the

end flat faces 3 of the roll of sheet material 1, as shown in FIG. 1.

The protectors in accordance with the invention are generally shown at 6 and each essentially consists of a disc 7 having a flat outer face 8 and a flat inner face 9 and provided with an integral hollow plug or extension 10 protruding from the inner face 9 of disc 7 and coaxial with said disc 7.

The outer face of the plug 10 is generally cylindrical, but may be slightly radially inwardly tapered towards the free end 11 of said plug 10. The external diameter of the plug 10 is calculated for the plug to frictionally engage inside the inner tube 2 until the inner face 9 of disc 7 is flat against the end face 3 of the roll of sheet material 1.

In order to accommodate the protruding end of inner tube 2, the inner face 9 of disc 7 is provided with an annular groove 12 immediately adjacent and externally of the outer generally cylindrical face of plug 10.

The plug 10 has a through bore 13, which is preferably radially inwardly tapered from the free end 11 of the plug 10 towards the outer face 8 of the disc 7, so as to more easily unmold the protector.

The discs 7 are calculated so as to have an overall diameter preferably slightly greater than the overall diameter of the roll of sheet material 1, as the latter comes out of the manufacturing plant. Thus, for completing the wrapping of the roll provided with the protectors 6 in accordance with the invention, for transport or shipping of said rolls, it is only necessary to surround the cylindrical outer face 14 of the roll 1 with a strip of corrugated fiberboard, or paper, as wide as the distance separating the inside faces 9 of the two end protectors 6, and this strip of corrugated paper is in turn preferably covered with a strip of Kraft paper, or the like, which may be taped or glued to the outer edges 15 of the protectors 6. Thus, the roll is ready for shipping. When it arrives to the consumer, the latter has only to remove the outside Kraft paper and corrugated fiberboard and also the protectors, if so desired, and to place the roll on an unwinding spindle.

Preferably, the protectors 6 are molded in one piece from synthetic resin, such as expanded polystyrene or polyurethane or the like, of cellular construction, and the polystyrene is preferably of a density of 1½ to 3 pounds per cubit foot. This material is therefore very light so it does not add to the overall weight of the roll and yet is highly resistant to impact and shock and has sufficient rigidity and solidity that it will not break.

The end protectors are simply held in position by frictional engagement with the inner tube 2, which is easily achieved, as expanded polystyrene or the like has a certain amount of resiliency when compressed and since extension or plug 10 protrudes from inner face 9 of disc 7 a distance between one-tenth and one-eighth the diameter of disc 7, as shown in the drawings, thereby providing a large contact area with inner tube 2.

Because the outer faces are flat, the rolls can be stood on end and stacked with faces 8 in contact, to thereby permit shipping of several rolls.

These protectors are found to be very much useful to protect paper, wax paper, aluminum, brass, steel and other metal foil, and also films of synthetic resin or plastic. The manufacturers save money and time in the

wrapping of their roll products, because return of rolls damaged during shipping is eliminated. The consumer saves time and money in the unwrapping of the roll, because he does not have to return damaged rolls.

The end protectors just described have been found to be very useful for rolls of small and medium weight and size. However, for heavier or bigger rolls, it has been found desirable to reinforce these end protectors. In accordance with a modified embodiment, shown in FIG. 3, the cylindrical central extension, which is integral with the disc of the protector, is reinforced by a metal sleeve to prevent collapse of said tubular extension under impact and also to further protect the inside tube of the roll.

Reference numeral **20** indicates several layers of flexible sheet material wound in spiral on an inner tube, or core **21**, to form a roll of material. The sheet material may be of any type, as mentioned in the principal disclosure, and has to be protected against damage during transport or handling.

The tube **21** may be made of cardboard, plastic or the like and slightly protrudes from the end flat faces **22** of the roll of sheet material **20**.

The protector consists of a disc **23**, preferably having a flat outer face **24** and a flat inner face **25**, and is provided with an integral hollow cylindrical extension **26** protruding from the inner face **25** and co-axial with the disc **23**. The external diameter of the hollow extension **26** is calculated to frictionally engage the inside of inner tube **21** until the inner face **25** of the disc **23** is flat against the end face **22** of the roll of sheet material **20**.

In order to accommodate the protruding end of the inner tube **21**, the inner face of disc **23** is provided with an annular groove **27** immediately adjacent and externally of the outer generally cylindrical face of extension **26**.

A cylindrical bushing **28**, made of metal, lines the inside surface of the hollow extension **26** up to its inner end **29**. The outer end of the bushing, or sleeve **28**, is burred or expanded to form a radially outwardly protruding flange **30** embedded in the material of the protector to prevent removal of the sleeve **28**. The sleeve being made of metal will considerably reinforce the hollow extension **26**, especially when used in association with a heavy roll of sheet material. The assembly may be easily mounted on an unwinding spindle with sleeves **28** in contact therewith.

What I claim is:

1. End protectors for a roll of pliable sheet material wound on an inner tube, said roll having substantially flat end faces and said inner tube slightly protruding from said end faces, each said end protector made of a one-piece molded member of expanded cellular synthetic resin consisting of a disc having an inner and an outer face, and of an extension of outer cylindrical shape, protruding from the inner face of said disc and co-axial therewith, said disc and extension having a cylindrical through bore co-axial therewith, said disc having a flat and continuous outer surface, except for the opening defined by said through bore, said inner face of said disc having an annular groove adjacent the external surface of said extension, but being otherwise flat and continuous, said disc having a diameter at least equal to the diameter of said roll, said extension protruding from said disc inner face a distance between one-tenth and one-eighth the diameter of said disc and adapted to frictionally and removably engage said inner tube with the protruding end of said tube fitting said annular groove and with said inner flat face against the end face of said roll, said roll, when fitted with such end protectors, being adapted to be stood on end on a flat horizontal support surface and one on top of the other.

2. End protectors as claimed in claim **1**, wherein said central extension has a free end face and further including a separate rigid metal cylindrical sleeve lining the surface of the through bore of each end protector, one end of the sleeve having a radially outwardly extending flange embedded in the material of the associated protector, while the other end of said sleeve is straight and terminates substantially flush with the free end of said central extension.

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