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[54] **PAPER ROLL SHIPPING PLUG**
 8 Claims, 3 Drawing Figs.

[52] U.S. Cl. **242/68.6**
 [51] Int. Cl. **B65h 75/02**
 [50] Field of Search **242/68.6,**
 68.5, 118.61, 118.7, 68; 206/59 R, 59 F; 220/42 B

[56] **References Cited**

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 Assistant Examiner—Gregory A. Walters
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ABSTRACT: A paper roll shipping plug formed of molded plastic material for insertion in the ends of a central tube in a paper roll and having a disklike central portion and a peripheral rim portion of channel shape in cross section surrounding the disk portion and to whose inner wall the disk portion is connected. The disk portion is positioned in a plane located mediate the ends of the inner wall of the rim and connected to the edge of the inner wall at the open end of the channel by an inner bevelled annular wall portion and an outer annular wall portion disposed in a plane parallel to the plane of the disk portion. The rim portion has inner crosswebs disposed in angular relation to radii of the plug and forming generally triangular cells open at the open end of the channel, and the outer wall of the rim has a bevelled portion at the closed end of the channel forming a taper for insertion into the end of the central tube of a paper roll. Radially extending webs or fins are provided connecting the disk portion with the inner wall of the rim and which taper radially inwardly of the disk portion.

The device thus constructed forms a strong and durable plug which has sufficient resiliency to allow it to be readily driven into the end of the central tube of a paper roll while providing sufficient rigidity to maintain the plug in tight engagement with the inner surface of the tube.

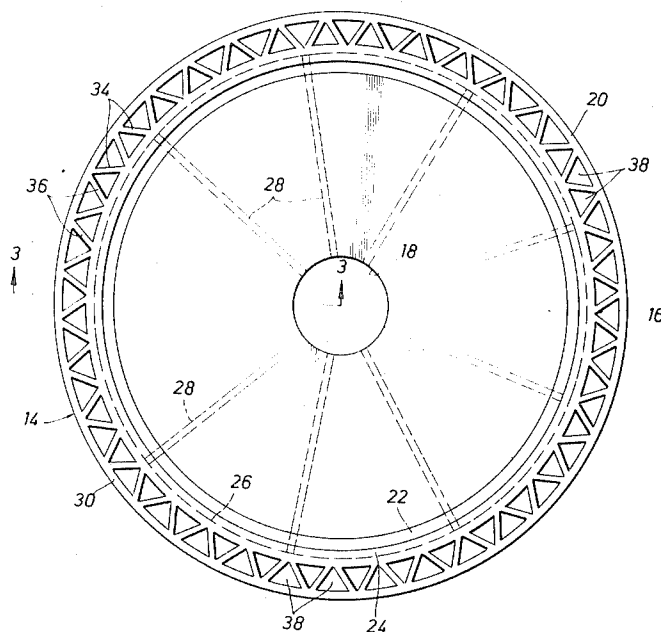


FIG. 1

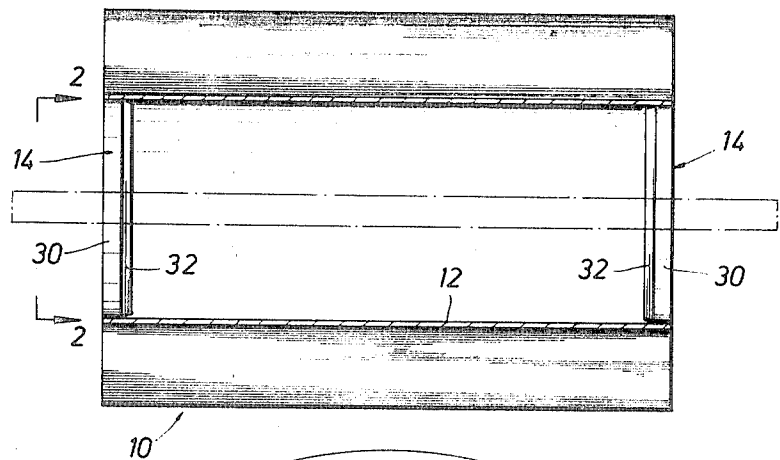


FIG. 2

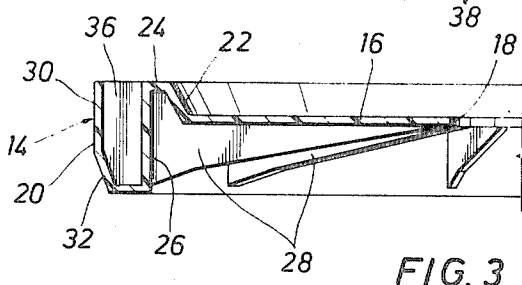
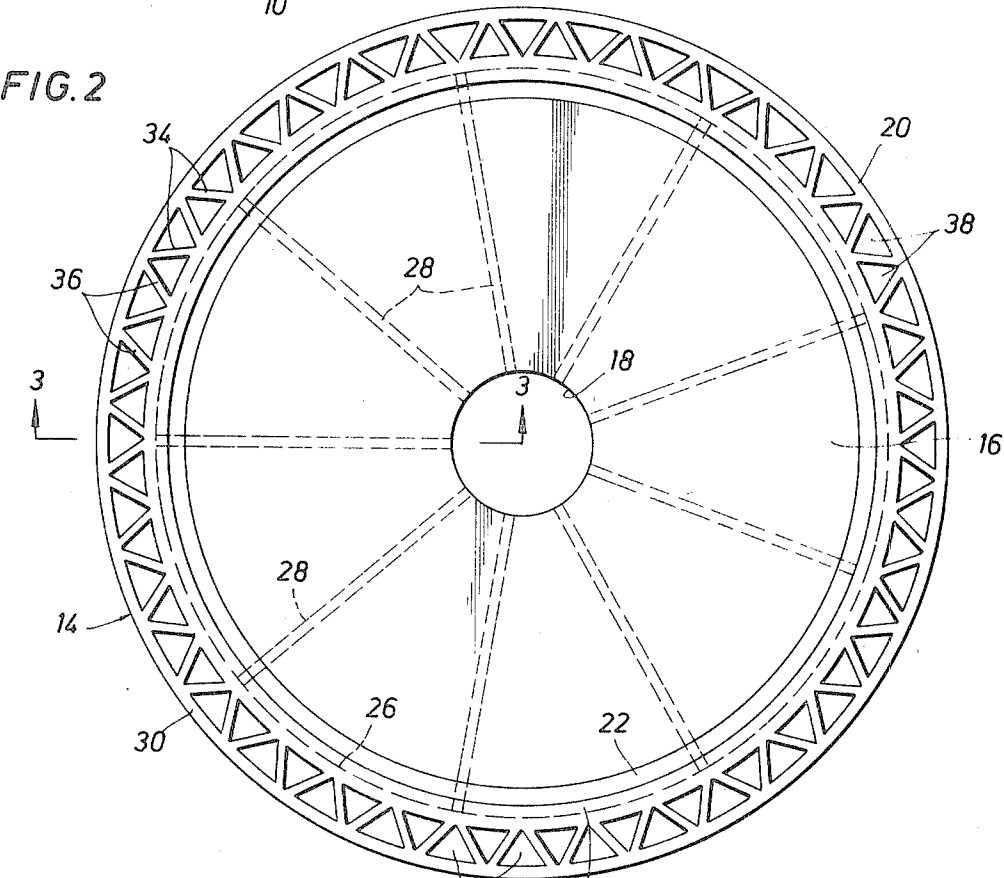


FIG. 3

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PAPER ROLL SHIPPING PLUG

BACKGROUND OF THE INVENTION

In the manufacture of paper, it is customary to form rolls of the same by winding the paper on a central core in the form of a tube, such rolls being then provided with plugs inserted into the ends of the tube to enable the rolls to be readily handled in shipment without deforming or otherwise damaging the rolls. In the case of large rolls of paper, such as newsprint paper, the central tube is relatively thin walled as compared with the diameter of the roll so that it becomes necessary to provide reinforcement in the form of shipping plugs which are of heavy and solid construction. Heretofore, shipping plugs for this purpose have usually been made of hard wood, of substantial length, and somewhat tapered to permit them to be readily inserted and driven tightly into the ends of the central tube. Shipping plugs of this type are expensive and heavy, and constitute a substantial item of cost in the production of paper.

Paper roll shipping plugs, other than wooden plugs, have been proposed for this purpose, such as metallic plugs formed of sheet metal, which have not, however, proven to be entirely satisfactory because of the high cost of the material and the relatively great expense to manufacture.

SUMMARY OF THE INVENTION

Briefly described, the paper roll shipping plug of the invention comprises an annular, generally wheellike device, preferably formed of molded plastic, having a central, flat, disklike portion and a peripheral rim portion of channel shape in cross section positioned with its sidewalls in radially spaced relation and to whose inner sidewall the central disk is peripherally connected. The central disk portion is disposed in a plane located mediate the ends of the inner sidewall of the rim and is connected to the edge of said inner wall at the open end of the channel of the rim by an inner, bevelled, peripheral portion and an outer annular portion located in a plane parallel to the plane of the central disk portion, to form a central recess of generally piepan shape on the outer face of the plug. The channellike rim is also provided with internal crosswebs which are disposed in angular relation to radii of the plug and extending for the full depth of the channel, and which form generally triangular cells in the rim open at the open end of the channel. The disklike portion and rim are connected by radially extending webs or fins which taper radially inwardly and which are connected at their outer ends to the inner sidewall of the rim. A central opening is provided in the plug for convenient use in handling the same and in removing the plug from the paper roll.

The outer sidewall of the channellike rim has a bevelled face at one end providing a taper for inserting the plug into the end of the central tube of the paper roll to allow the plug to be driven into the tube flush with the end of the tube.

Objects of the invention are to provide a paper roll-shipping plug which is of inexpensive manufacture and strong and rugged construction, which may be readily molded of plastic material and which is of somewhat yieldable character to permit the ready driving of the plug into tight engagement with the central tube of the paper roll when inserted therein.

BRIEF DESCRIPTION OF THE VIEWS OF THE DRAWINGS

FIG. 1 is a longitudinal, central, cross-sectional view, on a reduced scale, of a roll of paper showing the roll plug of the invention as applied thereto;

FIG. 2 is an end view of the paper plug of the invention, looking at the left hand end of the paper roll as illustrated in FIG. 1; and,

FIG. 3 is a fragmentary cross sectional view, taken along the line 3—3 of FIG. 2, looking in the direction indicated by the arrows.

DETAILED DESCRIPTION OF A PARTICULAR EMBODIMENT OF THE INVENTION

The paper roll plug of the invention is illustrated herein in connection with its application to a roll of paper such as that generally indicated at 10 in FIG. 1, such as a large roll of paper of the kind used by newspapers and other publications, commonly called newsprint, such rolls being often transported in large numbers by truck or other carrier.

Rolls of paper, of this and other types, are customarily wound around a central tube or tubular core 12 of the same length as the roll of paper, it being desirable to maintain such rolls in as nearly a perfectly round condition as possible to facilitate the rapid unreeling of the paper.

In the transportation of such rolls of paper, it is often necessary to place them in a number of courses on trucks or the like, the upper courses of rolls resting upon lower courses of the same, so that the lower rolls are subjected to heavy compression by the upper rolls. Moreover, in the loading and unloading of the rolls, they are often subjected to rough handling, so that there is a likelihood of flattening or otherwise misshaping or damaging the rolls, which may interfere with the smoothness of operation of the unwinding or unreeling of the paper.

The paper roll plug of the present invention is intended for insertion into the ends of central tubes of paper rolls to reinforce the same to prevent collapsing, misshaping or damage to the rolls during shipment.

As shown in the present illustration, the paper roll plug, generally designated 14, is of annular shape, having a central, flat, disklike portion 16, provided with a central opening 18 therein. The plug is formed with an annular rim 20 of generally U-shape in cross section, as best seen in FIG. 3, which is connected to the periphery of the central disk portion by a bevelled annular margin 22, surrounded by an outer peripheral marginal portion 24 disposed in a plane parallel to the plane of the disk portion 16, to provide a recess on the outer face of the plug which is more or less in the shape of a pie pan.

The rim portion 20 of the plug has an annular inner peripheral wall 26 connected to the marginal portion 24 at the open side of the rim, and which is also connected to the disk portion 16 by a number of radial webs 28 which taper radially inwardly toward the central opening 18. The outer peripheral wall 30 of the rim portion 20 is formed with a tapered face 32 adjacent the bottom of the U.

The U or annular channel shaped rim portion 20 has internal webs 34 and 36 extending across the interior of the U for the full height of the same, and which are disposed in angular relation to the radii of the plug to form generally triangular shaped open cells or compartments 38. The cross webs 34 and 36 reinforce the walls of the rim portion 20 to form a very strong structure which, due to the angular relation of the webs 34 and 36 to radii of the plug, allow a certain amount of yieldability, flexibility and resilience to the outer wall 30 when the plug is being driven into the end of the tubular core of the paper roll. Moreover, due to the planar position of the disklike portion 16 between the open and closed ends of the U of the rim portion 20, the rim portion is strongly braced thereby while allowing the closed end portion of the rim to yield somewhat radially inwardly to permit the tapered face 32 to readily enter the end of the paper roll to guide the outer wall 30 of the plug into tight wedging engagement with the inner face of the central tube of the roll.

The roll plug is preferably formed in one piece of suitable plastic material, such as polyethylene, or the like, by molding, and the thickness of the walls and webs of the plug may be substantially uniform throughout the entire structure to form a plug having great strength and resistance to deformation while at the same time being of light weight and economical construction.

In practice, the plugs are made in sizes to closely fit into the central tubes of various sizes with the outer walls 30 in tight engagement with the inner faces of the tubes when the plugs are driven home.

In making use of the invention, the roll plugs are fitted into the ends of the paper roll by inserting the tapered faces 32 into the ends of the central tube 12, and then pounding the plugs into place with a hammer or mallet until the outer walls 30 are tightly wedged into the tube and the plugs are flush with the ends of the same.

The roll plugs may be readily removed from the paper roll by gripping the disklike portion 16 through the central opening 18, or by the use of any convenient tool insertable in this opening.

It will thus be seen that the invention, constructed and used as described above, provides a paper-roll shipping plug of increased strength and economical construction, which is easily applied and which affords adequate protection in the handling of large rolls of paper.

Having thus clearly shown and described the invention, what is claimed as new and desired to secure by Letters Patent is:

1. A shipping plug for insertion in the end of a tubular core of a roll of sheet material, comprising
 - a generally disklike member having a central, planar, portion;
 - a rim surrounding said central portion and having an external annular face extending in both directions away from the plane of said central portion positioned for engagement with the surrounding internal surface of said core; and,

said rim being channel shaped in cross section with the bottom of said channel located on one side of said plane and the open portion of said channel on the other side of said plane.

2. The shipping plug as claimed in claim 1 wherein said member is formed with web portions extending between the sidewalls of said channel at uniformly spaced intervals throughout the length of the channel.

3. The shipping plug as claimed in claim 1 including radially extending fins formed on said member connecting said rim portion to one face of said central portion.

4. The shipping plug as claimed in claim 1 including annular shaped connecting means formed on said member connecting said central portion to said rim at a location on the rim spaced from said plane.

5. The shipping plug as claimed in claim 1 wherein said member is formed of molded plastic material of uniform thickness throughout the entire member.

6. The shipping plug as claimed in claim 1 wherein said face is formed with a bevelled portion located at one side of the plane of said central portion whose diameter is smaller than the internal diameter of said core.

7. The invention of claim 1 wherein said channel has a first angled externally exposed face and said channel has a second face intersecting said first face, said faces cooperating to form an exposed surface for contact with a roll of sheet material.

8. The invention of claim 1 wherein said member is formed with at least a pair of reinforcing webs approximately perpendicular to said central, planar portion and connected to said rim.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,627,221 Dated December 14, 1971

Inventor(s) Tally W. Nichols, et al

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet, [72], the inventor's name should read -- Tally W. Nichols --.

Signed and sealed this 24th day of October 1972.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents