Jan. 13, 1953 R. T. WHITE 2,624,989

METHOD OF PACKAGING ELONGATED ARTICLES

Filed Aug. 3, 1949

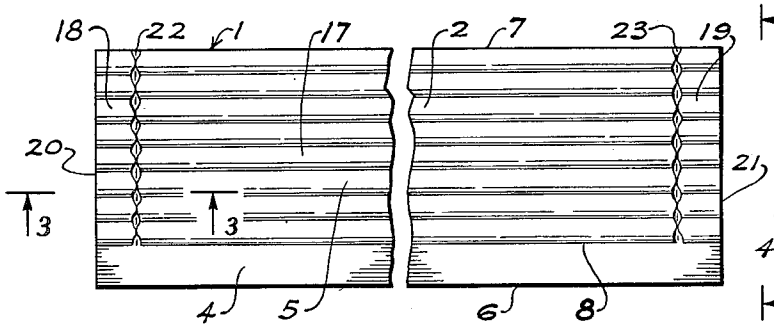


FIG. 1

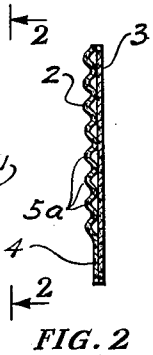


FIG. 2

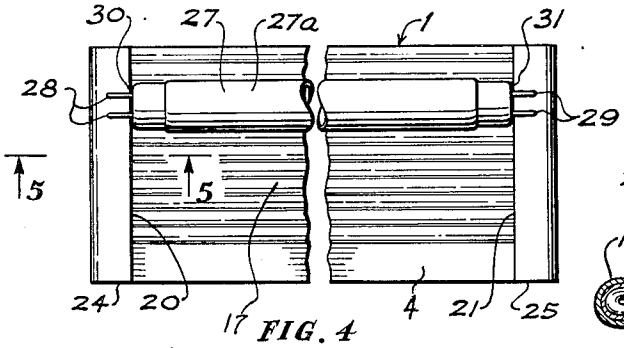


FIG. 4



FIG. 3

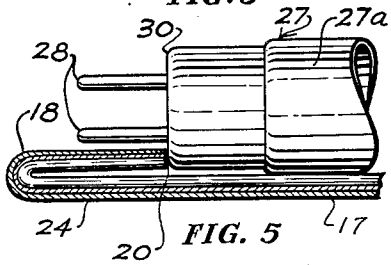


FIG. 5

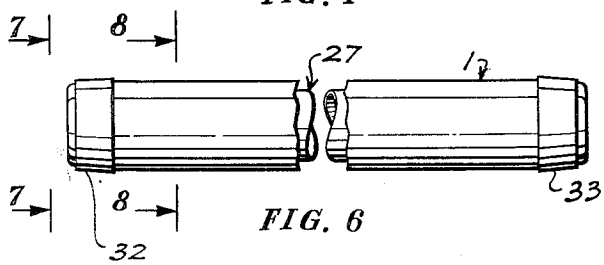


FIG. 6

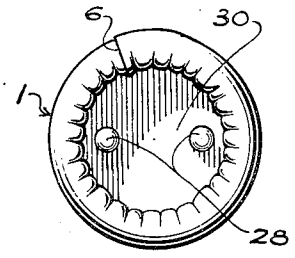


FIG. 7

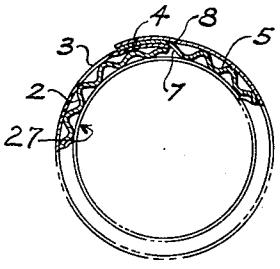


FIG. 8

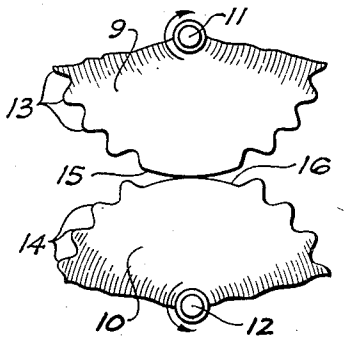


FIG. 9

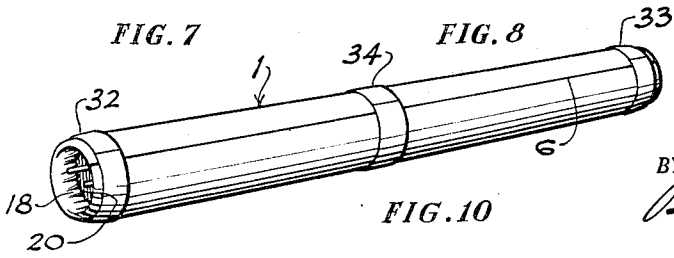


FIG. 10

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METHOD OF PACKAGING ELONGATED ARTICLES

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Application August 3, 1949, Serial No. 108,378

2 Claims. (Cl. 53—3)

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This invention relates to packaging elongated articles and more particularly to an improved corrugated paper package for protectively enclosing fluorescent lamp tubes or the like and an improved method of packaging such articles.

The general utility of fluorescent lamp tube packages or wrappers depends upon the measure of protection afforded the wrapped or packaged tube from harmful contact with outside objects. To be effective, the package or wrapper should not only protectively cover the glass portion of the tube but also the projecting contact prongs which extend from each end of the tube. Difficulty has been experienced with prior fluorescent tube packages with which I am familiar due to longitudinal shifting of the tube in the package with resultant injury to the contact prongs. Accordingly, it is an object of the present invention to provide a neat and compact fluorescent tube package which is completely effective as a protective covering for the tube proper and also for the contact prongs.

Further objects of my invention are: the provision of a fluorescent tube package that will prevent substantial shifting or shucking of the tube during shipment and handling and thus prevent damage to the tube by such movements; and the provision of an improved and economical method of packaging fluorescent tubes that permits the use of relatively heavy wrapping material and is particularly adapted to being carried out by automatic machinery.

These and other objects of my invention will appear from the following description of one form thereof, reference being had to the accompanying drawings in which:

Figure 1 is a plan view of the wrapper blank;

Figure 2 is an end view of the wrapper taken on line 2—2 of Figure 1;

Figure 3 is an enlarged fragmentary vertical cross sectional view taken substantially on line 3—3 of Figure 1;

Figure 4 is a plan view of the wrapper blank showing the end flaps folded inwardly and a fluorescent lamp disposed thereupon;

Figure 5 is an enlarged fragmentary vertical cross sectional view taken substantially on line 5—5 of Figure 4;

Figure 6 is a side elevational view of the finished package containing the tube;

Figure 7 is an end view of the package taken substantially on line 7—7 of Figure 6;

Figure 8 is a vertical cross sectional view taken substantially on line 8—8 of Figure 6;

Figure 9 is a fragmentary end view of a preferred arrangement of forming rolls adapted to be used to continuously form the corrugated paper from which the blanks are cut; and

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Figure 10 is a perspective view of my assembled package.

Referring now to the accompanying drawings, reference character 1 designates generally a blank of corrugated paper or board which may be cut from a continuous roll or strip of packaging material, the corrugated inner wall 2 of which is preferably formed by passage between forming rolls 9 and 10, seen in Figure 9 and explained in detail below, and consists of alternate flat or non-corrugated portions 4 and corrugated portions 5. The non-corrugated backing 3 is glued to the corrugated inner wall 2 in the manner well known in the art. Blanks 1 are formed by cutting equal lengths of this wrapping material along the junctions between flat portions 4 and the adjacent corrugated portions 5, thereby forming an outer edge 6 on the flat portion 4 and an outer edge 7 on the corrugated portion 5 of each blank. The flat portion 4 of blank 1 constitutes an integral securing flap which is joined to the corrugated portion 5 along the common edge 8 and which is adapted to hold the assembled package in a wrapped portion, as will be explained later.

In order to preform the inner wall 2 as described above, a pair of toothed forming rolls 9 and 10 (see Figure 9) may be used. The effective circumferences of these rolls are substantially the same as the overall length of blank 1, and the rolls are arranged to rotate on their respective axes 11 and 12 in proper forming relation to each other. Rolls 9 and 10 have radially projecting forming teeth 13 and 14 on their respective peripheries, which teeth are adapted to intermesh as the rolls rotate on their axes. Spring means, not shown, are preferably provided to yieldingly urge the rolls 9 and 10 together. Roll 9 has a curved blank portion 15 on its periphery which has the same diameter as the crown of the forming teeth 13, and roll 11 has a corresponding blank portion 16 on its periphery which has a diameter equal to the diameter of the root or base of the forming teeth 14. In other words, the roll 9 has a series of small forming teeth 13 and one large forming tooth 15 on its periphery, and similarly, forming roll 10 has a series of small forming teeth 14 and a large gap 16 therebetween on its periphery. Rolls 9 and 10 are caused to rotate in the directions indicated by the arrows by suitable power means (not shown) and they are pref-

erably interconnected to prevent relative circumferential slippage and insure proper register of the meshing portions thereof.

As a continuous strip of flat paper stock, which is to be formed into the inner wall 2 of my wrapping material, is fed between the rolls 9 and 10 (from right to left as viewed in Figure 9) the intermeshing teeth 13 and 14 thereon will form corrugations 5a in the sheet for a portion of its length corresponding to the corrugated portion 5. When the stock passes between the blank portions 15 and 16 of rolls 9 and 10, flat or non-corrugated portions 4 will be formed thereon. The non-corrugated backing 3 is glued to the inner wall 2 as it emerges from the forming rolls 9 and 10, and the individual blanks 1 are then produced by suitably shearing or cutting the continuous strip of wrapping material in the manner previously described.

The blank 1 has a central portion 17 and two end flap portions 18 and 19 having free outer edges 20 and 21, respectively. End flaps 18 and 19 are defined and separated from the central portion 17 of blank 1 by score or fold lines 22 and 23, respectively, which extend transversely of the blank 1 and the corrugations 5a in the inner wall 2 (see Figure 1). The score or fold lines 22 and 23 are substantially parallel to the outer edges 20 and 21 and may be formed on the inner corrugated surface of blank 1 by any suitable scoring or creasing means and it will be understood that these score lines may be formed in the strip of wrapping material prior to cutting blanks 1 from same if desired.

A fluorescent lamp tube or other elongated article may be packed in the above described blank 1 in the following manner. End flaps 18 and 19 are first folded inwardly on their respective fold lines 22 and 23, either manually or by a suitable folding mechanism, until the corrugated inner portions of the end flaps 18 and 19 overlie the adjacent corrugated portions of the central portion 17 of the blank 1, see Figures 4 and 5. The blank 1 in this folded condition has double-thickness or double-walled end portions 24 and 25 and a single-thickness or single-walled center portion.

The tube 27, which is to be wrapped in my package and which I have shown as a fluorescent lamp having an elongated substantially cylindrical center body portion 27a and projecting end prongs 28 and 29 (see Figures 4 and 5) is then disposed longitudinally upon the center portion 17 of the blank 1 with its ends 30 and 31 substantially in abutting engagement with the respective free edges 20 and 21 of end flaps 18 and 19. With the tube 27 thus positioned upon the folded blank 1 the projecting contact prongs 28 and 29 will overlie the inwardly folded end flaps 18 and 19 as shown in Figures 4 and 5.

The blank 1 is next rolled around the tube 27 so that the blank assumes the shape of a cylindrical tube, see Figures 6 and 10, with the single-walled center portion 17 enclosing the center body portion 27a of the tube 27. This wrapping operation may be accomplished by rolling the tube 27 within the blank 1 toward the flat portion 4 thereof either manually or by mechanical means. The double-thickness end portions 24 and 25 are concurrently formed into heavy tubular protective walls which enclose the contact prongs 28 and 29, respectively, of the tube 27.

The width of the corrugated portion 5 of blank 1, that is the distance between outer edge 7 and common edge 8, is made to be approximately pi (3.14) times the diameter of the particular tube 27 to be packaged and is therefore substantially equal to the circumference of said tube. Consequently when the blank is wrapped about the tube 27, the outer edge 7 of the corrugated portion 5 will lie substantially adjacent the common edge 8, and the flat portion 4 of the blank 1 will overlie the adjacent portion of backing sheet 3 (see Figure 8). The inner surface of flat portion 4 may be coated with a suitable adhesive, such as glue, to adhere the portion 4 to the backing sheet 3 and hold the blank 1 in wrapped position about the fluorescent tube 27.

When the blank 1 is wrapped about the fluorescent tube 27 as described, free edges 20 and 21 of the inwardly folded end flaps 18 and 19 become inwardly facing shoulders of the double-thickness portions 24 and 25 and substantially abut the respective ends 30 and 31 of the tube 27. Thus the tube 27 is securely held in position within the package 1 and cannot shift or shuck in a longitudinal direction within the package during handling or shipping thereof.

In order to supplement the securing action of the glue on flat portion 4 of the blank 1, or in some cases to supplant the glue and provide the sole means to hold the package together, tapes 32, 33 and 34 are wound about the package 1 preferably at each end and around the center thereof as seen in Figures 6 and 10. Tapes 32 and 33 are wound rather tightly about the end portions 24 and 25, respectively, so as to crimp the same and reduce the size of openings in the respective ends of the wrapper of package 1. This crimping provides a tight fit of the end portions 24 and 25 of the blank 1 at the ends 30 and 31, respectively, of the tube 27 and further insures that the tube 27 will not shuck or shift within the package. Tape 34 is wound about the center of the package to augment the securing and sealing thereof but it will be understood that in some cases the end tapes will be sufficient while in other cases several tapes may be required properly to hold the package between its ends.

By using my improved package and by employing the novel wrapping method described above, I am able conveniently and effectively to wrap fluorescent tubes or the like in relatively stiff and heavy corrugated paper or board. The past practice of folding over-lapping ends of tubular packages inwardly after the article has been wrapped precludes the use of relatively heavy corrugated paper or board because such material is too stiff and bulky to be tucked into the small open ends of such tubular packages, particularly packages of the rather small diameters required to fit fluorescent lamp tubes. By folding end flaps 18 and 19 inwardly on their respective fold lines 22 and 23 before placing the fluorescent lamp tube or the like thereupon and thereafter wrapping the fragile tube, I have overcome these difficulties and also provide most effective means for preventing longitudinal movement of the tube in the package and for protecting the end prongs of a fluorescent lamp.

While I have described the illustrated embodiments of my invention with some degree of particularity, modifications and changes may be made therein by those skilled in the art without departing from the spirit of my invention. Therefore, I do not wish to be limited to the particular embodiments illustrated and described above nor in any manner other than by the appended claims.

I claim:

1. The method of protectively packaging an elongated cylindrical article in corrugated wrapping material having a corrugated inner wall portion and a non-corrugated backing sheet secured thereto including, cutting a flat blank from said wrapping material, forming fold lines transversely of said blank and extending in a direction substantially parallel to the outer edges of said blank and defining end flaps and a central portion, folding both of said end flaps inwardly on said fold lines toward each other until the corrugated wall portions of said end flaps overlie the corrugated wall portion of the central portion of said blank, disposing the cylindrical article to be packaged on said flat blank between said outer edges of said inwardly folded end flaps with the ends of said article adjacent said edges, wrapping said material around said article, and securing said wrapping material in wrapped position.

2. The method of protectively packaging an elongated cylindrical article in corrugated wrapping material having a corrugated inner wall portion and a non-corrugated backing sheet secured thereto and fold lines parallel to and spaced from opposite edges thereof including, cutting a flat blank from said wrapping material, folding said blank inwardly on each of said fold lines to form end flaps, the corrugated wall portions of which overlie and are substantially parallel to the corrugated wall portion of the central portion of said blank, disposing the cylindrical article to be packaged on said flat blank between the edges of said inwardly folded end flaps with the ends of said article adjacent said edges, wrapping said material around said article, and securing said wrapping material in wrapped position.

RAY T. WHITE.

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