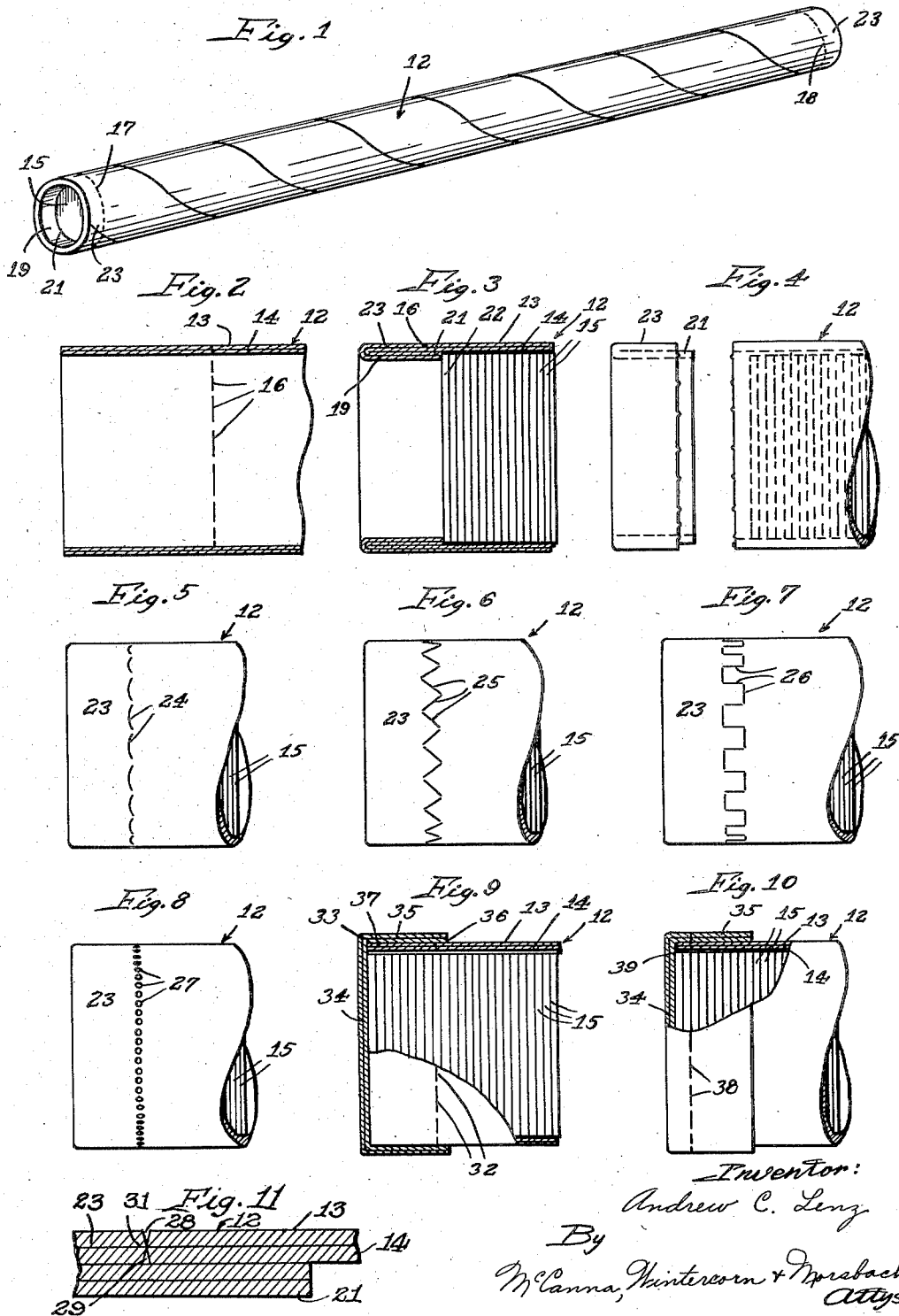


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BOTTLE CAP PACKAGE

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This invention relates to bottle cap packages, and is directed more particularly to packages for milk bottle caps and the like and to an improved method of making the same.

5 The customary method heretofore used for packaging milk bottle caps and the like has been to stack them in a stiff paper tube and then deform the ends of the tube or place a strip of tape over the ends thereof to hold the caps in the tube. This arrangement has been objectionable 10 due to the fact that the caps are used in a capping machine and the packages are inserted directly into the machine from which they are fed to the capper. The troubles have come largely from the difficulty in opening the pack- 15 age and the character of the opening formed in the package. In inserting the package into the capper it has been customary for the operator to tear off the end of the package. Frequently the tear is started by gripping the end between 20 the teeth, the operator then grasping the torn end to complete the removal of the end portion of the tube. This produces an objectionable character to the end of the tube because of the very jagged torn edge, which condition is ag- 25 gravated by the fact that the tube is made up of laminations of paper strips wound helically for the purpose of producing strength in the tube. Numerous devices have come onto the 30 market in the nature of cutting tools designed for the removal of the end of the tube, but these have never come into popular use and the operators have refused to use them for one reason or another.

35 In addition to the slowness and the physical effort involved in opening the tubes as described above, there is the further objection of the nature of the tear. The jagged edges on the end of the tube frequently interfere with the feed- 40 ing of the paper disks or caps out of the end of the tube when the package is placed in the capping machine. The caps fit rather snugly into the tubes and do not possess a great amount of weight so that slight irregularities in the 45 end of the tube will cause the cap to tilt and wedge in the end of the tube and thus fail to feed properly. Such irregularities are frequent- 50 caused in tearing off the end of the tube, and as a result, the operator must give frequent and almost constant attention to the feeding element of the capping machine in order to in- 55 sure that the caps are feeding downward properly from the package. This trouble not only arises because of the unevenness at the torn edge, but also because frequently the tube is

squeezed or distorted during the tearing process so that the caps are withheld at some point further along the tube.

An important object of the invention is to provide an improve cap package particularly adapted for use in capping machines and de- 5 signed to avoid the difficulties heretofore associated with the insertion of the packages into the machine and with the feeding of the caps from the package while positioned in the ma- 10 chine.

Another object of the invention is to provide an improved method for manufacturing a bottle cap package having ease of opening and strength for holding a cap during shipment. 15

Other objects and advantages will be apparent from the following description and the accompanying drawing, in which—

Figure 1 is a perspective view of a bottle cap package embodying my invention; 20

Fig. 2 is a fragmentary section showing the first step in the manufacture of the package;

Fig. 3 is a fragmentary section through the end of the package shown in Figure 1 showing the completed structure of the package; 25

Fig. 4 is a side view in the end of a cap package showing the end of the package removed;

Figs. 5 to 8 inclusive are fragmentary side views of the end of a package showing modified forms of perforations or openings for the re- 30 moval of the end portion of the package;

Figs. 9 and 10 are views similar to Figs. 5 to 8 but partly in section, showing a modified form in which the package embodies a cap completely covering the end of the tube, and 35

Fig. 11 is a section through the end wall of a package showing a further modified form of perforation.

The embodiment of the invention shown in the drawing includes a stiff paper tube designated 40 generally by the numeral 12, in this instance formed of two laminations 13 and 14 of paper wound helically upon each other so as to produce maximum strength in the tubes. These tubes which might be termed stock tubes, are formed 45 or cut into suitable lengths to hold a designated number of bottle caps. In the drawing I have shown a plurality of bottle caps 15 positioned in the package, the caps in this instance being in the form of flat disks, though the invention is not 50 in any way limited to this shape of the caps which may be caps of any conventional shape well known in the art. In accordance with the invention, the paper of the tube is perforated or cut through at spaced intervals in a line around the 55

tube and spaced from the end of the tube as best shown in Fig. 2, the perforations in this instance being in the form of straight cuts passing completely through the tube, as shown at 16. Conveniently the tube is perforated at both ends as shown at 17 and 18 for removal of either or both ends from the package, though in some instances only one end of the tube need be so treated. After the tube is formed and perforated as shown in Fig. 2, the extreme end of the tube is folded inward so as to lie along the inner wall of the tube as shown in Fig. 3, the inwardly projecting flap 19 being folded in to a distance beyond the perforations 16 as shown at 21 so that beyond the last cap 22 of the stack the tube has inner and outer walls comprising the flap 19 and the portion 23 of the tubular side wall. Thus the flap 19 serves to reinforce the tube along the area bearing the cuts 16. The inner end of the flap 19 serves as an abutment for the cap 22 to prevent the caps from sliding out of the tube, and thus this flap forms an end for the package. In use, one of the ends of the tube is folded to the position shown in Fig. 3, the caps are then inserted into the tube, and thereafter the opposite end of the tube is folded in in like manner so that the flap will bear loosely against the end member of the stack of caps. This prevents egress of the caps and also acts to prevent warpage of the caps while in the package, which otherwise frequently occurs and which in turn interferes with the cap feeding operations.

The package is shipped to the bottling plant in the form shown in Figs. 1 and 3, and in order for the operator to insert the package into the capping machine, it is simply necessary for him to grasp the package with one hand at a point intermediate the ends and with the other hand grip the end portion 23 thereof. With a slight compression of the end 23 and a twisting motion the stock of the tube is torn off between the cuts 16 so that the tube parts at the perforations, the end portion of the tube including the portion 23 and the flap 19 being removed as shown in Fig. 4. The operator then inserts the remainder of the tube into the capping machine with the open end down. It will be seen that this operation produces a substantially clean break at the end of the tube with no rough tears or edges which may project into the bore of the tube and interfere with the passage of the caps out of the tube. Preferably when the perforations or cuts 16 are made the cuts are formed from the inside of the tube so that the slight distortion of the paper adjacent the cuts is formed on the outside of the tube rather than on the inner surface thereof, thereby leaving the mouth of the tube smooth upon removal of the end portion as heretofore described.

The perforations may take a number of different forms. For example, in Fig. 5 the perforations are in the form of arcuate cuts 24 spaced annularly of the tube. In Fig. 6 the cuts 25 are arranged in the nature of saw teeth, whereas in Fig. 7 the cuts are arranged in the form of three sides of a triangle, as shown at 26. In Fig. 8 I have shown a form in which the cuts are in the nature of small holes 27 spaced annularly of the tube. In each of these instances the end or flap 19 is folded in in the same manner as shown in Fig. 3, the flap serving to reinforce the tube in the perforated area, and likewise to retain the caps in place in the tube.

In Fig. 11 I have shown a form in which the cuts are positioned on opposite sides of the tube

and do not pass completely through the walls thereof, the cuts consisting of an outer annular and continuous cut 28 extending partway through the tube, and an inner cut 29 also extending partway through in the same transverse plane, leaving a small amount of stock as shown at 31 between the bottoms of the two cuts. This form has the advantage in that it produces a completely smooth and clean cut area on both the inner and the outer surfaces of the tube when the end portion is torn away.

In Fig. 9 I have shown a modified form of the invention wherein the end portion of the tube is not folded in but in which the perforations are made at a point closer to the end of the tube than the perforations 16, as shown at 32. In order to close the tube, retain the caps in place, and reinforce the tubular side walls in the perforated area, I provide a cap 33 having a central portion 34 and side walls 35 telescoping over the outer side of the tube 12 to a point beyond the perforations 32 as shown at 36. In this form the central portion 34 serves to retain the cap in place, and the sides 35 serve to reinforce the walls. The cap may be glued to the extreme end portion 37 of the tube if desired, or a tight friction fit may be relied upon.

In the form shown in Fig. 10 the package is constructed substantially as that shown in Fig. 9, except that the perforations 38 are in this instance formed in the side walls 35 of the cap adjacent the central portion 34, and in this instance the portion 39 of the tube serves to reinforce the cap in the area of the perforations, the central portion 34 in this instance also serving to retain the caps in position. In the form shown in Fig. 9, the package is opened by severing the tube along the perforations 32 and removing the cap and the side wall portion 37, whereas in the form shown in Fig. 10, merely the central portion 34 and a portion of the side wall 35 of the cap is removed in opening the package. However, in each instance the same functions are performed in substantially the same way, the perforations merely being placed on alternate parts of the cooperating elements.

It will be seen that in each form when the tube is opened by removal of the end portion, a substantially coplanar smooth edge is formed without any internal projections so that the end of the tube seats nicely and flush against its support in the magazine of the capping machine, whereby as the caps pass downward out of the end of the tube, there is no tendency for the caps to tilt or to wedge and thus be held up so that the supply of caps to the feeding mechanism will be interrupted. It will likewise be seen that the package is held securely closed during shipment and handling, but that upon the application thereto of a particular type of force, the clean coplanar severance just described is produced without the use of excessive force such as might destroy or crush the remainder of the tube, and that the nature of this force is such that there is but little likelihood of it being applied to the tube accidentally. The result is a package which is strong in use but is easily opened for discharge of the caps.

I claim:

1. A bottle cap package comprising a paper tube of uniform diameter throughout its length having perforations therein extending annularly thereof in a plane spaced from the end of the tube, the end portion thus formed beyond the perforations being bent inward upon itself

and lying along and in contact with the inner face of the wall of the tube to a point inwardly of the perforations to reinforce the tube and to retain the caps in position within the tube.

2. A bottle cap package for disk-like milk bottle caps comprising a cylindrical paper tube of substantially uniform diameter throughout its length shaped to receive in closely fitting peripheral relationship a stack of bottle caps extending from end to end thereof, said tube having an annular row of perforations in a plane spaced from the end thereof a distance sufficient to be gripped by the hand of the operator to provide an annular line along which said tube may be cleanly torn by twisting movement of the end portion of the tube with respect to the remainder thereof, and means on the removable end portion positioned inwardly of said perforations to bear against the endmost cap of said stack to maintain the caps in surface contact and to retain the caps in the tube.

3. A milk bottle cap package for disk-like milk bottle caps adapted for reception in cap feeding relation to a mechanical capper compris-

ing a cylindrical paper tube of substantially uniform diameter throughout its length shaped to receive in closely fitting peripheral relationship a stack of bottle caps extending from end to end thereof and to seat in endwise abutment against said capper for the successive dispensing of caps therethrough, said tube having an annular row of perforations in a plane spaced from the end thereof a distance sufficient to be gripped by the hand of the operator to provide an annular line along which said tube will part sharply upon twisting movement of the end portion of the tube with respect to the remainder thereof to thereby provide an open end of uniform shape characteristics for seating in said machine and for unobstructed passage of caps progressively therethrough under feeding action of said capper, and means on the removable end portion positioned inwardly of said perforations to bear against the endmost cap of said stack to thereby maintain the caps in surface contact and to retain the caps in the tube during handling.

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