METHOD OF PACKAGING CONFECTIONERY

Murray Weintraub and Elvin D. Angeli, Chicago, Ill., assigns to Miko Products, Inc., Chicago, Ill., a corporation of Illinois

Filed Dec. 30, 1958, Ser. No. 783,809

1 Claim.

(CL. 99-160)

This invention relates to tubular packaging, as of material in granular, pelleted, or other suitable form. Its principal object is to provide new and improved filled tubular packages, together with a new process and new apparatus for producing them.

Packaging of substances in tubes, of the character of waxed-paper drinking straws, or the like, covers both filling the substance into the tube and closing both ends of the tube in such a manner as to assure safe and tight preservation of the substance until the tube is opened for use of the substance. Among the substances so packaged are candies, sweetened drink mixes, and related confectionery items.

Known methods of packaging substances in tubes require a great deal of expensive hand work, after resulting in packages of poor quality.

According to the invention, the end closures are relatively secure against opening or easing seal, and the required hand work is greatly reduced.

In a preferred embodiment of our invention, the tubes employed are artificial waxed-paper straws of the type commonly used for drinking purposes. Straws of this type usually comprise two overlapping waxed banding servings of spiral waxed paper acting essentially as a homogeneous tube.

Further, according to the invention, one end of the open tube is closed, by a pressing, crushing, or spinning operation, following which a batch of the prepared tubes are filled with the desired material, and the open end of each tube is then closed. When a tight seal against moisture is desired, both ends of the closed package may be wax dipped.

Features of the invention relate to the spinning closure of the second end of the package, in addition to closing the first end when desired. According to this feature, a spinnin 5 tool is employed having an axial bore to receive the filled tube and spin it closed to a dome-like configuration. Preferably the inside of the spinning bore is tapered and is roughened to grasp the material of the tube to enhance its folding and crowding together to its desired closed position. This roughening may be accomplished by a series of saw cuts through the side walls of the tool, with indentation in the defining wall of the bore (as by swaging) between the saw cuts.

The above-mentioned and other objects and features of the invention and the manner of attaining them will become more apparent, and the invention itself will be best understood, by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, comprising FIGS. 1 to 15, wherein:

FIG. 1 is a view, partially sectioned, of a tube with two open ends;
FIG. 2 is a view of a tube one end of which is closed in a shape of a round trough;
FIG. 3 is an end view of the straw shown in FIG. 2;
FIG. 4 is an end view of a tube, one end of which is closed in a shape of a trough with an angular bottom;
FIG. 5 is an end view of a tube, one end of which has been closed by a notching and subsequent pressing operation;
FIG. 6 is a view of a tube, one end of which is pressed flat with a tongue-like portion cut out and bent back;
FIG. 7 is a side view of the tube shown in FIG. 6;
FIG. 8 is a view of a tube (partly broken away) one end of which is closed in a dome-like shape;
FIG. 9 shows an arrangement for filling a batch of tubes with a substance;
FIG. 10 is a front elevation of an arrangement showing the closing of a tube end by a spinning tool secured to a motor shaft;
FIG. 11 is a cross-section of a spinning-closing tool;
FIG. 12 is a right end view of the tool in FIG. 11;
FIG. 13 is a view of a tool similar to that shown in FIGS. 11, 12, but provided with saw-cuts in its side walls;
FIG. 14 is a right end view of the tool shown in FIG. 13, and
FIG. 15 shows five examples of tubes having various combinations of end closures.

Referring to FIG. 1, the initial or basic material for making tubular filled packages may be a tube with two open ends such as shown in FIG. 1. The tube may be made of a relatively hardy material, such as plastic, cellulose, or paper.

In a preferred embodiment of this invention, the tube employed is, as stated above, an artificial waxed paper straw 11, having a wall 12 and open ends 13 and 14.

The process of making filled tubular packages comprises three major stages, i.e.: (1) closing the first end of the tube; (2) filling the tube; and (3) closing the second end of the tube.

The closing of the ends of the tubes may be done as illustrated in FIGS. 2 to 8, in various shapes, varying in degrees of utility as hereinbefore described.

Referring particularly to FIGS. 2 to 7, the end closures may be made by a pressing-crushing operation, as by the action of a male and female member as in a punching press or the like, on the open tube-end from two opposed sides, whereas an end-closure according to FIG. 8 is made by a spinning operation as hereinafter described.

FIGS. 2 and 3 show a type of end closure resulting from a pressing-crushing action of members 31a and 31b having positive and negative cylindrical configurations respectively on an open end of straw 22. The end closure has a shape of a round or cylindrical trough, as defined by lines 23, 24, 25 and 26.

This trough-like closure has the following advantage over a flat type closure as generally shown in FIG. 6 (assuming for the sake of comparison it is without the tongue-overlap 69, 70):

It is well known that owing to natural stress conditions prevalent in the upper lip 63a and lower lip 63b (see FIG. 7), after the straw end has left the pressing device, the lips tend to move apart again, the upper lip tending upwardly and the lower lip tending downwardly, resulting in a slight opening between the two lips. In the trough-like end closure, however, the same stresses yield a different result. The upper lip 28, by tending to move upwardly, exerts a certain pressure on the ends of lips 19, 29 to expand outwardly, whereas the lower lip 29, by tending to move downwardly, exerts pressure on ends 19, 29 to contract inwardly. The result is a neutralization and stabilization effect on lips 28, 29, and, therefore, a good closure without a tendency to open up is achieved.

Referring now to FIG. 4, the pressing-crushing members 41a and 41b have a positive and negative angular cross-section. The resulting end closure has again a trough-like configuration, but the bottom of this trough has an angular shape, as defined by angle 43, lip portions 46, 47 on one side of the angle and lip portions 48, 49 on the other side thereof. As to the degree of tightness of this type of closure, stress conditions are similar to those described for the round-trough closure shown in FIGS. 2 and 3, distinguished only by an additional element of rigidity contributed by the angular formation of the bottom of the closure.
FIG. 5 illustrates an example of a method to employ four pressing-crushing members instead of two for making an end closure, acting in two directions, perpendicular to each other.

In the illustrated example, the open end of the straw is first notched on the left and right side by angular members 51a and 51b forming notches 54 and 55 respectively. On retraction of the horizontal members 51a, 51b, vertical members 51c, 51d having a flat face perform a pressing-crushing action on the open straw end forming the flat inner edge 58 and lower lip 59. The resulting shape of the end closure may be defined as double trough formation, the troughs placed with their open sides on each other, each having a flat bottom and inwardly sloping side walls. The advantage of this type of end closure shall be seen in an additional degree of rigidity brought about by an additional number of crease formations. This type of closure has six creases as compared to three in the example of FIG. 4, and two in the example of FIG. 3.

Referring now to FIGS. 6, 7, this type of end closure is made in substantially two operations. The first operation is similar to the flat-crushing operation as performed by members 51c and 51d in the example of FIG. 5, as previously explained. By this operation the end of wall 62 of tube 61 is pressed into flat upper and lower lips 63a, 63b respectively, which are connected to the main body of the tube 61 by sloping upper and lower tube halves 65, 66 respectively.

In order to counteract the noted natural stresses in lips 63a, 63b, tending to open up the closure, a second operation is performed consisting in shearing out of lips 63a, 63b, tongue-like portions 69, 70 and bending them back (see FIG. 7). This bending feature may have a vice-like effect on the lips, especially considering the effect of the U-shaped cross-section made up of lower lip portion 63c and upper tongue 69.

The end closure as disclosed in FIG. 8 is a closure that is not achieved by a pressing-crushing operation, as in all the examples heretofore described, but by a spinning action of a tool specially adapted to carry out this operation. As shown in FIGS. 10, 11, 12, the tool 101 made of steel is secured to a motor shaft 102 of a motor 103 as by a set screw 116. The tool itself is best shown in FIGS. 11, 12 and a somewhat differing embodiment in FIGS. 13, 14. Instead of securing the tool 101 by mounting on a motor shaft, an alternate arrangement may be had whereby the tool-end may be a rod that is mounted in a motor-driven chuck or the like. The front end of tool 101 is composed of a cylindrical or similar head 112 having an axial bore 113 for receiving the open end of the straw. The axial bore 113 consists of a blind end 117 in a shape of a semi-spherical dome, a cylindrical portion 118 and a conical opening 119.

For making an end closure to straw 104, the straw 91 is placed on a guide member 105 and axially moved towards tool 101 spinning at high speed. The enlarged conical opening 113 of the tool facilitates easy insertion of straw 104 into axial bore 118. The indentations 114 at the end of bore 118 perform a roughening operation on the open end of the straw and finally the semi-spherical blind end portion 117 of bore 118 performs a folding and crowding action on the roughened open end of the straw, forming it into a dome-like enclosure.

Referring to FIGS. 13, 14, the roughening action may be further improved by providing radial saw slots 137 in the wall of tool head 132. Conveniently, saw slots in a 70 cylindrical body are made in even numbers, but an odd number of slots made on a milling machine may avoid a pulsating effect of diametrically opposed slot pairs and improve the continuous character of the folding and closing operation.

Referring now to FIG. 9, the filling of the straws, one end of which has been closed by one of the methods described heretofore, is preferably done by placing a relatively large number of straws 91 uprightly in a preferably perforated basket 92 which is located in a relatively deep pan 93 and pouring the filling substance 96 from a container 94 into open ends 95 of straws 91. Any overflowing particles of substance 96 may go through the perforations of basket 92 into pan 93, where they may be collected for another pouring action. The filling substance, such as candies and the like, may comprise particles or granules which are generally small in comparison to the diameter of the tube. During the filling operation, a tapping or shaking action enhances the degree of packing of the substance within the tube.

Referring to FIG. 15, the two ends of the straw may be closed by any one of the methods illustrated in FIGS. 2 to 8, although preference may be given to a combination wherein closing the first end of the straw may be performed according to one of the methods shown in FIGS. 2 to 7 and the closing of the second end, or the open end of the filled straw, be made according to FIG. 6. For this reason being, as shown in FIG. 10, the closing tool is arranged at a certain pitch to prevent spilling of the filling substance from the open end of the straw.

To enhance further the tightness of the closure, any one type of the ends closed in connection with methods shown in FIGS. 2 to 8, may be dipped into a hot paraffin bath and subsequently allowed to cool in a normal room temperature, thus assuring absolute tightness of the closure.

While we have described above the principles of our invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of our invention.

We claim:

The method of packaging confectionery material in open-ended artificial straws of the type commonly used for drinking purposes, which comprises: closing one end of each straw by pressing from two opposite sides at one end portion of the straw to crush the side walls thereat into closed-end position, dipping the closed end of the straw in melted wax and permitting it to cool in normal room temperature, supporting a group of the one-end-closed straws upright above a wide receptacle, filling the supported straws by pouring the material to be packaged into the open end thereof while vibrating the group of straws and spinning the second end of each filled straw closed by roughening and rotating said second end while exerting longitudinal pressure along the axis of the straw thereby to press and hold the sidewalk portions together into a dome-like closed head, while maintaining the filled straw sufficiently upright to prevent spilling of the contents during the spinning operation.

References Cited in the file of this patent

UNITED STATES PATENTS

1,254,115 Brand Dec. 18, 1918
2,102,920 Savage Aug. 21, 1938
2,342,969 Rich and the semi-fab Sept. 9, 1938
2,449,487 Herzog Feb. 29, 1944
2,518,970 Zabel Aug. 6, 1950
2,609,735 Farrell et al. Sept. 1, 1952
2,700,328 Claus Jan. 25, 1955
2,761,783 Seger Sept. 14, 1956
2,769,377 Jenning et al. June 6, 1957
2,867,536 Meade et al. June 6, 1959
2,901,357 Epstein Aug. 25, 1959