Jan. 6, 1970 H. E. GALE 3,487,965

DEVICE AND METHOD OF DISPENSING CONTAINER CONTENTS

Filed May 17, 1968 2 Sheets-Sheet 1

Fig. 1

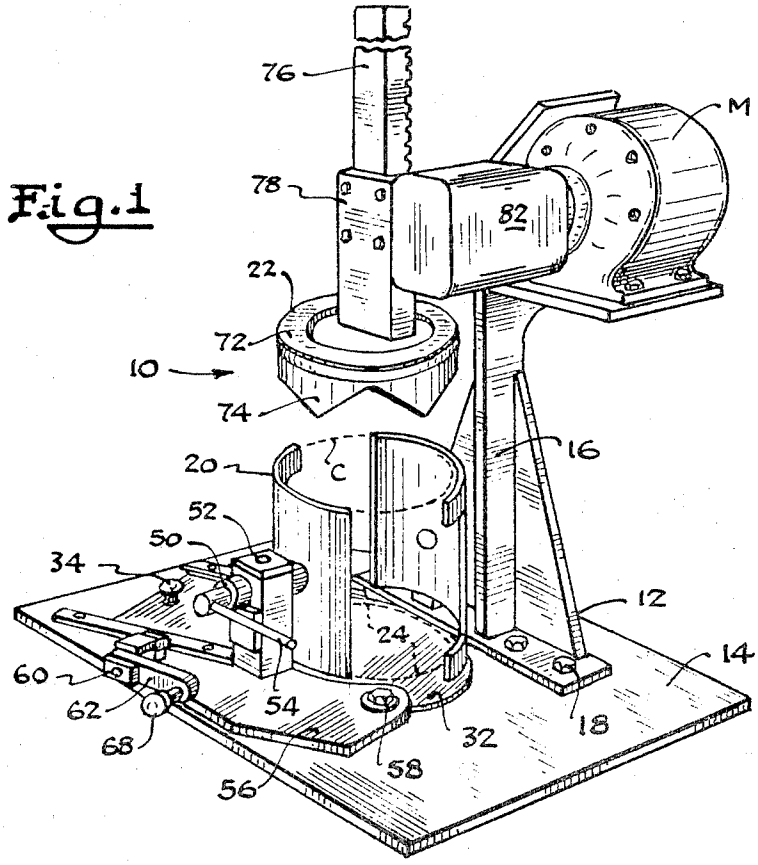
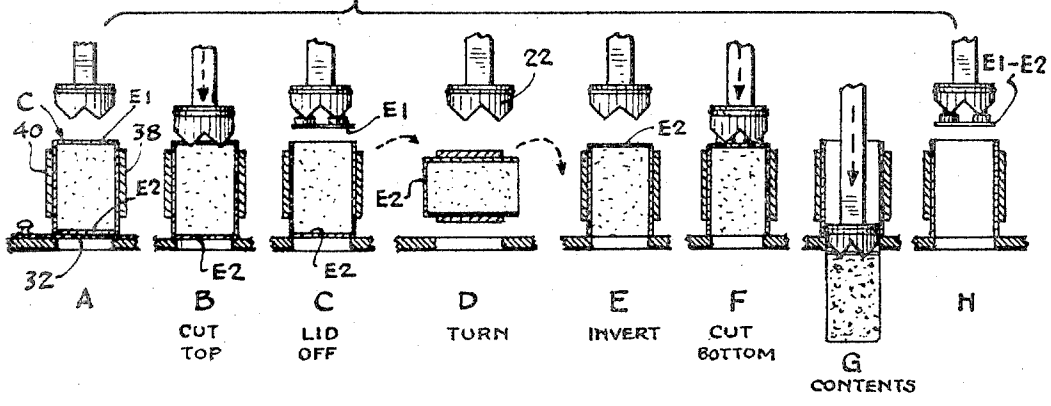


Fig. 2



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DEVICE AND METHOD OF DISPENSING CONTAINER CONTENTS

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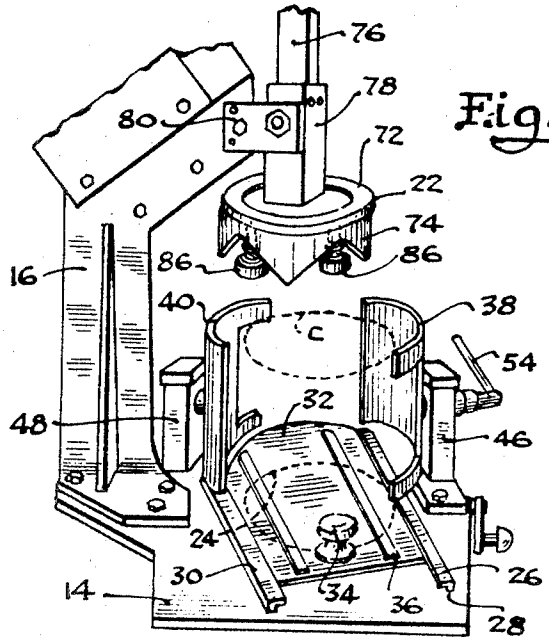
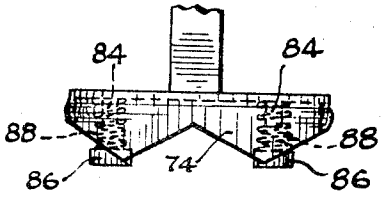


Fig.3

Fig.5



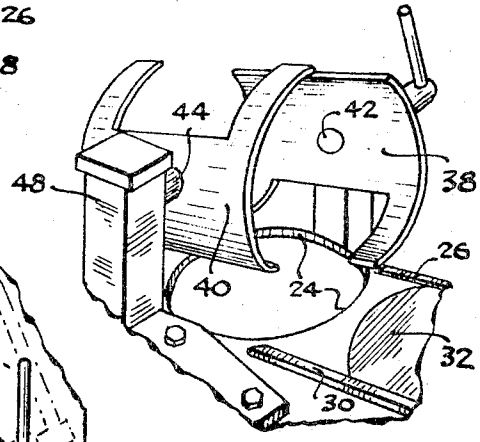
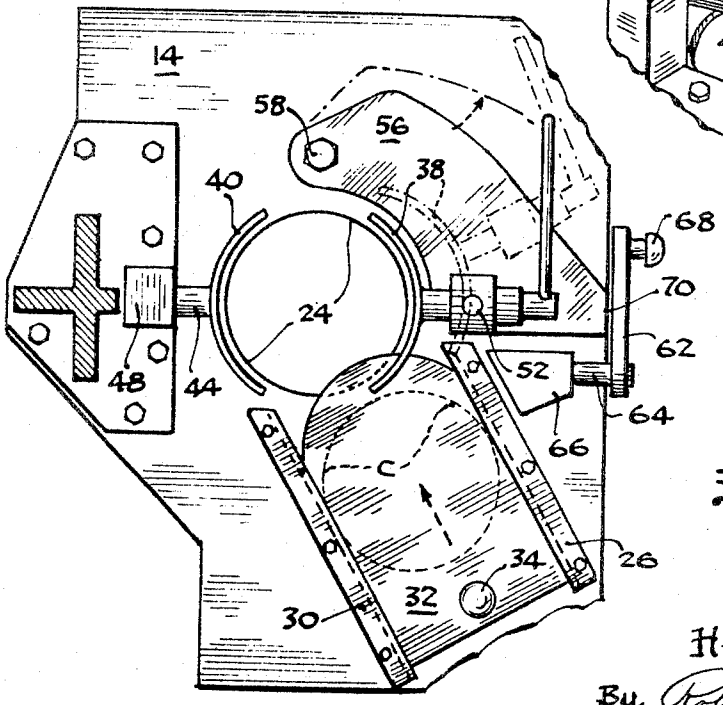


Fig.6

Fig.4



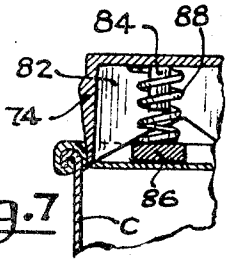


Fig.7

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DEVICE AND METHOD OF DISPENSING CONTAINER CONTENTS

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Int. Cl. B65b 69/00; B67b 7/38

U.S. Cl. 214—152 5 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates both to a structure for a combination can opener and dispenser and to the method of dispensing contents of a container therefrom. More particularly the invention assumes the existence of a straight sided regularly shaped container whereby each end thereof is sequentially severed from the body portion thereof whereupon the cutting device which accomplishes such container end removal is moved axially of the container body so as to force the contents therefrom into a dispensing means operatively associated with such cutting device. Rotatable clamp means are also provided for grasping the sides of the container body so as to initially position the container in an upright position whereupon the first end may be severed from the body thereof and after which the clamp means may be rotated to an alternate upright position of the container whereupon the remaining end is severed from the container body. During the second severing stroke, the cutting device is moved axially of and within the body of the container so as to aid in removing the contents therefrom.

BACKGROUND

Since the removal of material packaged within containers has been a problem for many years, there is much prior art on the subject. Applicant is aware of the following U.S. patents which contain disclosures of pertinence to the present invention and to an extent comprise commercially acceptable approaches for removing the contents of a container under particular conditions. Thus, U.S. Patent 2,728,983 discloses means whereby the closure ends of a container including a segment of the body portion thereof may be completely severed from the container so as to gain access to the contents therein. Therein it should be noted that patentee (column 1 of the specification) points out some of the shortcomings of other prior art devices and sets forth structure whereby such disadvantages are avoided. The present invention sets forth other novel apparatus for accomplishing a similar result and an improved method for removing the contents therefrom. The novel apparatus and improved method of the present invention accomplishes its desired results with less container handling and more positive removal of the container contents than offered by the above patentee's solution to the problem. The present invention also avoids the prior art shortcomings set forth by the above patentee.

Other structures and operations thereof are shown in U.S. Patents 2,656,881 and 3,079,683 wherein cutting means are provided to remove but one end from the container whereupon the contents thereof are removed by some assumed means (not shown) and, thereafter the other container end may also be removed and thereafter the remaining container portion crushed or otherwise disposed of.

In addition to the above, U.S. Patent 2,622,316 provided means whereby both of the opposed ends of a container may be substantially completely severed from the body at one time once the contents thereof have been dispensed therefrom by other means (not disclosed) so as to facilitate the later crushing and salvage thereof. Other related structures and operational methods pertinent to the instant inventions are shown in U.S. Patents 2,913,821, 2,984,375 and 3,060,567.

SUMMARY

The novel method of dispensing the contents of the container set forth in this invention includes the steps of positioning a container, generally a cylindrical container having round ends at either end thereof, above a receptacle or other means for receiving the contents thereof. Thereafter the container is firmly held in position whereupon the upper end thereof is completely severed from the body. Thereupon the container is rotated so as to place the thus severed open end in position above the receiving means after which the other end is similarly completely severed from the body by a cutting means which thereafter continues downwardly through a major portion of the container body itself. In this way the severed portion of this other end is continually forced by the cutting means into engagement with the material remaining in the container in a piston like fashion so as to facilitate its removal from the can body. Apparatus having distinctive characteristics is further provided so as to accomplish the aforementioned method aspects of the invention.

Accordingly, it is therefore an object of this invention to provide a novel method of dispensing the contents from a container which avoids prior art limitations and which lends itself to facile accomplishment in an industrial environment.

It is a further object of this invention to provide novel apparatus for the dispensing of contents of a container, which structure is simple and uncomplicated in operation and which overcomes the above referred to limitations of prior art structures.

A still further object of the invention is to provide an apparatus of the class described wherein means are provided for firmly grasping a container in an initial upright position, removing the upper closure end thereof completely from the body by a punch-action type cutter, rotating the container 180° so as to place the thus opened end in operational association with means for receiving the contents of the container, and thereafter completely severing the remaining end of the container on the now upper most portion thereof and by such cutter, and continuing the downward movement of the cutter so as to entrap the severed end thereof whereby the contents are contacted by such severed end so as to insure the substantial complete removal of the contents from the body of the container upon further downward motion of the cutter.

Other objects and advantages of the invention will become apparent from the following portion of the specification, the claims and the attached drawings.

DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of a preferred embodiment of the combination container opening and dispensing structure of the present invention.

FIGURE 2 is a pictorial representation of the sequential operation steps illustrating the method aspects of the present invention.

FIGURE 3 is also a perspective view of the apparatus of the present invention but taken from a point of view removed from that shown in FIGURE 1 of the drawings.

FIGURE 4 is a top plan view of the structure of the present invention and shows in particular positioning means by which a container is positioned within the overall structure and the relative cooperation of such positioning means thereof.

FIGURE 5 is a partial elevational view on an enlarged scale of the cutting means of the present invention and shows in particular the means by which the severed container closure end is held within the confines of the overall cutting element.

FIGURE 6 is also a partial perspective view on a somewhat enlarged scale showing the container grasping means in partially rotated position, and

FIGURE 7 is a cross-sectional side elevational view on an enlarged scale showing in particular the co-action between a closure end and the cutter element; further demonstrating the wiping action whereby the severed edge of the closure end is forced into engagement with the side body portion of the container.

DESCRIPTION

Referring to the drawings in more particular to FIGURES 1, 3 and 4 thereof, the combination opening and dispensing apparatus of the present invention is generally indicated by the reference numeral **10**. The combination container opener-dispenser **10** includes a support generally indicated by **12** comprising a generally horizontal plate **14** and an elevated column **16** which may be rigidly attached to the plate by means of bolts **18**. The combination cutter dispenser **10** further includes container positioning and grasping means **20** and cutting means **22** mounted in axial alignment above said positioning and grasping means **20** as will hereinafter be more clearly brought out.

The plate **12** which may be mounted on a table top provided with elevated legs of the like is further provided inwardly of its peripheral extent and preferably generally centrally thereof, with an opening **24** which is in turn operately associated with means for receiving (not shown) the contents of a container to be opened. In operation a container C which is preferably of cylindrical configuration and having end closures E–1 and E–2 is positioned above and in alignment with said opening as shown best by the dotted to solid line transition in FIGURE 4. To provide such positioning of the container C a pair of rails **26** are provided on top of the plate **14**, which guide rails **26** are oriented from a feed position towards said opening and terminate at the outer periphery thereof. Such guide rails **26** are generally of inverted L-shape cross-sectional configuration as may best be seen in FIGURE 3 of the drawings and comprise a base **28** and an upper run **30**.

A container positioning slide **32** of generally planar construction and having an arcuate forward configuration is positioned between the guide rails **26** in such a manner that any upward movement thereof is restrained by the upper runs **30**. The slide **32** is freely slidable from an initial position distal from the opening **24** at which position a container C is placed in contact therewith to an alternate position proximate and overlying the opening **24** so as to position such container C in overlying alignment with such opening **24**. The slide is further provided with a handle member **34** for ease in initiating reciprocal movement thereof and preferably with a pair of container supports **36** which are slightly raised from the upper surface of the slide and provide minimal frictional contact with the base of a container so that the slide **32** may be withdrawn from its alternate position proximate the opening as shown best in FIGURE 3 to its initial removed position while permitting the container to remain in the thus desired position.

After the container C is placed in such aligned and oriented position above the opening **24**, it is retained in such position by means of a pair of arcuately shaped clamping members **38, 40** which are adapted to firmly grasp peripheral portions of the container body. It should be brought out that the shape of these clamps **38, 40** will be similar to the outside peripheral configuration of the container, the contents of which are to be dispensed, and accordingly may be of various open angled configurations

to conform to rectangular, square or other container configurations. Each clamp **38, 40** is mounted for rotation about respective shafts **42** and **44** which are in turn supported by respective post members **46, 48**. The post member **48** is in turn affixed to the plate **14** by convenient means such as by welding or bolting thereto. The clamp **40**, as will hereinafter be more clearly brought out, may be considered as a following clamp and is accordingly mounted on its respective shaft **44** for free rotation thereabout through an arc of at least 180°.

The other clamp **38** is also adapted for rotation through an arc of at least 180° but it is mounted for positive, rather than free rotation. Thus, the shaft **42** is provided with a portion extending from the opposite side of the post **46** and is mounted within a bushing member **50** which is in turn positioned within the post by such means as the set screw **52** shown. The shaft **42** is thus free to rotate within the bushing **50**. The shaft **42** is further provided with a handle **54** so that such in turn may be utilized to rotate the clamp **38** as best illustrated in FIGURE 6 of the drawings.

It may also be seen that the post **46** of the driving clamp **38** is in turn mounted upon a slide **56** which is affixed in turn to the plate **14** for pivotal movement therewith by means of a bolt **58**. The slide **56** is thus adapted to move through a short arc represented by the solid and dotted line showing thereof in FIGURE 4 of the drawings. Thus, outward pivoting of the slide **56** away from the opening **24** also carries the driving clamp **38** in an outward direction so as to permit an opening large enough between the leading edges of the clamps **38** and **40** to permit a container C to move therebetween and into position overlying the opening **24** as previously set forth. In such position the slide **56** and accordingly the driving clamp **38** is then inwardly pivoted so as to permit the clamps **38, 40** to firmly grasp the peripheral portion of the container body.

The grasping means above described may be held in position by locking means **60** comprising a keeper bar **62** pivotally mounted on a shaft **64** which is in turn journaled in a post **66**. The keeper bar **62** is in turn provided with a handle member **68** for ease in engaging the inner portion of the keeper bar **62** with the trailing edge **76** of the slide member **56**. The post **66** is in turn affixed to the plate **14**.

Turning now to the cutter means **22** as best shown in FIGURES 1, 3 and 5 of the drawings, such is mounted for vertical reciprocation on the upright axis formed by the container C when in an upright position. The cutter means **22** is provided with a headed member **72** having a plurality of generally spade shaped cutting elements **74** downwardly projecting therefrom. The headed member **72** is shown as being circular to conform to the depicted circular configuration of the container C but it should be brought out that it will of course necessarily conform to the particular shape of the container being opened. The headed member **72** is in turn attached to a toothed rack **76** held within a gib **78** which is in turn supported by a brace **80** attached to an extending portion of the column **16** as best shown in FIGURE 3.

Furthermore, a platform extension of the column **16** supports a motor M or other conventional driving means so as to rotate a worm gear and pinion within the housing **82** so as to actuate the rack **76** for vertical reciprocate motion axially of the container body. This action of the cutter means enables the respective ends of the container to be severed from the body thereof and for the contents thereof to be readily dispensed as will hereinafter be more clearly brought out. The size of the headed member **72** is equal to or slightly less than that of the body of the container C and accordingly is approximately the size of each closure end portion disposed inwardly of the peripheral extent of such container body C. This relationship best can be seen from FIGURES 5 and 7 of the drawings.

The cutting elements **74** are relatively thin in cross-section and accordingly in combination with the headed

member 72 form a hollow downwardly opening space 82 within the cutter means 22. A plurality of pins 84 downwardly terminating in magnetic shoes 86 are mounted within such space. The pins 84 are downwardly biased by means of springs 88 which are held between the shoe 86 and the inner surface of the head 72, and are further free to move upwardly through compression of the springs 88 as by force transmitted thereto by a severed end portion during the cutting and dispensing steps. Thus as best shown in FIGURE 7 of the drawings as the cutter means 22 downwardly progresses through an end of the container and thereafter completely severs such from the container body C; the thus severed end is engaged by and therefore held by the magnetic shoes 86 so that upon withdrawal of the cutter means 22, the end is downwardly biased from the space 82 so as to be readily removable from the cutter means.

The operation of the device is as follows: reference being made to the sequential steps A through G depicted in FIGURE 2 of the drawings. Initially a container C is positioned within the clamps 38, 40 in their open position as shown by dotted lines in FIGURE 4. The clamps are then closed and the positioning grasping means 20 locked in position so that the clamps 38, 40 firmly grasp the body of the container C as shown in FIGURE 2A, the container therein being shown in an initial upright position with closure end E–1 located proximate to but below the cutter means 22. Thereafter the cutter means 22 is actuated downwardly so as to completely sever closure end E–1 from the body of the container and thereafter upwardly; the thus severed end portion being retained within the space 82 by the magnetic shoes 86 as depicted in FIGURE 7 of the drawings. This removal of the first end from the container is thus accomplished by a short stroke reciprocating action of the cutter means as is illustrated by FIGURES 2B and 2C of the drawings.

Thereafter the positioning and grasping means 20 is rotated through an arc of 180° so as to position the thus severed and now opened end of the container above the opening 24 and so as to freely expose the second closure end to the cutter means 22 as depicted in FIGURES 2D and 2E. Thereafter the cutter means 22 is downwardly and continuously actuated whereupon it punctures and completely severs the remaining end E–2 from the body of the container and continues in a downward direction axially of the container body. In such long stroke action of the cutter means, the severed portion of the closure end E–2 is further held within the cutter elements 74 in the space 82 so as to present a plunger-like structure in continuous contact with the contents to be dispensed from the container and particularly in regard to material close to or adherent to the side walls thereof. In this way then, the contents are substantially entirely dispensed from within the container body through the opening 24 and into appropriate receiving means (not shown). Upon the completion of such dispensing as shown in FIGURES 2F and 2G, the cutter means 22 is withdrawn from within the can body as depicted in FIGURE 2H. Thereafter the severed portions of the end closures E–1 and E–2 and others which may have accumulated from previous cycles are removed by known means, the clamps 38, 40 moved to the open position and the container body removed for crushing or other disposition.

From the foregoing it may be seen that both novel means for dispensing the contents of a container and a novel method of dispensing container contents have been set forth; however, attention is directed to the fact that variations may be made in both the structural details of the device and the mode of operation without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. The method of dispensing the contents of a container having a body and closure ends at opposite ends thereof comprising the sequential steps of:

(a) positioning said container in an upright position and freely exposing the first end thereof,

(b) puncturing said first end so as to form a first opening in said container through which the contents thereof may be dispensed,

(c) rotating said container so as to position said first opening adjacent means for receiving the contents of said container, said rotation further positioning said container in an alternate upright position and freely exposing the second end of said container,

(d) puncturing and thereafter completely removing said second end from said body, and

(e) moving said severed second can end axially relative to said body and toward said first opening so as to contact and dispense the container contents from said first opening.

2. The method of dispensing the contents of a container having a body and closure ends at opposite ends thereof comprising the sequential steps of:

(a) firmly grasping said body portion and positioning said container in an upright position so as to freely expose the first end thereof to cutting means, maintaining such grasp on said body and thereafter,

(b) puncturing and completely severing said first end from said body with said cutting means to form a first opening in said container, through which the contents thereof may be dispensed,

(c) rotating said container so as to position said first opening adjacent means for receiving the contents of said container, said rotation further positioning said container in an alternate upright position and freely exposing the second end of said container to said cutting means,

(d) progressively moving said cutting means from a position above said second end towards said first opening so as to initially puncture said second end, further moving said cutting means from said initial puncturing position through the plane of said second end so as to completely sever such from the body and thereafter moving said cutting means and said second can end axially relative to said body and toward said first opening so as to contact and dispense the contents from said first opening and,

(e) withdrawing said cutting means from said body and releasing the grasp thereof.

3. The method of dispensing the contents of a container having a body and closure ends at opposite ends thereof comprising:

(a) positioning said container in an upright position wherein one end of the container is in superposed relation to receiving means for the contents of said container and so as to further freely expose the other end thereof to cutting means positioned thereabove,

(b) grasping said body so as to maintain the axial relationship of said container with both said receiving and cutting means during the following sequential steps of

(c) moving said cutting means from an initial position above said other end completely through the plane of said other end to a point intermediate said body but distal from said one end and then back to a position above said container to puncture and completely sever said other end from said body to form a first opening in said container through which the contents thereof may be dispensed,

(d) rotating said container to an alternate upright position wherein said first opening is in superposed relation with said receiving means and to further freely expose said one end thereof to said cutting means,

(e) moving said cutting means downwardly through the plane of said one end to completely sever said one end from said body and thereafter axially of said body to a position proximate said first opening while maintaining the thus severed portion of said one end in continuous contact with said cutting

means during such downward axial movement of the cutting means relative to said body whereby said severed one end continually contacts said contents thereby substantially completely dispensing the contents of said container therefrom into said receiving means, and

(f) withdrawing said cutting means and said severed one end from said body, and releasing the grasp on said body.

4. The method of claim **3** wherein the container body is of essentially straight-sided configuration, the can ends are essentially of equal size and shape, and the cutting means is of a peripheral extent only slightly less than that of said body whereby the severed portions of said ends are substantially entirely coextensive with the cross-sectional extent of said body when said ends are normally disposed to the upright axis of said body.

5. The method of claim **3** wherein the peripheral edges of said severed end portions remaining on said body are downwardly flattened into intimate contact with said body by the respective downward movements of cutting means.

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HUGO O. SCHULZ, Primary Examiner

U.S. Cl. X.R.

30—6.4, 10; 214—305, 310