April 22, 1969 E. BOK 3,439,468

METHOD OF MANUFACTURING BAG CLOSURES

Filed Nov. 2, 1964 Sheet 1 of 3

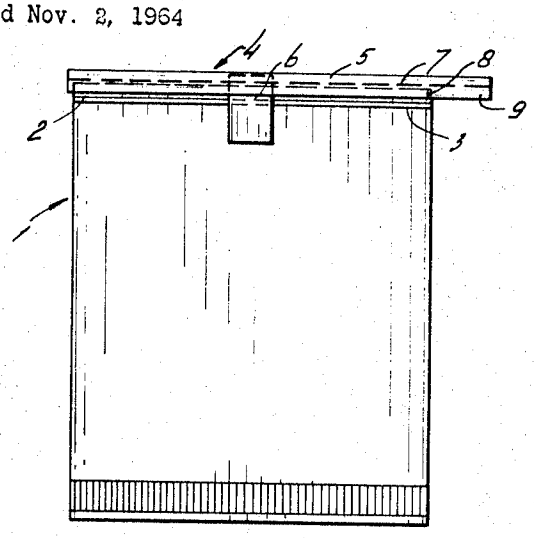


FIG. 1

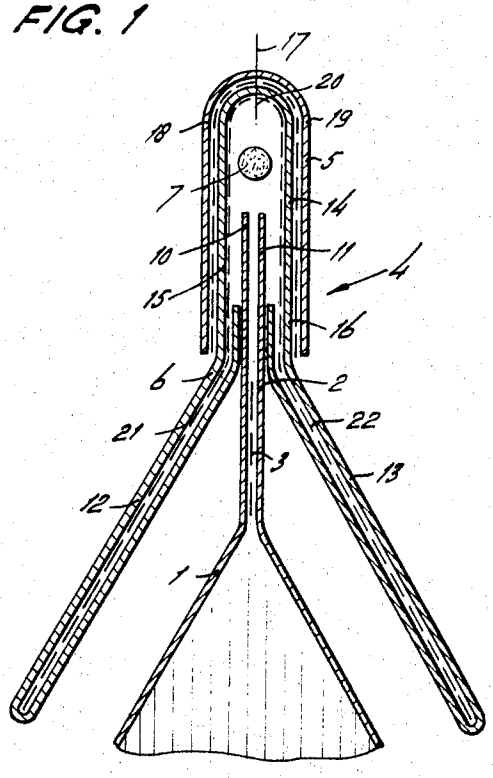


FIG. 2

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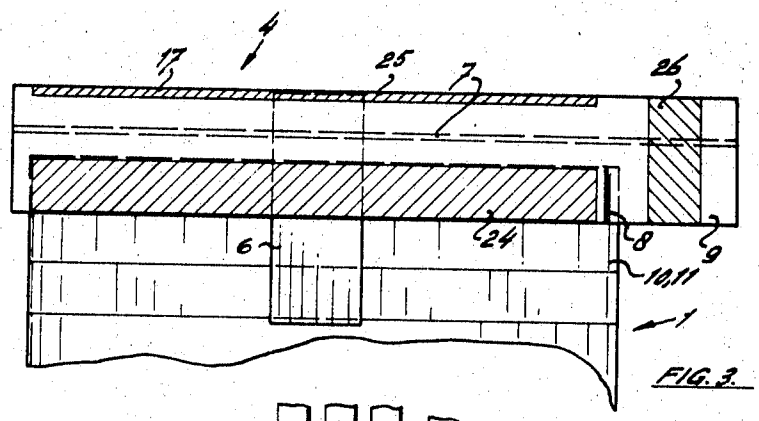


FIG. 3.

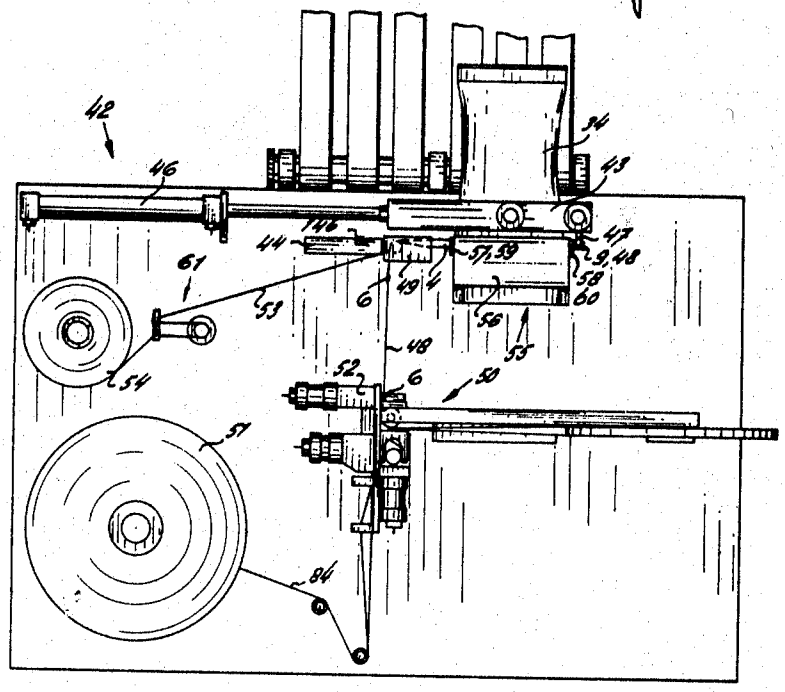


FIG. 8

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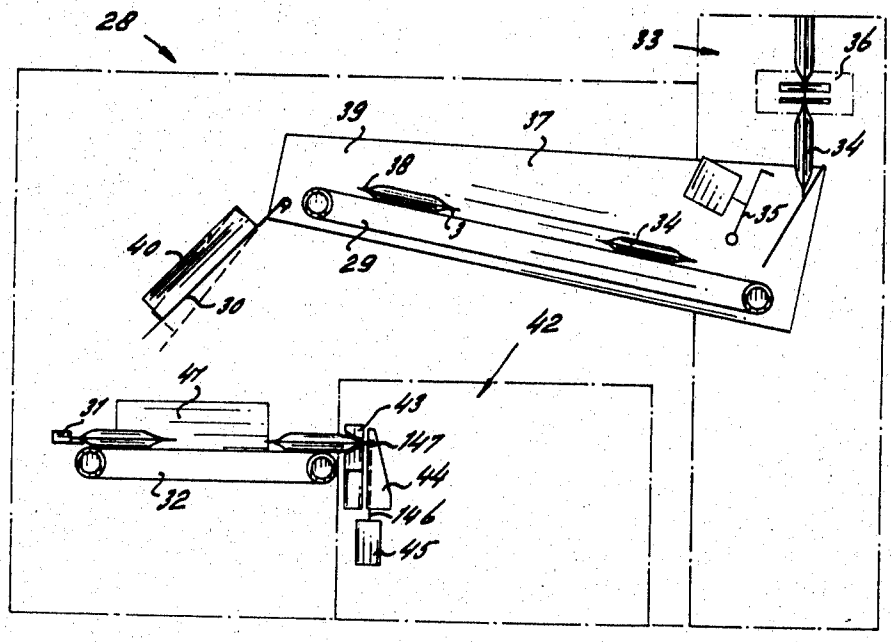


FIG. 7.

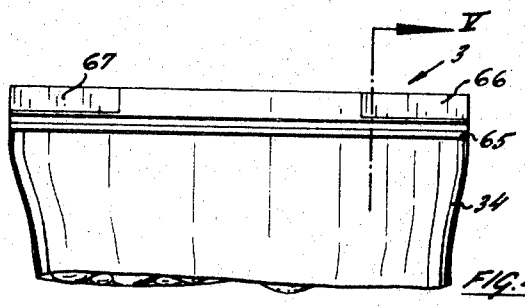


FIG. 4.

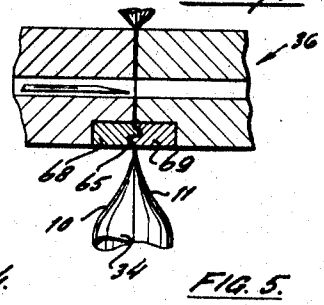


FIG. 5.

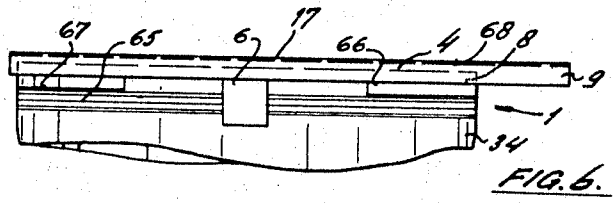


FIG. 6.

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3,439,468

METHOD OF MANUFACTURING BAG CLOSURES

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Int. Cl. B65b 61/18, 9/12, 51/30
U.S. Cl. 53—14
3 Claims

ABSTRACT OF THE DISCLOSURE

The present invention relates to a bag closure and method of manufacture, particularly a method of manufacturing a resealable bag using pressure sensitive adhesive as a resealing means and including tear strip pressure sensitive cutting means and reinforced pull tab opening means.

The invention relates to a closure for a bag having a flat mouth the outer sides whereof are provided with adhering adhesive tape, strips whereof protrude opposite to each other beyond the mouth edge and close the bag by the adhesion of the adhesive layers to each other.

In the practical application of this type of bags there is a desire to have them delivered from the packing factory filled with sweeties provided with a solid air tight closure such that this closure after opening cannot be reshaped to its original state, showing clearly that the bag has been opened. Such type of closure constitutes at the same time the seal of the manufacturer and a means to ensure that the filled bags can be stocked during a long period without any damage that the contents will be attacked by influence of the surrounding atmosphere.

On the other hand it is very desirable that the buyer of the package can open it and reclose it in a satisfactory air tight manner after taking a part from the contents.

It is an object of this invention to meet these desires by means of a closure comprising adhesive tape and to bring a solution which is not too expensive in manufacturing on automatic machines designed in correspondence with the features of the new closure.

Further objects in the working out of the invention are to make the means for opening and closing the bag practical for the user, trustworthy and at the same time ready for manufacture in the automatic machine, wherein the whole of the closure is made and that as a part added to the filling machine for the bag and working with the same capacity and without necessity for additional operator handling.

A still further object of the invention is to develop means for opening the original outer closure destined for maintenance during stocking periods, by which the opening can be executed quite sure without damaging the neat appearance of the remaining closure parts during the application thereof by the buyer.

These and further objects in mind and the manner in which they are obtained according to the invention and developments thereof will be described now hereinafter with reference to the drawing and the most essential features thereof will be defined in claims.

In the drawing:

FIGURE 1 is a side view of a filled and sealed bag according to the invention,

FIGURE 2 on a larger scale a detail cross section along the line II—II of FIGURE 1,

FIGURE 3 on a somewhat reduced scale with respect to FIGURE 2 a schematic side view of the upper part of a bag, wherein those parts of the adhesive sealing tape

where extra pressure is applied in the sealing process are specially outlined,

FIGURE 4 is a side view corresponding to FIGURE 3, but on a smaller scale showing the bag in a preliminary stage of manufacture of the closure, before sealing tape has been applied,

FIGURE 5 a cross sectional detail along the line V in FIGURE 4 but on a larger scale, showing at the same time schematically machine parts used in this stage of manufacturing,

FIGURE 6 a view corresponding to FIGURE 4, but after application of sealing tape,

FIGURE 7 a schematic side view of a transport mechanism for the bags from a filling machine to the sealing machine,

FIGURE 8 a schematic top view on a device by which the adhesive tape closure is applied to the bags.

In the embodiment of FIGURE 1 the first closure consists in a weak heat seal **3** of small width which is applied to the end **2** of the filled bag **1**, where the walls of the bag are brought flat against each other. The second and third closure are indicated as a whole by **4**. Two strips **18** and **19** of one adhesive tape length **5** are folded one on each side of the bag mouth **2** on the outer side of the walls thereof and they adhere thereto by single pressing them thereon in the area indicated by **24** in FIGURE 3. This cannot be seen in FIGURE 2, because the cross section is taken along the middle of the pull lips strip **6**. A tear wire **7** is embedded in the adhesive layers of the sealing strips **18**, **19** at their parts protruding beyond the edge of the bag mouth **2**, where the adhesive layers thereof adhere to each other and shape the second closure (see also FIGURE 3).

The tear string **7** extends at the side of the bag, where it is enclosed by the tape part **9**, which is provided with a small notch **8** on each side in order to facilitate tearing open the bag for the first time without damaging the adhesive tape seal.

In FIGURES 2 and 3 it can clearly be seen that the third, solid closure is formed at **17** by a fold line of the strips **18**, **19** of the adhesive tape length, which is applied from a tape roll through a folding device as will be shown hereinafter. It is this fold **17** which is torn open by the tear string **7**. According to FIGURE 2 the pull lips **12** and **13** are parts of one single adhesive tape length **18**, folded at **20** within the fold **17**, and the ends of these lips are folded inwardly and thus the pull parts **12** and **13** are double walled and strong the two walls adhering to each other by their adhesive layer in the planes indicated by **21** and **22**. The parts **15** and **16** of this adhesive surface adhere at **10** and **11** to the respective sides **10** and **11** of the bag, and the parts of the pull tape sides **15** and **16** protruding beyond the mouth edge ensure the bag sealing in the same manner as the strips **18** and **19** of the sealing tape **5** running along the length of the mouth edge (second closure). The strips **18**, **19** adhere at the same time to the outer sides of the pull tape parts **15** and **16** so that the connection of the pull lips to the bag is strengthened thereby. A normal polyethylene adhesive tape can be used as well for the pull lip strip as for the sealing strip tape and after the solid (third) closure **17**, **20** has been ripped open by means of the tear string **7** the adhesive layer closure (second closure) will still shape an airtight seal which however can be opened by means of the pull lips **12** and **13**.

It will be clear that on cutting the fold **17** by means of the wire **7** the fold **20** of the pull tape **6** is at the same time cut and strip parts **18** and **19** are separated thereby at their top so that on pulling these lips outwardly in opposite directions, the bag mouth walls **10** and **11** are

removed from each other, then the weak heat seal **3** is broken along its length, starting in the middle thereof and further on the adhesive seal is broken in the zone above the area **24** in FIGURE 3, starting in the middle part thereof and proceeeding to both sides.

After a part of the contents of the bag **1** is taken therefrom it can easily be reclosed airtight by means of the above mentioned adhesive zone beyond the mouth edge by taking the mouth of the bag between the two fingers of one hand at the left hand side of the line II—II in FIGURE 1 and with two fingers of the other hand on the right hand side of this line and then moving the hands away from each other along the outer sides of the sealing tape strips **18, 19** to the side edges of the bag.

In FIGURE 3 a zone **25** is shown shaded in the direct proximity of the fold line where the adhesive tape strips **18** and **19** are pressed with extra force onto each other in order to obtain a sharp crease, which can easily be cut by wire **7**. The device by which this is obtained in the manufacture of the closure will be described further on.

The non-shaded surfaces of the adhesive tape closure are only lightly pressed onto each other, in the manufacturing process, so that an easy moving of the tear string **7** by the user between the sides of the adhesive tape is made possible.

In FIGURE 4 and in the cross section of FIGURE 5 a filled bag **34** is shown, provided with a weak or non completed closure (first closure) **65** being the stage of manufacture wherein it leaves the heat sealing and cutting unit **36** (FIG. 7) of the filling machine **33**. It is quite normal in such a machine, that such a unit at the outlet side of a filling machine provides a heat seal across a tube, above the lower part of the tube which has been filled and shaping at the same time the bottom of the next part of the tube to be filled, whereupon the filled bag **34** is cut off by cutting the sealed area in two parts as schematically shown in FIGS. 5 and 7 at **36**.

In the present case however heating parts of the lower pair of sealing jaws are limited to two areas providing a heat seal only at the surfaces **67** (FIG. 4) on the sides of the bag mouth and/or eventually a weak heat seal of small width in the zone indicated by **3** in FIGURE 1.

In the present embodiment however the weak seal **3** is not a heat seal but by means of two inserted heat insulated lower jaw parts **68, 69** a profile **65** is provided in the walls of the flat bag mouth. In this way a weak closure **65** (first closure) is shaped as well which is protected at the sides of the mouth by the solid heat seal parts **66** and **67** and in this way it is obtained that the bag can be transported upside down to the apparatus where the second and third closure parts are provided, without danger that the articles filled into the bag will pass the mouth. This first, protective closure continues its same protective purpose in the closure when completed and when the filled bag is in use by the buyer after opening of the outer, solid closure by means of the tear wire **7**.

FIGURE 6 showing the closure completed will easily be understood after the explanation given hereabove already with respect to FIGS. 1 and 2. The notches **8** in the tape **9** (one in view) are positioned in this embodiment just inside the side border of the bag **34** and further a perforation **68** is provided somewhat to the left above the notch **8** in the fold line **17** of the sealing tape **9**. It has been found that this is the most sure way to rip the sealing tape between the notches **8** and the perforation **68** when the tape end **9** with the tear string **7** enclosed therein is pulled upward for cutting the fold **17** avoiding any danger that the sealing type would be pulled from the bag walls.

In FIGURE 7 it can further be seen that the filled and cut off bag **34** is transported to the closure manufacturing device **42** by a transport device **28**.

The bags **34** attained from the bag forming and filling machine **33** are temporarily held by means of a clamping device **35** against a slide until the jaws **36** of the machine **33** after finishing their sealing action move upward again in order to pull a following tube length downward. The moment of opening the clamping device **35** is timed with the start of the said upward movement so that a uniform discharge of the bags to the transport device **39** is assured.

When the bag **34** is released by the clamping device **35** it lands in the guide trough **37** through which it is transported by the conveyor belt **29** to a slide trough **30, 40**, which is mounted with an adjustable inclinement to the trough **37** and is made of such thin elastic material, that it can deflect under the weight of the filled bag **34** so that the latter lands with its end **38** against the stop block **31** upon the conveyor belt **32** in the trough **41**.

If empty bags arrive on the slide **30** because of any default in the filling machine the slide trough **30** practically does not deflect and these empty bags are delivered behind the stop block **31** and thus do not arrive on the conveyor **32**.

It will be clear that the filled bags **34** arrive at the closure machine table **42** with their permanently closed bottom end **38** turned away from this device but with the end bearing only the preliminary weak closure part (first closure) turned to the device **43** on the table **42** whereat the bag mouth lands against a stop block **34**. On the way from the filling machine **33** to the closure table **42** the direction of movement of the bags **34** has been reversed for this purpose in the manner as described hereabove.

A sensitive electric switch is built into the stop block **44**, which works as soon as the end of the filled bag **34** causes the upper end of a stop pin **146** to move, which happens just before the forward end of the bag **34** lands against the stop surface **147** of the block **44**.

The switch **45** then sends an electric impulse to an impulse sender on the closure table **42**, by which the applying of the adhesive tape closure to the filled bag is initiated in a way to be described further on.

Now the device **42** for applying the adhesive tape closure **4** to filled bags **34**, mentioned already hereabove as the closure manufacturing table **42**, will be described with reference to FIGURE 8.

The bag grip **43** is moved laterally by means of an air cylinder **146** during the applying of the adhesive tape closure **4** to the bag **34**. A separate set of grip jaws **43** is provided on the bag grip **43**, gripping the outer end **9** of the adhesive tapelength and taking it along with the bag and at the same time the tape **48** is folded about the mouth edge of the bag **34** and provisionally brought to adherence therewith by means of the folding device **49**. This sealing tape **48** is supplied from a roller. In FIGURE 8 the supply track is shown just below the device, indicated by the reference number **50** at the right hand side of this figure.

By means of the device **50** pull lip material, to be as well adhesive tape, is pulled from a roller **51**, strips **6** are cut off, folded at their outer ends and attached crosswise to the adhesive tape **48** in an apply station **52** at distances from each other corresponding to the successive sealing lengths of the sealing tape **48** to be applied to the bags.

At the same time tear string material **53** is taken along from a roller **54** with the movement of the bag grip **43** and pinched between the tape **48** in the folding device **49** for the latter.

It is to be understood, that in FIGURE 8 the bag **34** is shown in a position just before it is carried away by the right hand group of three bands of a conveyor moving it outward from the table **42** to a delivery station after the closure has been completed. Therefore the plunger of cylinder **46** takes its fully shoven out position. The bag **34** had been transported onward to the table **42** in a foregoing phase on the left hand group of the bands belonging to a conveyor moving in opposite direction to the first-mentioned conveyor. In that stage the abovemen-

tioned plunger took its inward position and the grip device **43** was situated opposite the end of the lastmentioned conveyor.

When now by filling one end of the air cylinder **46** with air under pressure the grip **43** is moved to the right the bag will thereby be carried in a sideward direction and the sealing tape **48** as well as the wire **53** are pulled along through the folding device **49** (FIG. 8) and the cross-sectional part of the sealing tape near its fold with the tear wire **53** enclosed therein will be attached to the outer edge of the bag mouth.

What I claim is:

1. A method for providing a filled flat-mouthed bag from advancing tube stock with a combined first heat seal closure; a second reclosable sealing tape closure and a third solid tearable closure comprising:

(A) heat sealing said tube at opposed edges thereof to provide a first rudimentary heat seal closure to the mouth of a filled bag;

(B) simultaneously and adjacently heat sealing transversely across said tube so as to form a heat sealed bottom of the next bag to be filled;

(C) cutting said tube transversely intermediate heat sealings, so as to define a bag mouth;

(D) closing a median portion of said bag mouth with a strip of pressure sensitive adhesive as an opening tab extending from one lip, over the bag mouth and onto the opposed lip so that opposed portions of pressure sensitive adhesive extend inwardly towards each other above said bag mouth;

(E) forming a second reclosable sealing tape closure by applying a folded strip of pressure sensitive adhesive over both top edges of the bag mouth so

that the opposed edges of said pressure sensitive adhesive strip extend over said opening tab and onto the mouth edges for adherence thereto, while the closed end of said folded strip presents opposed surfaces of pressure sensitive adhesive above said bag mouth.

2. Method as in claim **1**, including the step of inserting a tape-tearing means across the mouth of said bag and beneath both said opening tab and said reclosable sealing tape closure, said tape tearing means being capable of cutting through the closed ends of opening tab and the folded pressure sensitive adhesive forming said second reclosable sealing tape closure.

3. Method as in claim **1**, including cutting said reclosable sealing tape closure at its lower open ends adjacent one edge of said bag so as to provide a notch for opening said closure by said tape-tearing means.

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U.S. Cl. X.R.

53—133, 180; 229—66