

[54] **LINEAR STRIP OF SEVERABLE BAGS**

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[51] Int. Cl. **B65d 33/00**

[58] Field of Search **229/53, 69, 66; 206/57 A; 53/385, 29**

[56] **References Cited**

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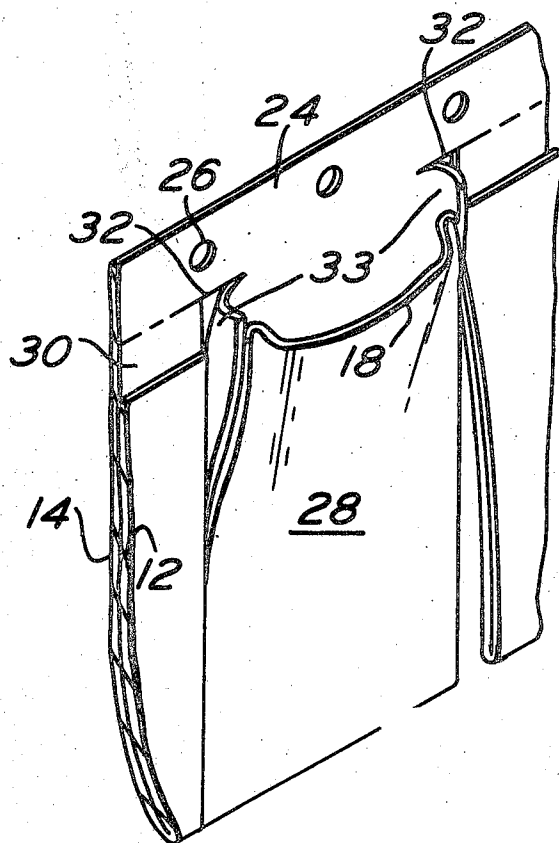
Primary Examiner—Herbert F. Ross

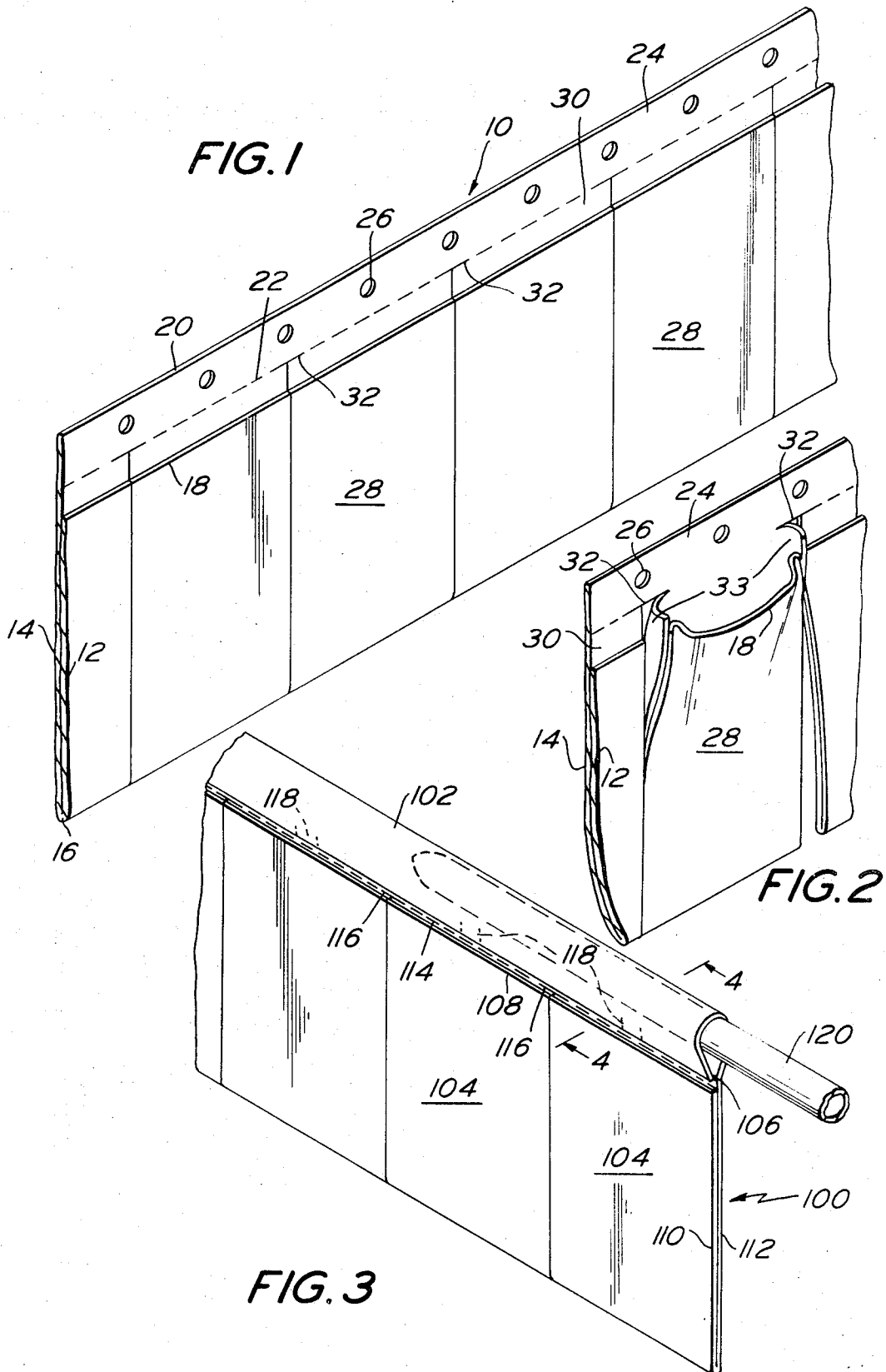
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[57] **ABSTRACT**

A flexible bag or series of flexible bags connected in a strip, each bag having a selvage portion, this selvage portion being common to all the bags when in said strip. The bag or bags are connected to the selvage portion by a perforated line, there being an elongated slit in the perforated line adjacent the side edges of the bag. The bag or bags are each provided with an open mouth defined by an upwardly extending portion of the rear wall thereof, this upwardly extending portion forming a lip. Each lip is connected to the selvage portion by means of the perforated line. When a bag is pulled laterally forward, the slits permit a portion of the rear wall to move into a transverse position forming side walls for the open mouth. The selvage portion may be flat or tubular. When it is tubular, it is adapted to receive a supporting mandrel and is also optionally provided with apertures corresponding to optionally provided apertures in the mandrel, whereby pulses of gaseous or liquid fluid may be passed into the mouth of each bag to aid in opening the bag.

8 Claims, 7 Drawing Figures





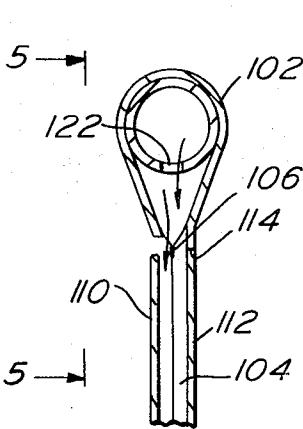


FIG. 4

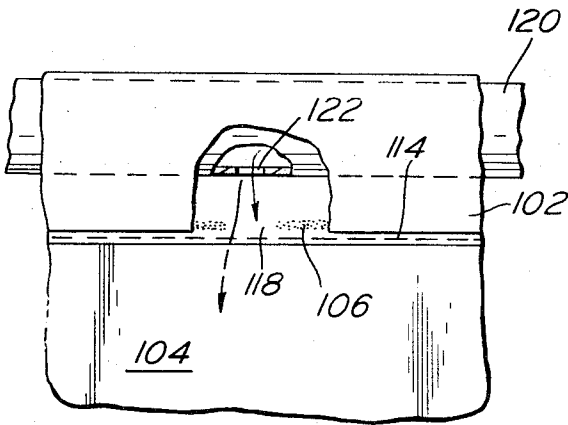


FIG. 5

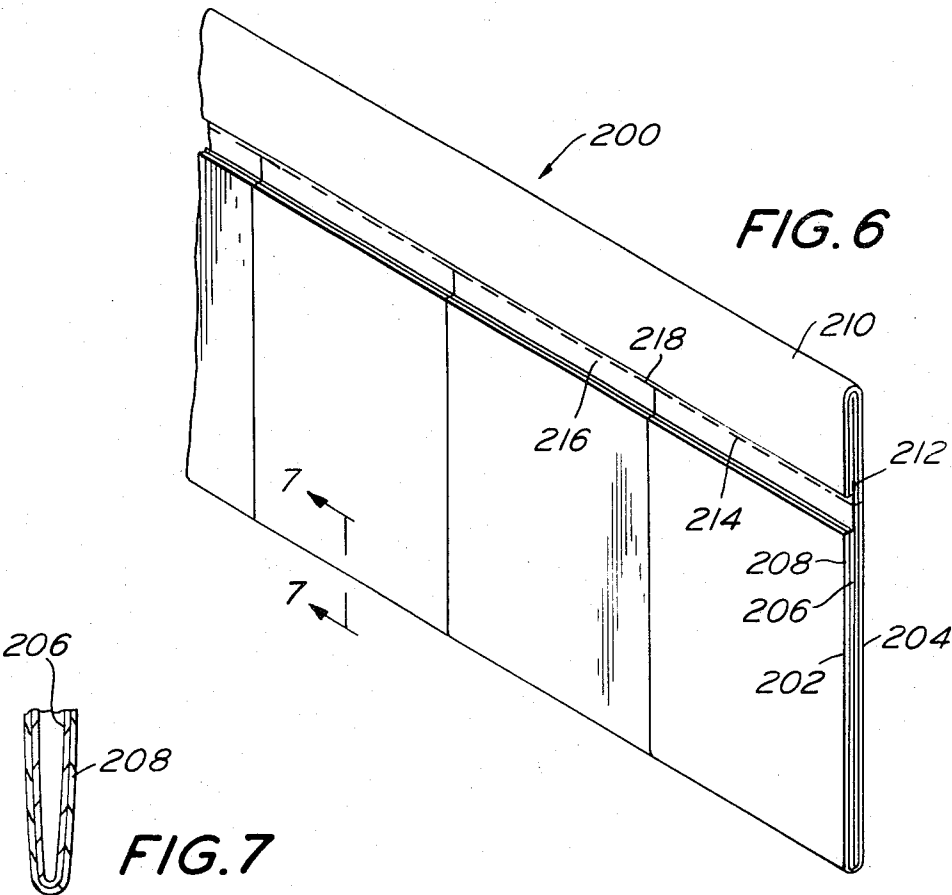


FIG. 6

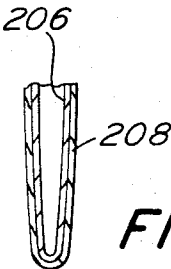


FIG. 7

LINEAR STRIP OF SEVERABLE BAGS

This is a continuation-in-part of application Ser. No. 178,908, filed Sept. 9, 1971.

This invention relates to bags constructed of thermoplastic or partially thermoplastic material, and it particularly relates to bags of the aforesaid type which are manufactured and then filled and sealed while connected in a linear strip.

Thermoplastic bags have heretofore been made, filled and sealed while connected in strips. However, there has always been a certain amount of difficulty not only in holding these bags together in the strip while yet making them easily separable, but also in filling and sealing these bags.

It is, therefore, one object of the present invention to provide a strip of thermoplastic or partly thermoplastic bags which are firmly held together while being filled and sealed, which are easily opened to receive the filling material while held in the strip, and which are yet easily separated after being filled and sealed.

Another object of the present invention is to provide a strip of bags of the aforesaid type which are adapted to be simply and economically produced and which are capable of being filled and sealed in a rapid and efficient manner without any special skill on the part of the operator.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following description when read in conjunction with the accompanying drawings wherein:

FIG. 1 is a front perspective view of a portion of a strip of bags embodying the present invention.

FIG. 2 is a fragmentary front perspective view of the strip of FIG. 1, illustrating a partially detached bag, said bag being shown opened prior to filling.

FIG. 3 is a front perspective view of a portion of a strip of bags embodying an alternative form of the present invention.

FIG. 4 is a cross sectional view taken on line 4—4 of FIG. 3.

FIG. 5 is a front elevational view, partly broken away, taken on line 5—5 of FIG. 4.

FIG. 6 is a front perspective view of a portion of a linear strip of bags embodying a third form of the invention.

FIG. 7 is a fragmentary cross-sectional view taken on line 7—7 of FIG. 6.

Referring now in greater detail to the various figures of the drawings wherein similar reference characters refer to similar parts, there is shown in FIG. 1 a strip of bags, generally designated 10, comprising a sheet of polyethylene which has been overfolded to provide front and rear walls, respectively designated as 12 and 14, defined by a closed bottom edge 16 and open edges 18 and 20 on top. The edge 18 is substantially lower than the edge 20 and is also lower than the perforated line 22.

The linear strip 24 defined between the edge 20 and the perforated line 22 is a tear-away or selva strip which is shown as being provided with holes or apertures 26. These holes 26 are optionally provided for the purpose of being engaged by pins mounted on a moving belt, fingers, ratchet teeth, or the like, for conveying the strip of bags in a linear direction past the filling station where the bags are individually filled with whatever contents are to be packaged therein and then

sealed shut. Instead of holes, cross-slits or any other desired openings may be provided for the same purpose. The selva strip 24, itself, serves as a connecting means between the individual bags which may be individually removed from this selva strip by tearing along the perforated line 22.

The individual bags, designated 28, are formed from the overfolded sheet of thermoplastic material by contacting the overfolded sheet with a transversely extending heated wire, or knife, or similar heated instrument, which acts to both sever the bags from each other and to seal the severed edges. This method of manufacture is now well-known and, by itself, forms no part of the present invention.

As noted above, the perforated line 22 is positioned above the edge 18, so that when a bag is removed by tearing along the perforated line, an upwardly extending lip 30 is formed as an extension of the rear wall 14. This lip aids in grasping and handling the bag, and aids in opening the mouth of the bag manually. In this respect, when the lips forming the mouth of the bag are in the same plane, it is difficult to grasp them so that they can be pulled apart against the clinging action of the thermoplastic material. However, when the extended lip is provided, this can be easily grasped for pulling the mouth open.

It is also to be noted that a series of somewhat elongated slits 32 are provided in the perforated line 22, each slit 32 bridging a line of seal and severance between adjacent bags. These slits 32 aid in forming a wide open mouth for each bag since when the front wall 12 of the bag is pulled away from the rear wall 14, the slits 32 permit the adjacent portion of the rear wall 14 to pivot into a perpendicular direction, thereby forming side walls 33 at opposite ends to define what is, in effect, a square mouth opening.

In FIGS. 3, 4 and 5 there is shown a modified form of the invention wherein the strip of bags, generally designated 100, is constructed from tubular material. A tubular sleeve 102 at the upper portion of the strip 100 is defined by a horizontal line of seal 106. The upper edge 108 of the front wall 110 of each bag 104 is entirely separated from the rear wall 112 and from the tubular sleeve 102, whereas the rear wall 112 is connected to the sleeve 102 by a perforated line 114. In this manner, the bags are provided with open mouths but are, nevertheless, separably attached to the sleeve 102 which serves as a selva or connecting strip as well as for a purpose to be hereinafter explained. Bridging slits 116, similar to slits 32, are here also optionally provided for the same purpose. Furthermore, although the perforated line 114 is here shown as substantially in the same plane as the upper edges 108 of the front walls of the bags, the edges 108 may be cut lower, if desired, to provide a lip portion at the upper edge of the rear wall 112, similarly to that shown at 30 in FIG. 1. Extending transversely through the line of seal 106 are a series of open passages 118 leading into the interior of the sleeve 102.

The sleeve 102 is adapted to receive a tubular rod or mandrel 120. This mandrel 120 serves as a support for the strip of bags which hang from the mandrel as they are moved toward the filling station. The mandrel is operatively connected, at one end, to a source of gaseous fluid under pressure. This gaseous fluid is either blown in a steady stream through the mandrel or, which is sometimes preferable, in pulses or short bursts. As this

gas flows through the mandrel 120, it passes through transverse openings 122 therein and then through the passages 118 into the open mouths of the bags, where the gas acts to open these mouths for filling. One passage 118 and opening 122 is illustrated for each bag 104. However, two or more such passages and openings may be provided for each bag, as desired.

The gas which is passed through the mandrel 120 may be air, but it may also be one of a number of other gases such as nitrogen, which may be used to provide a preservative or inert atmosphere for such contents as food or the like. Other gases may also be utilized for their own additional properties, such as oxygen, carbon dioxide, water vapor, etc. Of course, the temperature of the gas or vapor should not, ordinarily, be so high as to cause melting or sealing of the thermoplastic material. In addition, the fluid may be liquid instead of gaseous, whereby the liquid itself not only acts to open the bag mouth but also forms the contents to be packaged.

Although the form of the invention shown in FIGS. 3, 4 and 5 is illustrated as utilizing tubular stock, and although such tubular stock is preferable for this form of the invention, it is possible to make it of overfolded sheet stock, in which case, the front wall is folded so as to stop short of the upper edge of the rear wall, and the upper marginal portion of the rear wall is then overfolded and sealed to form the tubular sleeve. This type of flat sheet stock construction is illustrated in FIGS. 6 and 7 described hereinafter.

The invention has so far been described with relation to stock constructed of wholly thermoplastic material; however, the strips of bags shown in FIGS. 1-5 may also be constructed of laminated material wherein the inner ply or layer is thermoplastic while one or more outer plies or layers are constructed of other flexible material such as paper, fabric, or the like. The outer plies may also be either thermoplastic or thermosetting resins. In any event, the outer plies enhance the strength of the bags while the inner thermoplastic ply is adapted to form the necessary heat seals.

FIGS. 6 and 7 illustrate a double ply form of the invention whereby the strip 200 is constructed of a front wall 202 and a rear wall 204. The walls 202 and 204 are integral overfolded portions of flat sheet stock which comprises an inner thermoplastic ply or layer 206 and an outer ply or layer 208 made of paper. The strip 200 is similar to that described in FIGS. 3, 4 and 5 in that it has a sleeve portion 210 which is spaced from the upper edge of the front wall 202. As indicated above, this type of strip may be constructed from sheet stock (in this instance, it is laminated stock, although it may be single ply thermoplastic) wherein the rear wall extends beyond the front wall and is overfolded and sealed, as at 212, to form the sleeve 210.

A perforated line 214 is provided to enable tearing away of the bags, leaving an extended lip 216. Slits 218, similar to slits 116, are also provided.

Although not shown, since it is an optional feature both in this form and in that illustrated in FIGS. 3, 4 and 5, transverse passages, similar to the passages 118, may also be provided to coact with apertures, such as shown at 122, in the mandrel, for the purpose of providing pulses of fluid to open the bag mouths. If such passages are not provided, then the mandrel may be made imperforate to serve only as a support.

The invention claimed is:

1. A linear strip of bags constructed at least partially of thermoplastic material, said bags being arranged side-by-side and being commonly connected by means of a common perforated line to a linearly extending connecting strip, said connecting strip constituting a common selvage portion, each bag comprising a front wall and a rear wall sealed to each other at their corresponding side edges and bottom edges, the top edges being unsealed to form an open mouth, the upper portion of the rear wall of each bag extending beyond the corresponding upper edge of the front wall at said open mouth to form an extended lip, said lip being connected to said selvage portion by said common perforated line, said common perforated line having a plurality of elongated slits collinear therewith, each of said plurality of slits bridging the adjacent side edges of an adjacent pair of bags said bags being unconnected to one another between said common perforated line and said bottom edges.

2. The strip of bags as defined in claim 1 wherein said selvage portion is a tubular sleeve adapted to slidably receive a mandrel from which the strip of bags may hang.

3. The strip of bags as defined in claim 2 wherein a series of linearly spaced, transverse, open passages are provided in said sleeve, said passages extending from within said tubular sleeve toward the mouths of the corresponding bags, there being at least one passage in alignment with each of said bags.

4. The strip of bags as defined in claim 2 wherein said strip of bags is formed from tubular stock.

5. The strip of bags as defined in claim 2 wherein said strip of bags is formed from flat sheet stock which is overfolded to form the bag portion and the sleeve portion.

6. The strip of bags as defined in claim 1 wherein said selvage portion is a flat strip having a series of spaced, transverse apertures adapted to receive engaging means for moving said strip of bags in a linear direction.

7. The strip of bags as defined in claim 1 wherein said strip of bags is formed entirely of thermoplastic material.

8. The strip of bags as defined in claim 1 wherein said strip of bags is of a laminated construction wherein at least the inner layer is formed of thermoplastic material.

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