

[54] BAG WITH DRAW BAND SEPARABLY
INTEGRAL WITH BAG BODY

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229/66

[51] Int. Cl. **B65d 33/16**

[58] Field of Search 150/11; 229/51 T,
229/51 S, 62, 63, 66

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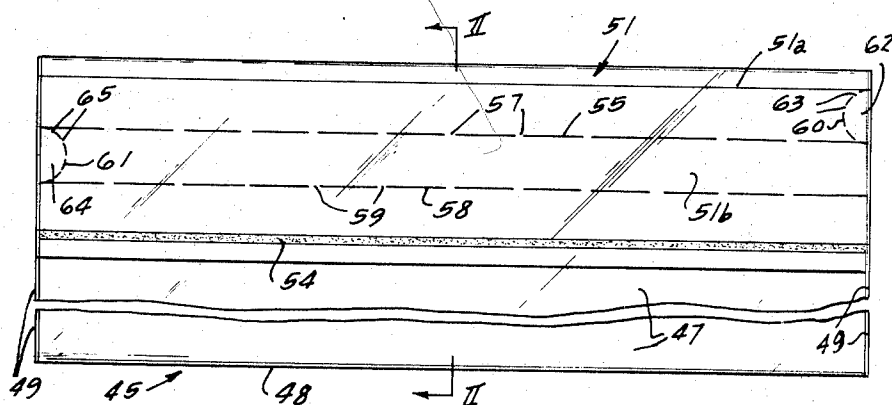
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[57]

ABSTRACT

A draw band closure bag constructed from pliable sheet material has about its mouth a flat, folded, tubular lip tunnel with a flat draw band therein comprising partially separated material of the body of the bag enclosed within the tunnel and separable from the bag body by pulling the band from the tunnel while puckering the material of the tunnel into mouth-closing relation on that portion of the draw band which remains in the puckered area.

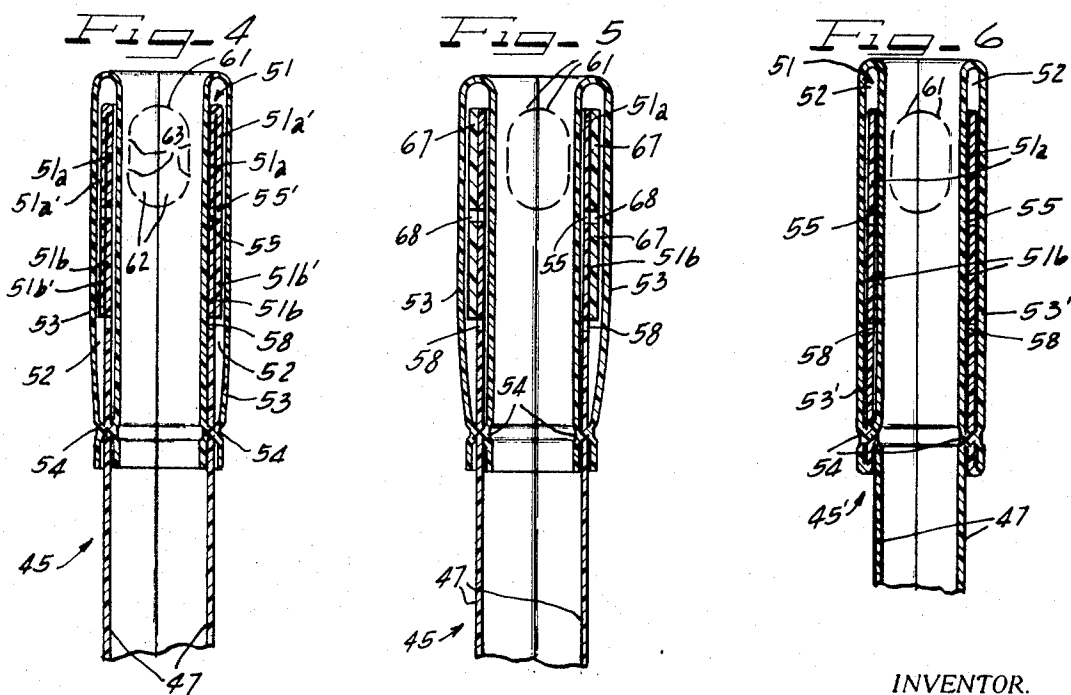
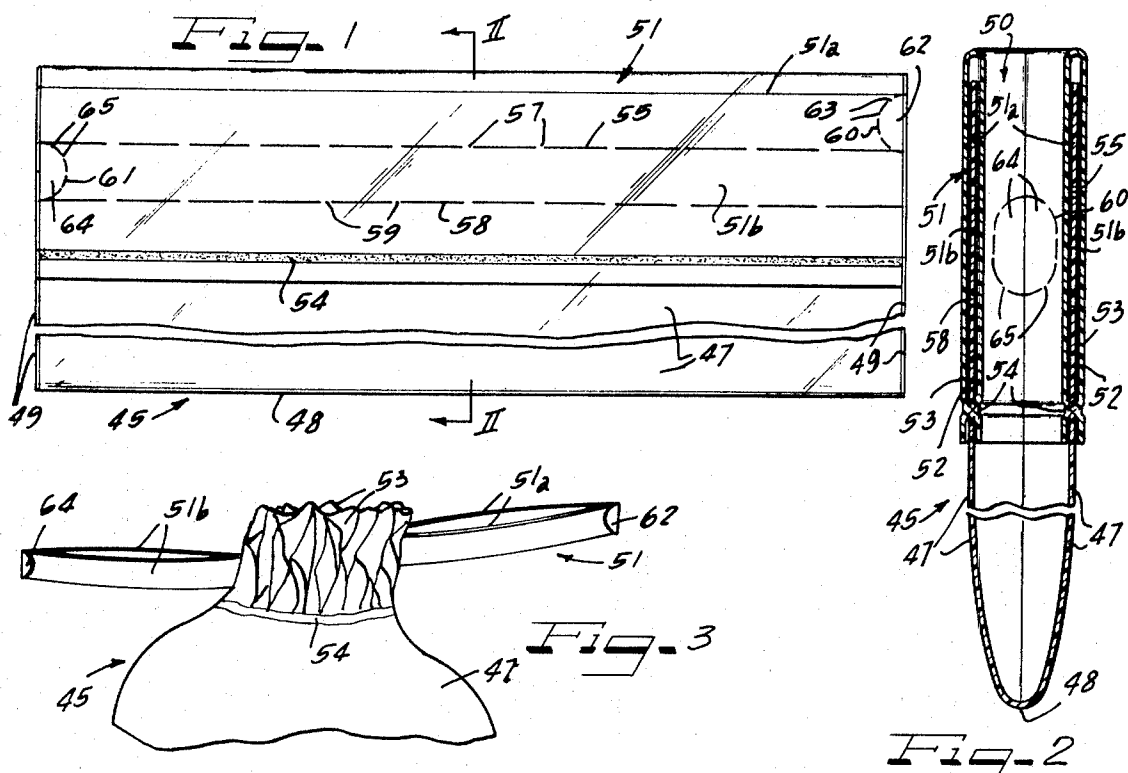
16 Claims, 11 Drawing Figures



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2 Sheets-Sheet 1



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Fig-7

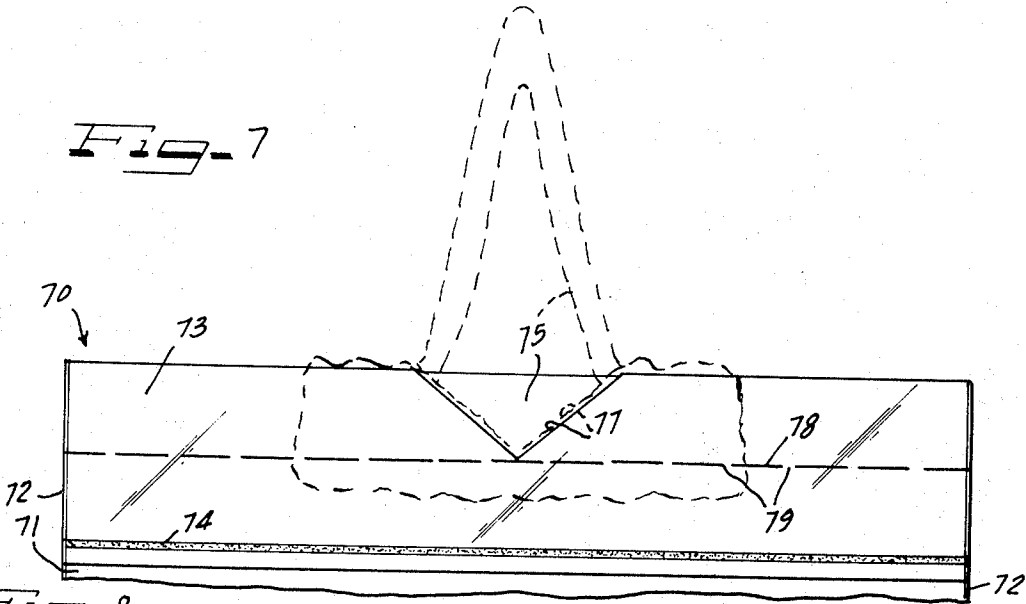


Fig-8

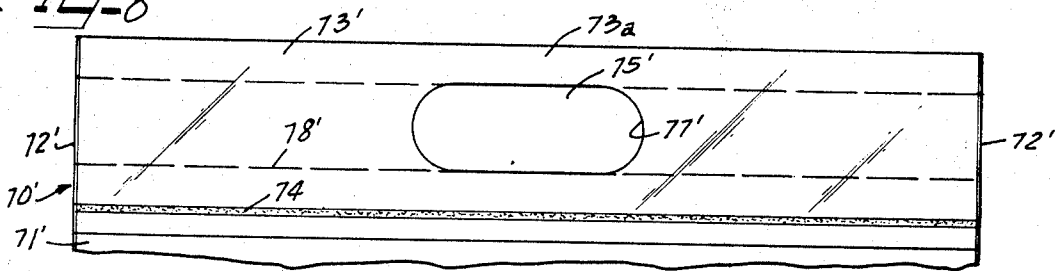


Fig-10

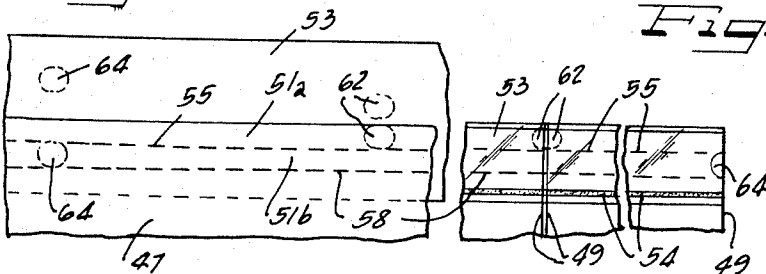


Fig-9

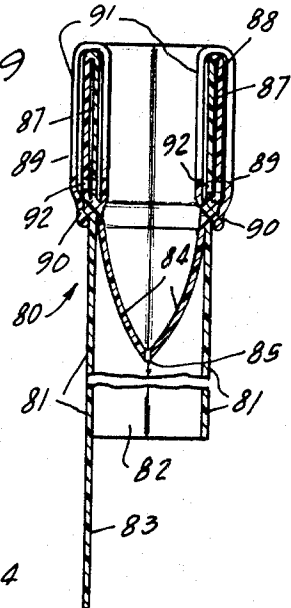
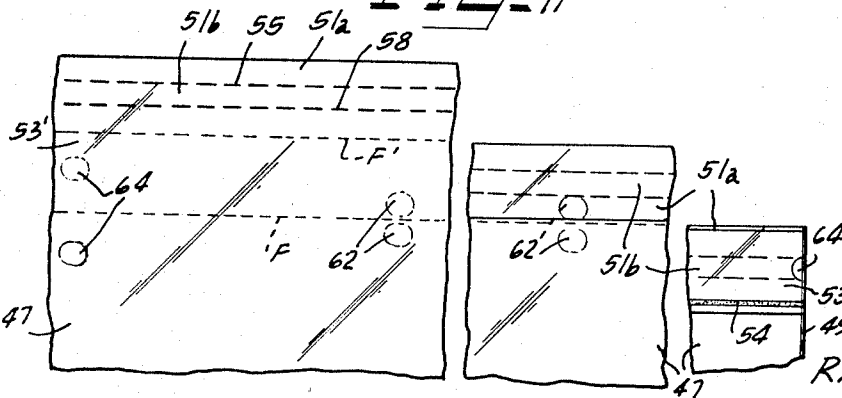


Fig-11



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BAG WITH DRAW BAND SEPARABLY INTEGRAL WITH BAG BODY

This invention relates to novel draw band closure bags, and is particularly concerned with such bags made entirely from sheet material.

Draw strings have generally required time-consuming threading or lacing of cords through loops or grommet eyes, stapling, and the like after the bags have been otherwise completed. These are costly and generally prohibitively expensive procedures, especially when low-cost throw-away bags are involved, such as may be supplied with consumer products in retail markets, and particularly impractical for bags made from material having the pliability and heat-sealing qualities of plastic sheet material of the film type. Customarily the draw strings have been made of different kinds of material from the material of the bags, and generally of a cord structure. Such draw strings cannot be incorporated with the bags during continuous process manufacture from thermoplastic material employing the usual techniques of heat-sealing (including, but not limited to, heated reciprocating die or roller sealing, so-called electric welding, hot wire or wheel cut-off and sealing). Non-plastic material will not respond to and will interfere with heat-sealing.

Another disadvantage of equipping bags of the type normally packed and shipped to the user in collapsed condition with cord-type draw strings is that the draw strings interfere with compact building when packaging for storing and shipping.

According to the present invention, the foregoing and other disadvantages, short-comings, inefficiencies and problems are overcome by providing a new and improved, economical draw band closure bag wherein both the bag and the draw band are of sheet material.

Another object of the invention is to provide a new and improved draw band closure bag made from pliable sheet material and having a flat draw band comprising the flexible sheet material of the bag body.

A further object of the invention is to provide a new draw band closure bag in which all of the materials of the bag, of the draw band and associated structure are thermoplastic and adapted to respond with equal efficiency to heat-sealing techniques.

Still another object of the invention is to provide new and improved draw band closure bags adapted to be produced with utmost economy utilizing high speed continuous mass production apparatus.

A still further object of the invention is to provide a new and improved draw band closure bags in which the material of the bag body provides the draw band.

Yet another object of the invention is to provide a new and improved draw band closure bag which is flat in collapsed condition and enables compact bundling for storage and shipment.

Other objects, features and advantages of the present invention will be readily apparent from the following description of certain preferred embodiments thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure, and in which:

FIG. 1 is a fragmental side elevational view of a draw band closure bag embodying features of the invention;

FIG. 2 is an enlarged fragmental vertical sectional detail view taken substantially along the line II—II of FIG.

1, and for illustrative purposes showing the walls of the bags spread apart from the normal flat condition;

FIG. 3 is a fragmentary side elevational view of the top portion of the bag showing it after the draw bands have been worked to draw the area about the mouth of the bag into puckered mouth-closing relation;

FIGS. 4, 5 and 6, are vertical sectional views similar to FIG. 2, but showing respective modifications;

FIG. 7 is a fragmentary side elevational view of the top portion of a draw band bag showing still another modification;

FIG. 8 is a fragmentary side elevational view of the upper end portion of a bag according to the invention showing still another modification;

FIG. 9 is a fragmental vertical sectional view similar to FIG. 2 but showing a yet further modification;

FIG. 10 is a fragmental schematic plan view illustrating steps in a method of making draw band closure bags of the type shown in FIGS. 1 and 2; and

FIG. 11 is a similar schematic illustration showing steps in a method of making draw band bag closures resulting in the structure of FIG. 6.

In FIGS. 1, 2 and 3, a bag 45 is depicted having a body comprising respective wall panels 47 joined along a bottom fold 48 where the bag is made from a single sheet of flexibly pliable plastic film or sheet material, but which may be a heat-sealed seam if preferred. To complete the pocket provided by the bag, opposite side heat-sealed seams 49 join the wall panels 47 from the bottom fold to and inclusive of a lip portion of the bag about an openable mouth 50 at the top of the bag. If preferred, the bag could be made with only one side seam 49, while the opposite side may be a fold.

Draw band means 51 are provided about the mouth 50 to enable draw-up closing of the bag, and in this instance comprising at least one, but desirably two draw bands comprising an upper draw band 51a and a lower draw band 51b. These draw bands are normally enclosed with a flat tunnel 52 formed by respective folded over strips 53 of suitable plastic sheet material heat-sealably compatible with the material of the bag body, and doubled over to lap the bands and an adjacent portion of each of the body panels 47 to which the marginal portions of the tunnel strips lapping the inner and outer sides of the wall panels preferably are secured by respective heat-seals 54. At their opposite ends, the tunnel strips are sealed in the heat-seal seams 49.

Simply and economically, the draw strips 51a and 51b are formed from the terminal portions of the mouth margins of the bag wall panels 47. Where only one of the draw bands is desired, a preferred width of the marginal extremity of each of the wall panels 47 is partially severed along a transverse line 55, desirably by relatively long discontinuous aligned incisions or elongated perforations or nicks with intervening narrow tear connections 57. Where, as shown in FIGS. 1-3, two of the draw bands 51a and 51b are provided, a second line of partial separation 58, with narrow tear connections 59 is provided in suitably spaced relation to the separation line 55 such that both of the draw bands comprises material of the bag wall panels. To facilitate separation of the draw band strips 51a and 51b from one another and from the bag wall panels, and to enable pulling the draw bands from the tunnel 52, respective openings 60 and 61 are provided in the tunnel strips 53 at the respective opposite sides of the lip portion of the bag, and more particularly at the side seams

49. In each instance, these openings are large enough to enable grasping of the accessible end portion of the associated draw band between the thumb and forefinger for pulling the band out of the tunnel. In respect to the openings 60, a limited area 62 of the tunnel strips 53 aligned with the upper draw band section 51a at one of the side seams 49 is at least partially separated as by incising, perforating or nicking and for convenience is attached at small tear point connections 63 to the tunnel strip members 53 so as to be separable therefrom on pulling the draw band 51a out through the opening 60. Similarly, the opening 61 is provided in alignment with and of a size to permit pulling of the lower draw band section 51b therethrough and is formed by at least partial separation of an area 64 from the tunnel strip members 53, with narrow tear point, separable small connections 65 between the separable area and the tunnel strips 53. Through this arrangement, the bag 45 is adapted to lie flat, inclusive of the tunnel area thereof and the draw bands, which facilitates packing in quantity for storage and shipment.

When it is desired to close the bag 45, the pre-perforated areas 62 and 64 are grasped between thumb and forefinger of the opposite hands and then a lateral pull is applied causing such areas to be separated from the tunnel strips 53 and at the same time causing the draw bands 51a and 51b to be separated from one another and from the side wall panels 47 and pulled out of the respective openings 60 and 61, while the opposite anchored ends of the draw bands draw the bag neck into puckered bag mouth-closing relation on the other respective draw band in each instance, as demonstrated in FIG. 3. Since the ends of the draw band sections in each of the wall panel portions of the tunnel 52 are sealed together at their ends, the draw bands provide loops which after they are pulled out as shown in FIG. 3 may be used as carrying handles. To again open the bag, the anchored portions of the draw bands are grasped and pulled apart, thus drawing the loop portions of the draw bands back into the tunnel 52.

Where a double-ply draw band structure is desired, the construction of FIG. 4 may be employed. In this form instead of a single-ply of the bag wall material forming the respective draw bands, a double-ply of the material is used, conveniently attained by folding over the mouth marginal portions of the bag wall panels 47 upon themselves to a width equal to the width area of the draw band or draw bands, as the case may be, thus, in the two draw band arrangement, the draw band 51a comprises a second, folded over ply 51a', and the draw band 51b comprises a second ply 51b' which is an extension of the fold-over which provided the second ply 51a'. To separate the double-ply sections 51a' and 51b', the fold over ply material is provided with a line of partial separation 55' which matches the separation 55. While the double-ply sections 51a' and 51b' may be secured to the basic draw band sections 51a and 51b, respectively, that is not essential because the double-ply sections are secured into the assembly by the same heat-seals 49 as the basic band sections, and through the heat-seals 49 the basic and double-ply sections are secured together at the ends which join the two sections at each face portion of the mouth area of the bag.

Another form of multi-ply draw band structure is depicted in FIG. 5 where separate strips of flat band material 67 are associated with the respective marginal portions of the bag walls 47 which provide the draw band

sections 51a and 51b. One of the advantages of this construction is that the material 67 may be of any desired gauge and especially where a heavier gauge material for more rugged service is desired or required. As shown it will be observed that the material 67 is at least slightly thicker than the material of the bag body. The material of the strip 67 may also be of a different kind than the body of the material, although it is preferred that it be at least compatible for heat-sealing purposes, namely, that during heat-sealing the material of the strips 67 be capable of fusing with the material of the bag body as well as the tunnel strips 53. A single piece of material for each of the strips 67 to provide a section for double-ply association with each of the band sections 51a and 51b at each face of the tunnel may be provided, or each of the double-ply band sections may be a separate strip, as preferred. Where a single piece of material is used for each of the band strips 67, a line of partial severance 68 is desirably provided matching the line of severance 55. Otherwise, the structure is the same as in FIGS. 1 and 4.

A desirable arrangement as shown in FIG. 6 has the draw band structure 51 as well as the tunnel structure made in one piece with the bag body panels 47 by folding of the bag material. To this end, the material of the bag walls is extended at the mouth end and folded over into itself to provide the tunnel structure 53', instead of providing the separate tunnel strips 53 of FIGS. 1-5, and the draw band structures 51 comprise a return bent terminal flange portion which is folded in between the inner and outer portions of the tunnel structures 53', wherein one of the wall panels of the tunnel structure at each wall of the bag comprises a continuation of the respective body wall panel 47. The folded flange parts are secured together by the heat-seal or welded seams 54. Separability of the band sections 51a and 51b from the in-folded portions is accomplished in the same manner as previously described by lines of partial separation 55 and 58, and other features of the bag structure are the same as already described.

Instead of side pull draw band means, center pull draw band means may be provided in a bag 70 (FIG. 7) wherein flat wall panels 71 may be constructed similarly as already described, heat-sealed along the sides of the bag to provide seams 72 and with the mouth end portion of the bag provided with a tunnel structure 73 which may embody any of the previously described arrangements and secured in place to the bag wall panels by means of heat-seal seam 74. Within the tunnel is provided a draw band 75 which is actually in two sections, one within each of the panel portions or sections of the tunnel structure 73, and with each of the sections of the band adapted to be pulled outwardly through a central opening 77, in this instance opening upwardly through the top edge of the tunnel structure and notched downwardly sufficiently to expose a substantial area of the band to be grasped for withdrawal. Since the opposite ends of the band sections are firmly secured in the seams 72, as the band sections are pulled out of the holes 77, the side edges of the mouth and of the bag are drawn together into closing relation, as indicated in dash outline. Construction of the draw band 75 may be according to any of the described forms, the band portion of the body side panel in each instance being partially separated therefrom along a line of partial severance 78 with short tear connections 79 readily separable when the draw band 75 is initially pulled out

of the opening 77. Return to the open condition of the bag is readily effected by grasping the opposite ends of the draw band through the enclosing side marginal end portions of the tunnel structure 73 and pulling in respective opposite directions to pull the draw band back into the tunnel.

In FIG. 8 a similar bag 70' is depicted in which similar parts are identified by the same reference numerals as in FIG. 7, but in which the draw band 75' is arranged to be drawn out through a central opening in the tunnel structure 73' located in spaced relation to the mouth edge of the tunnel structure. This, in effect, provides a handle 73a across the top of the opening 77' by which the bag may be carried if preferred. When it is desired to pull the top of the bag closed, the draw band 75' is pulled either toward the inside or toward the outside of the respective section of the tunnel 73' and the sides of the bag at the mouth drawn together in similar fashion as in the dash outline showing in FIG. 7, the mouth being returned to open condition in similar fashion as described for the bag 70.

In still another modification as depicted in FIG. 9, a bottom-open bag 80 is provided of a type which is especially suitable for packaging bakery products such as bread, rolls, cookies, and the like, and wherein a fully closed package is desired until access to the contents must be had. For this purpose, the bag 80 has opposite wall panels 81 which are secured together at side seams 82 similarly as described in connection with the other forms of the invention herein and wherein the bottom ends of the panels are unsecured at their terminal edges until the bag is loaded, one of the wall panels being desirably extended to provide a tab flange 83 which may be folded over the shorter of the panels 81 and sealed thereto for closing the bag.

At their opposite end portions, the wall panels 81 are connected together and desirably integrally in one piece and being in-folded to provide a re-entrant mouth closure or gusset 84 which may be imperforate where a substantially air-tight package is desired, but which may be provided with perforations 85 along the re-entrant joint to enable tearing the gusset open for access to the bag contents.

Between the gusset 84 and the body wall panel portions 81 of the bag the bag material is reversely folded upon itself whereby to provide respective opposite but connected sections of a double draw band 87 enclosed within a tunnel 88 provided between an outer fold flange portion 89 and the adjacent flange portion of the gusset 84. Securement of each of the tunnel folds is by a heat-seal seam 90 along its lower edge to the intervening portion of the panel 81 and the adjacent flange portion of the gusset. This closes the tunnel 88, and seals the interior of the bag from the tunnel and from openings 91 from the tunnel, such as at the center of the opposite tunnel sections through which the draw band sections 87 are adapted to be pulled to drawing the bag mouth closed when desired, and involving separation of the draw band sections along lines of partial separation 92, the opposite ends of the draw bands being, of course, secured fast in the assembly along the seams 82.

Any form of the bag according to FIGS. 1-9, is simply, efficiently and economically producible by high speed, on-stream manufacturing process wherein thermoplastic pliable sheet or strip material is fed from suitable rolls to continuous fabricating apparatus including

any preferred nicking or punching means, folding means, heat-sealing and cut-off means. In FIG. 10 a representative method of making the bag of FIGS. 1-3 is depicted, wherein the tunnel strip material 53 having the properly placed and dimensioned draw band opening tear-out areas 62 and 64 pre-nicked therein is assembled with the margin of the selected body 47 which has been pre-nicked along the separation lines 55 and 58. It will be understood that one of the tunnel strips 53 is assembled with each opposite longitudinal margin of the web 47 to provide the opposite walls of the completed bag. After the tunnel strips 53 have been folded onto their respective draw band margins of the bag body web 47 and secured thereto by means of the seam 54, the body web is folded upon itself to bring the tunnel sections together, and then the heat-sealed side seams 49 are formed across the folded web by hot wire or other method, and across the tear-outs 62 and 64 so that each tear-out area remains half on one and half on the next succeeding finished bag. This completes manufacture of the bags and they can be bundled or otherwise packed as they come off of the production line, one flat upon the other.

In FIG. 11 steps in a method of making a bag resulting in the structure of FIG. 6 are depicted, wherein the entire bag, including the tunnel structure and the draw bands are adapted to be constructed from a single sheet or web of plastic sheet or film material. Accordingly, the body web 47 is pre-nicked along both longitudinal marginal portions thereof to provide, at properly spaced intervals and of proper size, the draw band tear-out areas 64 and 62 at respectively opposite sides of a longitudinal line F along which the web will eventually be folded to provide a section of the tunnel for the bag mouth. Also pre-nicked in the respective marginal areas are the lines of partial separation 55 and 58 for the draw band sections 51a and 51b. As the web 47 progresses along the production line, the terminal marginal portion having the draw band sections 51a and 51b is folded along a longitudinal parallel line F' onto the section 53' which will provide the outer flange portion of the tunnel, whereafter the portion 53' is folded over along the line F to the adjacent portion of the web 47, and secured by the heat-seal seam 54, and then the two opposite formed marginal tunnel sections of the web brought together by folding the two halves of the web 47, and the individual bag severed along side edge seams 49 provided. As thus completed, the bags are readily stacked or bundled or otherwise packed in flat condition one upon another.

Although the method has been particularly illustrated and described in relation to only two of the basic configurations in making the bags, it will be understood that the other configurations specifically described such as in FIGS. 4, 5 and 7-9 involve substantially the same method, with additions of folds or strip material, all of which lend themselves quite readily to on-stream continuous, high speed, low cost, efficient mass production manufacture.

It will also be understood that while for illustrative purposes the several bags have been illustrated as made from transparent material, which is acceptable, and desirable for certain purposes, any degree of opacity may be present in the material or any portion thereof, as may suit particular preferences. Further, the material may be imprinted, such as in individual bag sections thereof in any feasible manner desired.

It will be understood that variations and modifications may be effected without departing from the spirit and scope of the novel concepts of this invention.

I claim as my invention:

1. In a bag made from pliable sheet material providing a bag body with a mouth at one end of the body defined by a lip portion providing a tunnel:
 said body having an integral portion thereof closed within said tunnel and partially separated therefrom with relatively minute tear points connecting it to the body and providing a flat draw band; and said tunnel having at least one opening therein through which the draw band is adapted to be pulled for closing said mouth;
 said draw band comprising a folded over double-ply portion of the bag body.
2. In a bag made from pliable sheet material providing a bag body with a mouth at one end of the body defined by a lip portion providing a tunnel:
 said body having an integral portion thereof enclosed within said tunnel and partially separated therefrom with relatively minute tear points connecting it to the body and providing a flat draw band; and said tunnel having at least one opening therein through which the draw band is adapted to be pulled for closing said mouth;
 said tunnel and said draw band comprising integral folded portions of the bag body.
3. In a bag made from pliable sheet material providing a bag body with a mouth at one end of the body defined by a lip portion providing a tunnel:
 said body having an integral portion thereof projecting into, extending throughout the length of and enclosed within said tunnel, and said portion being partially separated from the body along a line extending lengthwise throughout the length of the tunnel with relatively minute tear points connecting said portion to the body whereby said portion provides a separable flat draw band; and
 said tunnel having at least one opening therein through which the draw band is adapted to be pulled for closing said mouth.
4. In a bag according to claim 1, said tunnel comprising a separate tunnel strip applied to said bag body about said mouth to enclose said draw band.
5. In a bag according to claim 1, the material of the bag and tunnel comprising heat-sealable plastic material, said bag body comprising flat panels joined along opposite side edges, and said opening being at one of said side edges.
6. In a bag according to claim 1, said opening being defined by a tear-out area of the lip tunnel portion and adapted to be torn out when the draw band is initially pulled out through said opening.
7. In a bag according to claim 1, said draw band comprising a folded over double-ply portion of the bag

body.

8. In a bag according to claim 1, an additional layer thickness of material along said draw band providing a multi-layer draw band.

9. In a bag according to claim 1, said tunnel and said draw band comprising integral folded portions of the bag body.

10. In a bag according to claim 8, a gusset fold of the bag body providing a part of the tunnel at the inside of the mouth providing an initial closure for the mouth.

11. In a bag made from pliable sheet material and having opposite side edges and a mouth at one end defined by a lip portion thereabout and providing a tunnel:

said bag comprising body panels joined together at said side edges;

integral portions of said panels projecting into said tunnel and extending throughout the length of the tunnel;

two spaced parallel lines of partial separation extending lengthwise of the tunnel in each of said integral panel portions to define a pair of draw bands and with the draw bands of the portions aligned in co-extensive relation;

the aligned draw bands on said portions being permanently connected together at their ends; and openings in offset relation to one another provided at the opposite ends of the tunnel through which the respective aligned bands are adapted to be pulled in opposite directions for drawing the bag mouth closed by grasping the respective aligned bands at the openings and pulling thereon to separate the bands from one another and from said panels.

12. In a bag according to claim 11, said tunnel comprising a separate piece of material folded about said panel portions and secured thereto clear of said draw bands.

13. In a bag according to claim 12, said panel portions being doubled over within the tunnel to provide double-ply draw bands.

14. In a bag according to claim 12, reinforcing material extending along said draw bands within said tunnel.

15. In a bag according to claim 11, said panels being folded upon themselves to provide said tunnel and said integral portions comprising margins of the panels folded into the tunnel.

16. In a bag according to claim 11, said panels being folded upon themselves to provide said tunnel, additional folds of the panels being enclosed within the tunnel and providing said integral portions, and seams securing the folds inwardly from the bag mouth leaving said portions free within the tunnel for separation of the draw bands along the partial separations in response to the pulling force to draw the bands from said openings.

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