

May 23, 1967

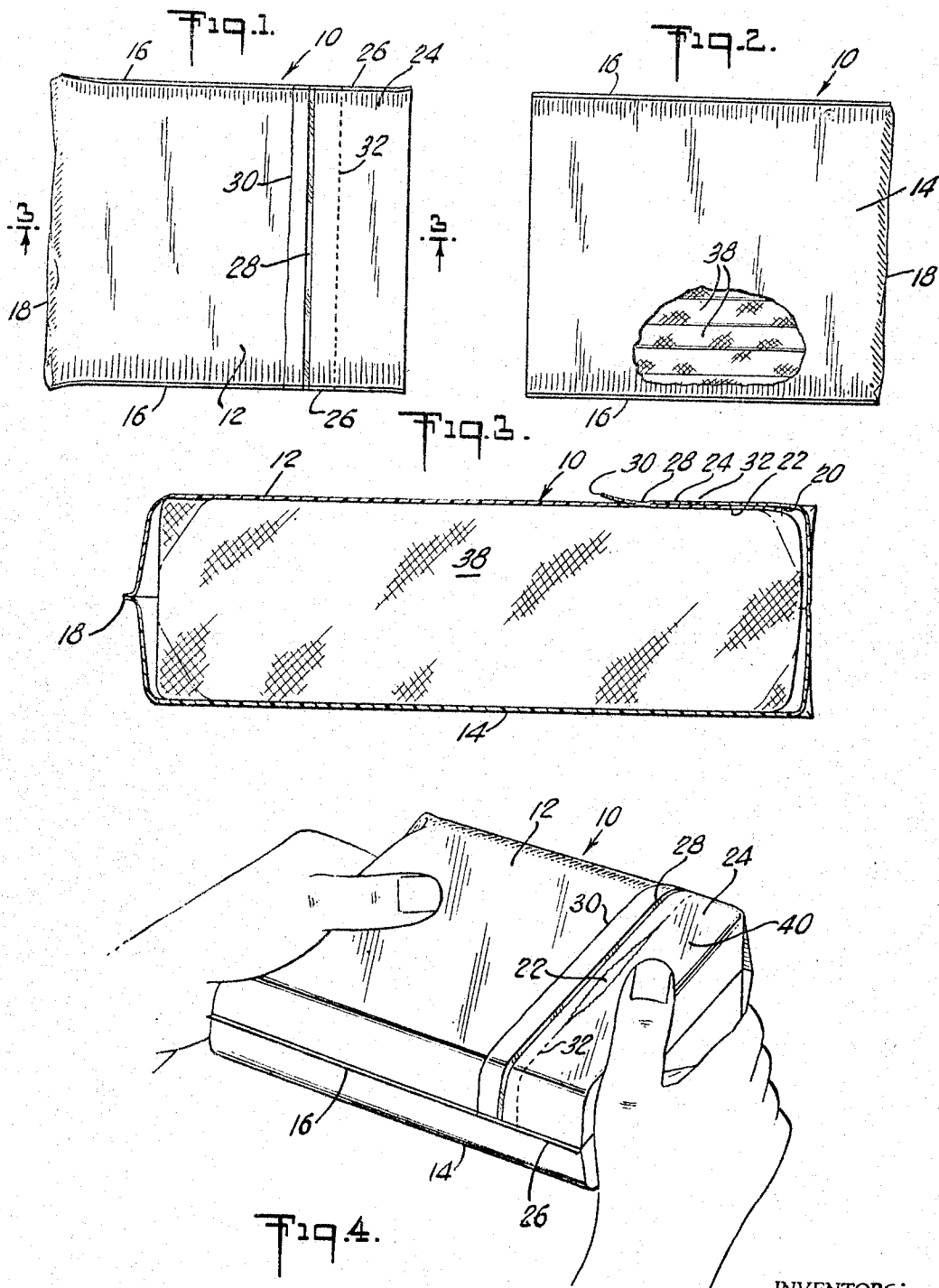
M. B. ELLS ETAL

3,320,863

METHOD OF MAKING FLEXIBLE BAG-LIKE CONTAINERS

Original Filed June 12, 1963

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

Fig. 5.

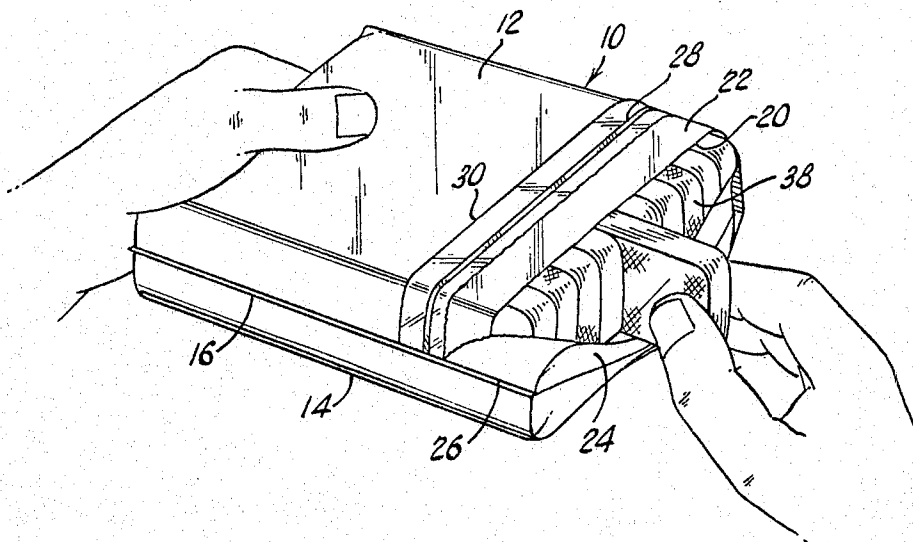
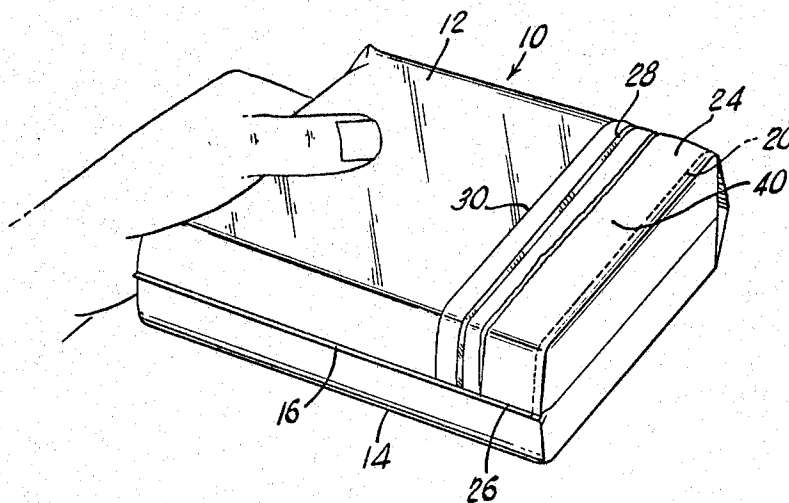


Fig. 6.



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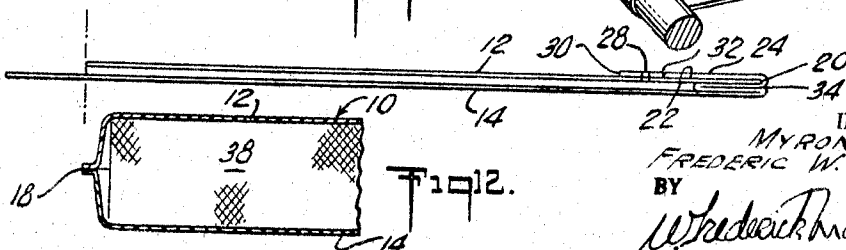
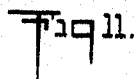
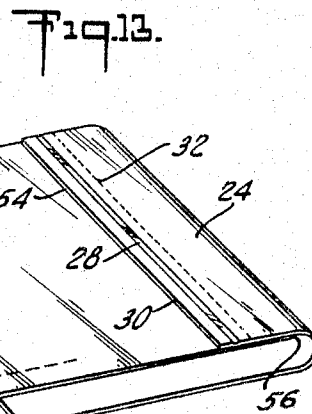
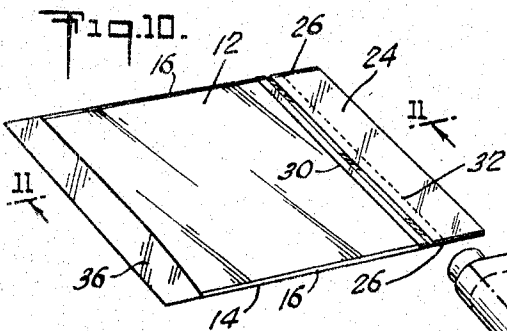
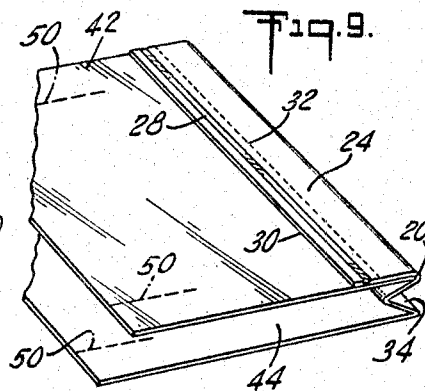
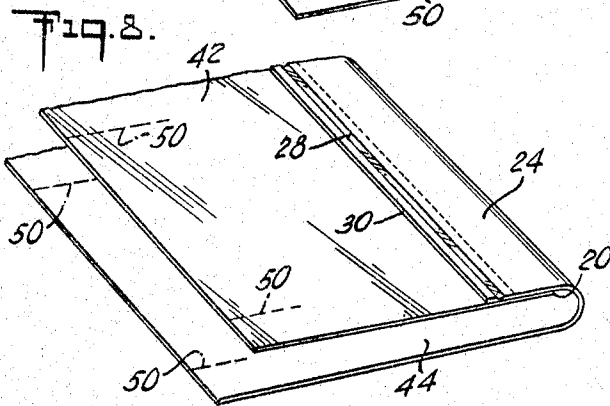
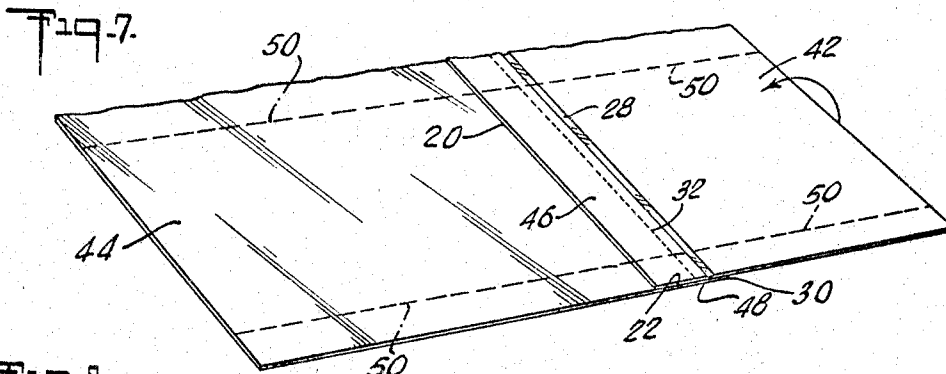
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METHOD OF MAKING FLEXIBLE BAG-LIKE CONTAINERS

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3 Sheets-Sheet 3



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3,320,863

METHOD OF MAKING FLEXIBLE BAG-LIKE CONTAINERS

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14 Claims. (Cl. 93—35)

This application is a division of our copending application, Ser. No. 287,371, filed June 12, 1963.

This invention relates to containers and more particularly to improvements in flexible bag-like containers and to methods of making them.

One type of flexible bag-like container which has been commonly used in the packaging field is made from a plastic, such as polyethylene sheeting. The container is normally flat and has superposed front and back walls which are secured together at their vertical side edges and at their bottom edges. One of the walls extends beyond the top edge of the other wall and the extended portion is folded downwardly around the top edge of the other wall into overlying relationship with its upper exterior portion. This overlying extension is secured at its end edges to form a closure flap which extends across the width of the container. The closure flap is unattached at its bottom edge so that it may be folded back to permit access into the interior of the container for removal of all or part of its contents. Thereafter, the flap may be returned to its original position to close the container without tearing or destroying it.

Containers of the foregoing type have achieved commercial success because they are flexible, inexpensive, may be made attractive, and of transparent or opaque material, and, as noted above, because they permit ready removal of contents without destroying the container. However, because the closure flap of such containers is not secured at its bottom edge, extraneous matter may enter into the container under the flap, particularly if the flap does not fit into snug, conforming relationship with the upper exterior portion of the wall its overlies. In addition, since the flap may be readily folded back, the container is not tamper proof and its contents can be removed from the package with relative ease and handled. These features of such containers detract from their advantages and also limit their application as containers for other commodities. For example, in packaging articles which must be delivered in a clean and sometimes sanitary condition, such as bakery goods and meats, and articles for personal use, such as sanitary napkins, tampons and bandages, the possibility that extraneous matter may enter into the container is undesirable. In addition, containers for such articles should not be easily opened to prevent handling the articles contained therein.

The present invention is directed to improvements in such containers. The container of the present invention comprises a normally flat, flexible, bag-like container having superposed front and rear walls and a closure flap having its bottom edge secured in position. The closure flap is weakened so that it may be easily and readily ruptured, whereupon it may be folded back in the customary manner to provide access into the interior of the container. By providing a closure flap which is initially secured in position, foreign and extraneous matter cannot enter into the interior of the container beneath the flap. If the flap is ruptured, it is indicative that the container or its contents may have been tampered with. The container is made ready for filling through the bottom by leaving the bottom edges unsecured. After filling, the bottom edges are secured together to close the container. The container is simple and economical to manufacture

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and, although it effectively seals the container contents, it can be readily opened and is reusable.

Reference is made to the accompanying drawings and to the following detailed description which are, by way of example, illustrative of the invention. It is to be understood, however, that the invention is not limited to the disclosed embodiments and that other embodiments are contemplated.

In the drawings:

FIG. 1 is a front view of the container lying on its side; FIG. 2 is a rear view of the container of FIG. 1, partially broken away to disclose its packaged contents; FIG. 3 is an enlarged view of FIG. 1 taken along lines 3—3;

FIG. 4 is a view of the container illustrating a manner in which the closure flap is ruptured to provide access into its interior;

FIG. 5 is a view illustrating folding back of the closure flap after rupture and removal of part of its contents;

FIG. 6 is a view illustrating the manner in which the closure flap is returned to close the container after its contents have been removed;

FIG. 7 is a view of two sheets of heat-fusible material associated in overlapping relationship and illustrates a preliminary step in making the container;

FIG. 8 is a view of the overlapped sheets of FIG. 7 after they have been folded over into superposed relationship;

FIG. 9 is a view similar to FIG. 8 illustrating a gusset fold in one of the sheets;

FIG. 10 is a view of the superposed sheets of FIG. 8 after they have been flattened, cut transversely at spaced intervals, and sealed to provide a container ready for filling through the bottom;

FIG. 11 is a view of FIG. 10, on an enlarged scale, taken along lines 11—11;

FIG. 12 is an enlarged view of the bottom portion of the container after it has been filled and the bottom edges of the walls sealed together; and

FIG. 13 is a view of a preliminary step of an alternative method of making the container and illustrates a single sheet of material folded upon itself with its longitudinal side edges overlapping.

Referring to the drawings, an embodiment of the invention comprises a normally flat, flexible bag-like container 10 having rectangularly-shaped, superposed walls, 12 and 14, whose vertical side edges 16 and bottom edges 18 are in alignment. One of the walls, which for convenience will be referred to herein as rear wall 14, is longer than the other wall, referred to herein as front wall 12, to form an extending portion which extends beyond the top edge 20 of the front wall. The extending portion of the rear wall 14 is folded transversely over top edge 20 of the front wall downwardly into overlying relationship with the upper exterior portion 22 of the front wall 12. This overlying extension forms a closure flap 24 which extends across the width of the container.

The aligned vertical side edges 16, bottom edges 18 of the front and rear walls, and the opposite ends 26 of the closure flap, are secured. In this form, because the bottom edge of the closure flap is unsecured, the flap may be distorted and folded upwardly and back to permit access into the space between the front and rear walls which define the interior of the container.

In accordance with the invention, the closure flap 24 is secured to the upper exterior portion 22 of front wall 12 along line 28 which is at or adjacent to and parallel to the bottom edge 30 of the closure flap, thereby sealing the container. By so securing the closure flap, it cannot be folded back in the customary manner to permit access into the interior of the container. In order to permit the flap to be folded back, the flap is provided

with a transversely-extending rupturable area which may be in the form of a line of perforations 32 which extends across the flap and parallel to its bottom edge 36. The line of perforations is located above the line 28 at which the flap is secured to the front wall. The top portion of the front wall extends above the line of perforations. After rupturing along the line of perforations, the portion the flap above the line of perforations may be folded back in the customary manner to provide access into the container. The portion of the flap below the line of perforations remains secured to the front wall. After the flap has been folded back to remove all or part of the container contents, it may be returned into overlying relationship with the upper exterior portion of the front wall to again close the container. Since the top exterior portion of the front wall extends above the line of perforations, the portion of the closure flap above the line of perforations will overlap the top exterior portion of the front wall to form an effective closure.

The container may be constructed from a variety of materials, but is preferably made from a heat-fusible material, such as polyethylene sheeting. Such material permits the vertical side edges of the front and rear walls, their bottom edges, the opposite end edges of the closure flap and the bottom edge of the flap to be secured by heat sealing. Plastic materials such as polyethylene and polypropylene are especially suitable because they may be readily cut simultaneously with the heat sealing operation.

In its preferred form, the extending portion of the rear wall is formed with a gusset 34 or similar fold, as illustrated in FIGS. 9 and 11, which permits the container to be expanded in depth. The gusset may be obtained by transversely folding the extending portion of the rear wall downwardly along a line adjacent to the top edge of the front wall and then upwardly upon itself to form a fold having a V-shaped configuration. The extending portion of the rear wall is folded downwardly again into overlying relationship with the upper exterior portion of the front wall to form the closure flap. If desired, the bottom of the container may also be provided with a gusset or similar fold so that the bag may be uniformly expanded in depth.

The container may be provided ready for filling with the closure flap secured along its bottom edge to the front wall and with the bottom edges of the front and rear walls unsecured so that the articles desired to be packaged can be placed into the container through its open bottom. After the articles are so placed, the bottom edges of the front and rear walls are then secured together. In the preferred form of the invention, the bag is formed with one of the walls, e.g., the rear wall, extending a short distance 36 beyond the bottom edge of the front wall to permit the walls to be separated more readily. After the contents are placed into the container, the bottom edges of the walls are secured together and the excess trimmed off.

In packaging such container, air is often entrapped in the interior, causing the container to bellow out. If a line of perforations is used to form the rupturable part of the closure flap, the entrapped air can escape through the perforations and the container will maintain the desired form.

To open the container to remove its contents 38, the top portion 40 of the container above the line of perforations 32 may be grasped with one hand and the portion of the container below the line of perforations grasped with the other hand, either at the opposite end or at the side. The container is then bent backwardly along the line of perforations, thereby placing the front wall of the bag and the secured closure flap under tension. The tension causes the closure flap to separate along the line of perforations, whereupon the part of the flap above the line of perforations becomes detached. Thereafter, the closure flap may be folded back so that the container

contents can be removed. The closure flap can be returned to its overlying position on the front wall, thus closing the container for continued use.

The bag may be made in accordance with the method illustrated in FIGS. 7-10. As illustrated, two elongated sheets 42 and 44 of heat-fusible material, such as polyethylene sheeting, are arranged in aligned relationship with their adjacent, longitudinal edge portions, 46 and 48 respectively, overlapping. The amount of overlap is approximately equal to the height desired in the closure flap and the overlapping edge portion 48 of sheet 44 forms the closure flap in the completed container. Sheet 44 is provided with the line of perforations 32 positioned inwardly from that longitudinal edge of the sheet which lies in overlapping relationship with sheet 42. Sheet 44 forms the flap closure and rear wall of the completed container. The sheet is, therefore, of sufficient width to form a closure flap of the height desired and a rear wall of the length desired in the completed container. Sheet 42, which forms the front wall of the completed container, is sufficiently wide to form a front wall of the length desired in the completed container.

After the sheets are arranged in overlapping relationship, the overlapped portions are heat sealed or otherwise secured together along a line 28 parallel to the line of perforations and between the line of perforations and the overlapped longitudinal edge of sheet 44. After the sheets are heat sealed together, sheet 42 is folded around its overlapped longitudinal edge along a line parallel thereto into superposed relationship with sheet 44. Alternatively, sheet 44 may be folded around the overlapped longitudinal edge of sheet 42 along a line parallel thereto into superposed relationship with sheet 42. The sheets are so folded that the overlapping portion of the sheet provided with the perforations is located on the upper exterior portion of the second sheet. This overlapped portion forms the closure flap.

After the sheets are so folded, the two sheets are cut transversely at spaced intervals 50 at distances corresponding to the widths desired in the completed containers. The portions of the sheets adjacent to the cuts form the vertical side edges of the container. The sheets so cut form individual containers having a secured closure flap and ready for filling through the bottom. Preferably, cutting and heat sealing of the sheets is done simultaneously. This may be achieved, in accordance with known practices, by using a hot wire or a thermal impulse sealer. The end of the container opposite the closure flap remains open and unsealed to provide an opening through which the articles desired to be packaged may be placed into the interior of the container. After the contents are so positioned, the bottom edges of the front and rear walls are heat sealed together.

As is apparent from the foregoing method, the containers may be made in a continuous operation on automatic bag-making machinery from continuous lengths of heat-fusible material supplied from rolls.

If it is desired to provide a container with the gusset 34, sheet 44 is made of sufficient width to form the gusset which is positioned between the top inner surfaces of the front and rear walls of the container. Suitable folding devices may be used to form the gusset and also to fold the respective sheets into overlying relationship with each other as described above.

The containers may also be made from a single sheet of heat-fusible material. As illustrated in FIG. 13, a sheet 52 of such material is provided with the line of perforations 32 which extends longitudinally and which is adjacent and parallel to one longitudinal edge 54 of the sheet. The sheet is doubled upon itself in a lengthwise direction into a flat tubular form with its longitudinal, side edge portions overlapping and with the line of perforations and the adjacent longitudinal edge 54 of the sheet on the exterior. The amount of overlap is approximately equal to the height desired in the closure

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flap. The tube is then flattened to form a fold or a gusset at and parallel to the inside longitudinal edge 56 of the sheet. The portion between the fold and the outside longitudinal edge 54 of the sheet forms the closure flap 24. After the sheet is formed into the flat tubular form, the overlapped portions are heat sealed along line 23 parallel to and between the line of perforations and the adjacent, outside longitudinal edge 54 of the sheet. Heat sealing may be effected in the customary manner by using a backing plate which is positioned in the interior of the tube directly below the line along which the overlapped portions of the sheets are to be heat sealed.

The portion 58 of the tube opposite the fold at the inside longitudinal edge of the sheet may then be slit longitudinally to form two separate superposed sheets heat sealed together at the closure flap. The sheet may be slit longitudinally as at 60 to form front and rear walls of the same or of different lengths. After slitting, the sheets are cut and heat sealed transversely at spaced intervals, in the manner described above, depending upon the width of the container desired, to form individual containers ready for filling. The containers so formed are opened at their bottoms and the articles desired to be packaged are inserted through the opening, after which the bottom edges of the front and rear walls are sealed together to complete the container.

It is to be understood that the foregoing illustrative embodiments are not to be construed as limiting the invention and that various modifications thereof and other embodiments are contemplated within its scope.

What is claimed is:

1. The method of making a flat bag which has an integral, secured closure flap comprising overlapping edge portions of sheets of heat-fusible material, one of said sheets being rupturable in its overlapped portion along a line paralleling its edge, securing said sheets in said overlapped portions between said rupturable line and said edge of said one sheet, folding said sheets into superposed relationship about the edge of the other sheet to form the closure flap, and securing the superposed sheets transversely along their side edges and the end edges of said closure flap.

2. The method in accordance with claim 1 wherein said one sheet is formed with an inwardly extending gusset adjacent to said edge of said other sheet prior to securing the side edges of said sheets.

3. The method in accordance with claim 1 wherein the rupturable part of said one sheet is a line of perforations.

4. The method in accordance with claim 1 wherein said secured portions are secured by heat sealing.

5. The method in accordance with claim 1 wherein said edge of said other sheet extends beyond said rupturable line.

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6. The method of making a flat bag which has an integral, secured closure flap comprising overlapping edge portions of sheets of thermoplastic film, one of said sheets having a line of perforations in its overlapped portion paralleling its edge, heat sealing said sheets in said overlapped portions between said line of perforations and said edge of said one sheet, folding said sheets into superposed relationship about the edge of the other sheet to form the closure flap, and heat sealing the superposed sheets along their side edges and the end edges of said closure flap.

7. The method in accordance with claim 6 wherein said one sheet is formed with an inwardly extending gusset adjacent to said edge of said other sheet prior to heat sealing the side edges of said sheets.

8. The method in accordance with claim 6 wherein said sheets are cut at the time they are heat sealed to form said side edges.

9. The method of making a flat bag which has an integral, secured closure flap comprising folding a sheet of heat-fusible material into tubular form with its edge portions overlapping, one overlapped edge portion of said sheet being rupturable along a line paralleling its edge, securing said overlapped edge portions along a line between said rupturable line and said edge, slitting said sheet along a line parallel to and displaced from said overlapped edge portions to form superposed sheets, and securing said sheets transversely along their side edges.

10. The method in accordance with claim 9 wherein said sheet is formed with an inwardly extending gusset adjacent to the said overlapped edge portions prior to securing the side edges of said sheets.

11. The method in accordance with claim 9 wherein said rupturable line is a line of perforations.

12. The method in accordance with claim 9 wherein said secured portions are secured by heat sealing.

13. The method in accordance with claim 9 wherein said heat-fusible material is a thermoplastic film.

14. The method of making a flat bag which has an integral, secured closure flap comprising folding a sheet of thermoplastic film into tubular form with its edge portions overlapping, one overlapped edge portion of said sheet having a line of perforations along a line paralleling its edge, heat sealing said overlapped edge portions along a line between said line of perforations and said edge, slitting said sheet lengthwise along a line parallel to and displaced from said overlapped edge portions to form superposed sheets, and heat sealing said sheets transversely along their side edges.

No references cited.

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