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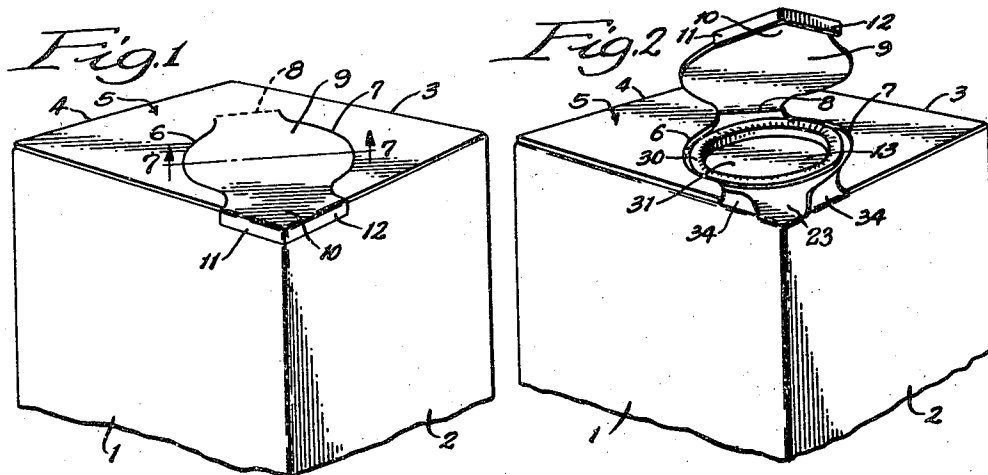
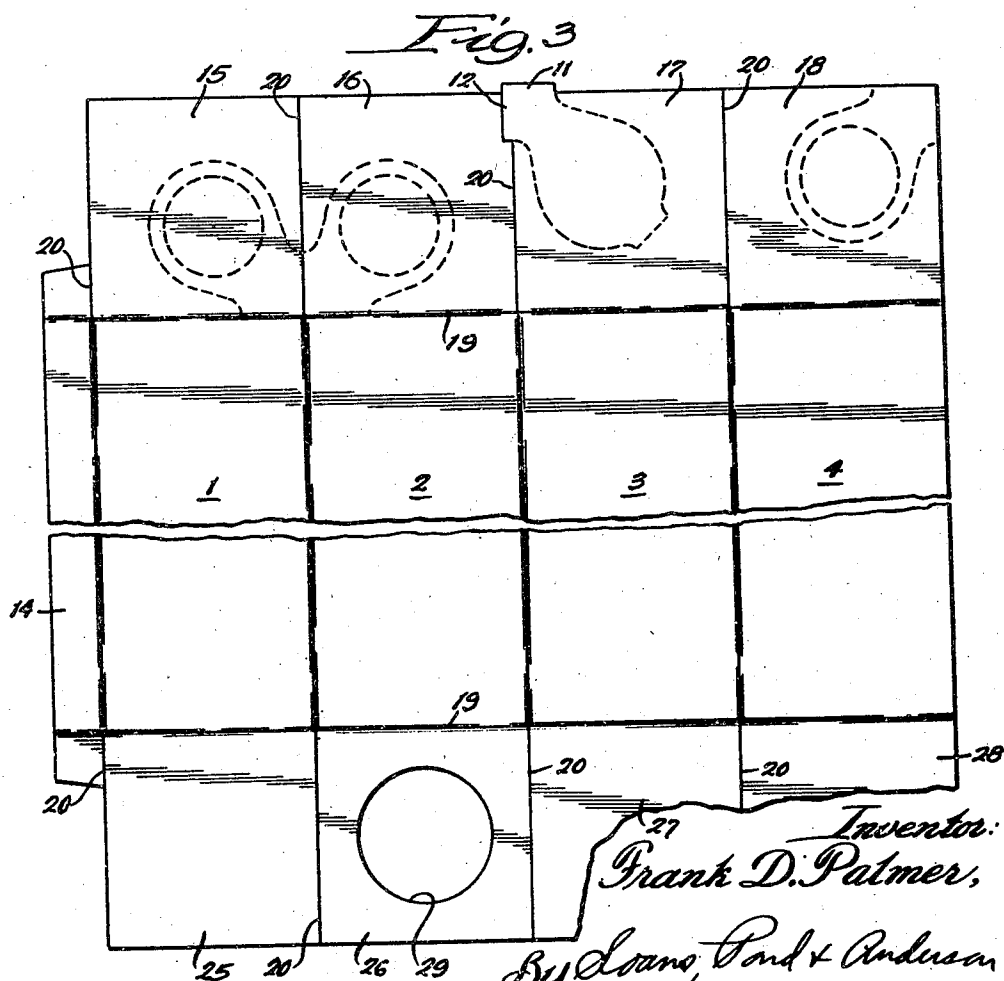
F. D. PALMER

2,435,155

PAPER BOTTLE

Filed June 5, 1944

2 Sheets-Sheet 1



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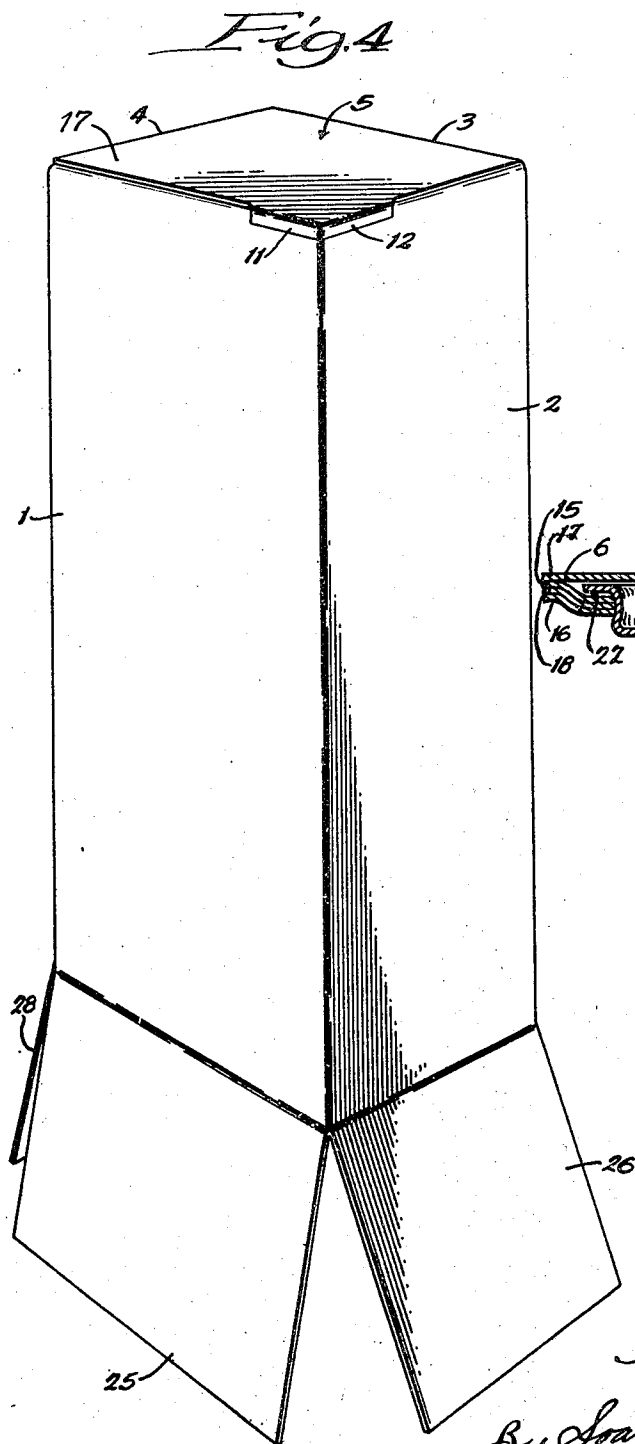
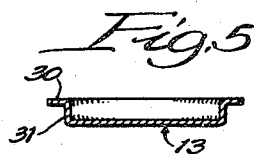
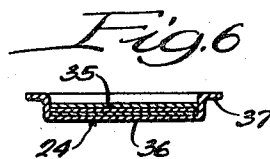
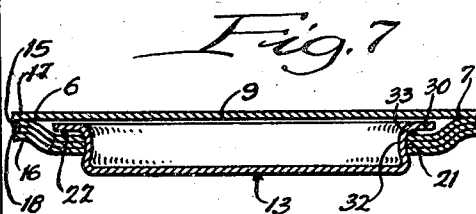
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PAPER BOTTLE

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6 Claims. (Cl. 229—17)

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This invention relates to paper bottles, and although not necessarily restricted to paper milk bottles, it will be described in connection therewith.

The main objects of the invention are to provide an improved end closure and dispensing opening arrangement in a paper bottle, and more particularly, to provide a dispensing opening which will be effectively sealed against leakage for transportation purposes, but which may be easily opened to permit pouring of the content from the bottle; to provide a top closure which will be operative to maintain clean the portions of the bottle over which milk or other content may be poured from the bottle; and, in general, it is the object of the invention to provide an improved paper bottle having improved sanitary characteristics and which may be manufactured, filled, and closed economically and at low cost.

Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawings (two sheets) wherein there is illustrated a paper milk bottle embodying a selected form of the invention.

In the drawings:

Figs. 1 and 2 are perspectives of the upper end portion of the improved paper bottle illustrating in Fig. 1 the normally closed condition of the bottle for transportation purposes, and in Fig. 2 a partially opened condition.

Fig. 3 is a plan illustrating the form of the paper blank from which the bottle is formed;

Fig. 4 is a perspective illustrating the bottle in a partially formed condition;

Figs. 5 and 6 are sections through two forms of closure plugs or caps, which may be employed as stoppers in the opening provided for pouring purposes, and

Fig. 7 is a section on the line 7—7 of Fig. 1.

The paper bottle construction shown in the drawings comprises a rectangular body having side walls 1, 2, 3 and 4, and top and bottom end closures formed by flaps extending inwardly from the top and bottom ends respectively of each of the side walls, such flaps being folded into mutually overlapping relation, and adhesively united to hold the same in end closure forming position.

In Fig. 1, the top end closure 5 is illustrated as embodying slits 6 and 7 and a crease or fold line 8 which co-operate to define a flap or ear 9. Said ear 9 is of generally circular form, except that it extended to overlie one of the corner portions of the top of the container, as indicated at 10. The corner edges of the flap 9 are further

provided with flanges or lips 11 and 12, which extend downwardly over adjacent portions of the side walls 1 and 2.

In Fig. 2, the lip 9 is illustrated in an opened position, wherein it is folded upwardly on its fold line 8 to expose a cap or plug 13, which is removably seated in a corresponding opening of the top wall 5 of the bottle.

The bottle is constructed from a generally rectangular blank, suitably creased or scored to provide foldably connected panel portions corresponding to the side walls 1, 2, 3 and 4 of the bottle, and an attaching flap 14 extending side-wise from the wall panel 1. Top end closure-forming flaps 15, 16, 17 and 18 extend from the upper ends of the wall panels, being foldably connected thereto by suitable score lines as indicated, but being separated from each other by slitting. In the blank, various score or fold lines are represented by double lines, such as indicated at 19, and slits are indicated by light, single lines 20.

The blank is first folded about the fold lines separating the wall panels so as to form a tubular body, the attachment flap 14 being adhesively secured to the inside surface of the wall panel 4. The top end closure flaps 15, 16, 17 and 18 are then folded inwardly into mutually lapping relation, and adhesively united over substantially their entire areas to form a four-ply top closure. The bottom end flaps are temporarily left open. The four-ply top closure is then subjected to a punching and pressing operation whereby the ear 9 is formed in the top ply or flap 17 and a pouring hole 21 and a downwardly offset or recessed ledge portion 22 and pouring spout 23 are formed. The location of the ear 9, the hole 21 and the pressed portions 22 and 23 in the respective end flaps of the blank is illustrated in dotted lines in Fig. 3, merely for explanatory purposes, since it will be understood from the foregoing that the said elements are not formed in the flaps prior to their being folded and united to form the end wall of the bottle. By forming the ear and dispensing hole in the flaps after they are formed into the end wall, problems of registration of holes in several flaps are eliminated, and a smooth-walled hole assured.

If the edge covering lips 11 and 12 are to be provided as shown, these lips may be formed by suitable dies either before or after the blank is formed into a tube and placed on a mandrel hereinafter referred to.

The required punching and pressing operations may be performed on the end wall by first placing

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the open-ended bottle on a suitable mandrel in a position such as represented in Fig. 4. The end of the mandrel may serve as one element of a suitable punch and die and the first punching operation will be that of slitting the top flap or ply of the end wall by means of a suitable punch to provide the aforesaid slits 6 and 7 which form the ear 9. This operation may also include the forming of the fold line 8, if the same is to be provided. The fold line 8 is not essential since the ear will readily bend at substantially that line when lifted upwardly from its opposite or free end. The punch for forming the slits 6 and 7 is preferably so constructed that the depth of slitting will be approximately equal to the thickness of the top ply of the end wall, or only slightly more so that the ear 9 is displaceable from only the said top ply of the end wall. Another punching operation is then performed on the remaining plies of the top wall, such other punching operation including the punching out of the dispensing opening 21 and the pressing downwardly of the ledge portion 22 and pouring spout portion 23. This downward offsetting of the ledge portion may be slightly facilitated by causing the slits 6 and 7 to partially penetrate the top wall ply next below the top ply in which the ear 9 is formed. Such assistance for the production of the depressed ledge is not, however, necessary or important.

By thus forming the closure ear 9 and dispensing opening 21, the ledge 22, and pouring spout 23, proper registration of the opening, the recessed portions, and the ear is accurately and certainly obtained.

In order that the ear 9 may readily be opened after the slits 6 and 7 are provided in the top ply of the top end wall, the under surface of the ear-forming portion is coated with wax or other material, to prevent such portion from becoming adhesively united to the next underlying ply of the end wall, or, for the same purpose, care is exercised to avoid the application of any adhesive to any surface portion which would cause said ear to become adhesively bonded to the next underlying ply of the end wall.

The partially formed bottle may then be withdrawn from the mandrel and the bottom-forming flaps 25, 26, 27 and 28 folded into mutually lapping relationship, and adhesively united in that position to form the bottom end of the bottle.

The opening 21 may be closed by a suitable plug 13, such as indicated in Fig. 5, which may consist of a single ply of paper board. Said plug or cap 13 may be formed from a disc of paper board punched from one of the bottom-forming end closing flaps 25, 26, 27 and 28. In this instance, the flap 26 is shown as having a punch hole 29 therein, which may represent the hole remaining after removal of the disc of paper from which to form the plug 13. As shown, the plug is of shallow cup shape having a laterally outwardly extending rim flange 30 and a main body portion 31 of an outside diameter which is just slightly greater than the diameter of the pouring opening 21 in the top wall. Such a plug may be forced into the opening 21, and will be effectively retained therein by friction, if not also by a slight interlocking effect which is obtained because of the inherent resiliency of the plug whereby it is, in effect, contracted slightly, as indicated at 32, within the opening 21, and correspondingly expanded above and below said opening, as indicated at 33. The ledge 22 is offset downwardly sufficiently to provide space

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beneath the ear 9 to receive at least the thickness of the rim flange 30 of the closure plug, and it may be more so that the ear 9 will not necessarily engage the said rim flange. If desired, the plug may be additionally secured in place by a relatively weak adhesive bonding (as by means of paraffin) between its rim flange 30 and the recessed ledge portion 22. However, it is desirable that the plug 13 be easily removable to facilitate pouring of the content of the bottle therefrom.

When the bottle is to be used for the packaging of milk or the like, it should be suitably moisture-proofed. In this instance, the paper bottle is moisture-proofed by dipping the same in a bath of suitable paraffin or wax. The wax treatment may be effected after the bottom is closed by folding and adhesively uniting the bottom-forming flaps 25, 26, 27 and 28. During such wax treatment, the plug 13 may be removed, or left out, so that wax will be permitted to flow into the milk bottle to completely coat the interior thereof, including all of the corners and joints formed both at the top and bottom ends of the container. Excess paraffin will be poured from the interior of the container by inverting the container. The coating operation thus completely coats any exposed raw edges of the paper board, including the raw edges formed by punching the dispensing hole 21.

The plug 13 is preferably similarly coated so that when the plug is inserted in the opening 21 after the container is filled with milk, the interengaging wax coatings will serve as a bond for lightly adhesively holding the plug in place. The normal adhesive relationship between paraffin-coated surfaces will also serve to hold the lip or ear 9 in closed position. Areas of sealing interengagement between said ear and the top of the bottle occur around the edges of said ear and at areas 34 on opposite sides of the depressed pouring spout, if provided. If the lips 11 and 12 are used, attachment will occur also at corresponding areas of the side walls 1 and 2.

A modified form of closure plug 24, shown in Fig. 6, may be employed if it is desired to avoid removing a disc of material from one of the bottom flaps to form the described closure plug 13. In the modified construction, the three-ply disc punched out to form the pouring opening 21 may be employed to form the main body of the disc plug, as indicated at 35. The three-ply plug body is itself a snug fit in the opening 21, and to additionally support such plug, a disc of heat sealable material 36, such as "Pliofilm" or "Parakote" is applied over the bottom and the periphery of the plug body, a marginal portion of the heat sealable material being extended laterally outwardly, as shown at 37. The arrangement is such that when the thus covered or lined plug body 35 is returned to substantially its original position in the opening 21, the rim flange portion 37 of the heat sealable covering of the plug body will overlie the recessed surface 22 of the three-ply top structure to which it may be attached by the application of relatively low heat and pressure. The degree of attachment may, of course, be varied considerably by appropriately controlling the application of heat. This plug structure avoids the punching out of material from one of the bottom-forming flaps of the blank, and it also avoids any waste of material incident to the removal of the disc 35 from the three-ply top structure.

The plug 13 or 24 may, if desired, be adhesively

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attached to the ear 9. In that case, the bonding between the closure plug and the ear 9 should be made strong enough to cause the plug to be removed from the opening 21 when the ear 9 is opened to the position shown in Fig. 2. However, such attachment is not preferred and instead, it is preferred that when the ear is opened, the plug remain in place.

After the bottle is filled and the closure plug inserted, the ear 9 is sealed in its closed position by the application of heat, as by means of a hot iron, or otherwise, over the top of the cap, whereby the paraffin coatings on the interengaging edges and surfaces of the ear and the end wall will become fused to seal the ear in closed position. Such seal may easily be broken by a more or less peeling action which occurs when pulling on the free end of the ear to lift the ear to its open position. By thus providing a sealed-down ear over the pouring spout and opening, and over the closure plug, dirt and foreign matter is kept away from the said parts so that a clean and sanitary dispensing arrangement is provided.

The plug, or stopper, for the opening is, of course, preferably coated with wax, and its wax coating also co-operates with the wax coating of the end wall to insure a leakproof joint between the plug and the dispensing opening. The heat applied for sealing the ear in closed position may be sufficient to also similarly seal the stopper in place. Removal of the stopper may, nevertheless, be easily effected since the bonding effect of the paraffin coatings is not strong enough to objectionably hinder breaking of the sealed joint.

The stopper may be repeatedly inserted in the opening so long as there remains any need for closing said opening. The rim flange provided in each form of stopper effectively prevents forcing of the stopper through the hole into the interior of the bottle. The ear 9 may be retained on the bottle and repeatedly opened and closed but, as a practical matter, it may be torn off since its main function of keeping the dispensing opening and spout portion clean during storage and transportation, has served when the bottle reaches the ultimate purchaser and user.

Changes in the described structure may be made without departing from the invention.

I claim:

1. A paper bottle embodying a plurality of side walls and top and bottom walls, said top wall comprising at least a pair of flaps which extend from the upper ends of a pair of said side walls into mutually lapping, adhesively united, face-to-face relationship, said top wall having a dispensing opening adapted to be closed by a plug, said top wall being also provided around said opening with a ledge portion offset downwardly from the plane of said top wall and, from said ledge portion to the side wall of the bottle, with a portion also offset downwardly from the plane of said top wall to form a pouring spout, there being also another flap which extends from the upper end of another side wall into overlying relation to said top wall, said other flap being provided with lines of severance defining an ear which is displaceable from, but hingedly connected to said other flap, said ear being so shaped and located as to overlie said opening, said ledge, said pouring spout, and a portion of said top wall beyond said downwardly offset portions, said other flap, excepting said ear, being adhesively united in face-to-face relation to said top wall.

2. A paper bottle embodying a plurality of side

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walls and top and bottom walls, said top wall comprising at least a pair of flaps which extend from the upper ends of a pair of said side walls into mutually lapping, adhesively united, face-to-face relationship, said top wall having a dispensing opening adapted to be closed by a plug, said top wall being also provided around said opening with a ledge portion offset downwardly from the plane of said top wall and, from said ledge portion to the side wall of the bottle, with a portion also offset downwardly from the plane of said top wall to form a pouring spout, there being also another flap which extends from the upper end of another side wall into overlying relation to said top wall, said other flap being provided with lines of severance defining an ear which is displaceable from, but hingedly connected to said other flap, said ear being so shaped and located as to overlie said opening, said ledge, said pouring spout, and a portion of said top wall beyond said downwardly offset portions, said other flap, excepting said ear, being adhesively united in face-to-face relation to said top wall, said ledge portion being offset downwardly sufficiently to provide space between the top surface thereof and the inner surface of said ear when in closed position to receive an upwardly projecting portion of a plug seated in said opening.

3. A paper bottle comprising a plurality of side walls and top and bottom walls, said top wall comprising at least a pair of flaps which extend from the upper ends of a pair of said side walls into mutually lapping, adhesively united, face-to-face relationship, said top wall having a dispensing opening therein and being provided around said opening with a ledge portion offset downwardly from the plane of said top wall and, from said ledge portion to an adjacent corner portion of the bottle, with a portion also offset downwardly from the plane of said top wall to form a pouring spout, there being also another flap which extends from the upper end of another side wall into overlying relation to said top wall, said other flap being provided with lines of severance defining an ear which is displaceable from, but hingedly connected to said other flap, said ear being so shaped and located as to overlie said ledge, said pouring spout, and a portion of said top wall beyond said downwardly offset portions, said other flap, excepting said ear, being adhesively united in face-to-face relation to said top wall, and a plug seated in said opening and having an outwardly extending peripheral flange overlying said ledge portion, the latter being offset downwardly sufficiently to provide space for receiving said peripheral flange between said ledge and ear.

4. A paper bottle embodying a plurality of side walls and top and bottom walls, said top wall comprising a flap which extends from the upper end of one of said side walls, said top wall having a dispensing opening adapted to be closed by a plug, said top wall being also provided around said opening with a ledge portion offset downwardly from the plane of said top wall and, from said ledge portion to the side wall of the bottle, with a portion also offset downwardly from the plane of said top wall to form a pouring spout, there being also another flap which extends from the upper end of another side wall into overlying relation to said top wall, said other flap being provided with lines of severance defining an ear which is displaceable from, but

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hingedly connected to said other flap, said ear being so shaped and located as to overlie said opening, said ledge, said pouring spout, and a portion of said top wall beyond said downwardly offset portions, said other flap, excepting said ear, being adhesively united in face-to-face relation to said top wall.

5. A paper bottle embodying a plurality of side walls and top and bottom walls, said top wall comprising a flap which extends from the upper end of one of said side walls, said flap being provided with a portion offset downwardly from the normal plane of said flap, and said downwardly offset portion being apertured to provide a dispensing opening in said downwardly offset portion, said downwardly offset portion being sufficiently larger than said opening so as to provide an annular ledge portion around said opening, a stopper removably seated in said opening and having an outwardly extending peripheral flange overlapping said annular ledge portion, and a second flap extending from the upper end of another side wall into overlapping relation to said first mentioned flap, said second flap being provided with lines of severance defining an ear which is displaceable from said second flap to afford access to said dispensing opening and stopper, said ear being so shaped and located as to overlie said stopper and its peripheral flange, and said second flap, excepting said ear, being adhesively united in face-to-face relation to said first mentioned flap, the downwardly offset position of said apertured flap portion serving to provide space between said flaps for receiving said stopper flange whereby adhesive interattachment of said flaps as aforesaid, and maintenance thereof, is facilitated.

6. A paper bottle comprising a plurality of side walls and top and bottom walls, said top wall comprising a pair of flaps which extend from

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the upper ends of a pair of said side walls into mutually lapping, face-to-face relationship, one of said flaps being provided with a portion offset downwardly from the normal plane of said flap, and said downwardly offset portion being apertured to provide a dispensing opening in said flap, the other of said flaps overlapping said apertured flap and being provided with lines of severance defining an ear which is displaceable from said other flap and which is so shaped and located as to overlie the entire area of said dispensing opening and at least a narrow margin of said downwardly offset portion around said dispensing opening, said other flap, except said ear, being adhesively united in face-to-face relation to said apertured flap, the downwardly offset position of said apertured flap portion serving to provide space between said flaps for receiving a portion of a stopper which may be seated in said dispensing opening whereby adhesive interattachment of said flaps as aforesaid, and maintenance thereof, is facilitated.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,290,504	Sullivan	July 21, 1942
2,290,185	Hinkle	July 21, 1942
2,201,177	Hothersall	May 21, 1940
1,969,009	Hutt et al.	Aug. 7, 1934
1,746,006	Metzger	Feb. 4, 1930
1,247,237	Doble	Nov. 20, 1917
2,272,203	Hothersall	Feb. 10, 1942
1,272,080	Norton	July 9, 1918
1,079,394	Carey	Nov. 25, 1913
1,308,883	Weis	July 8, 1919