

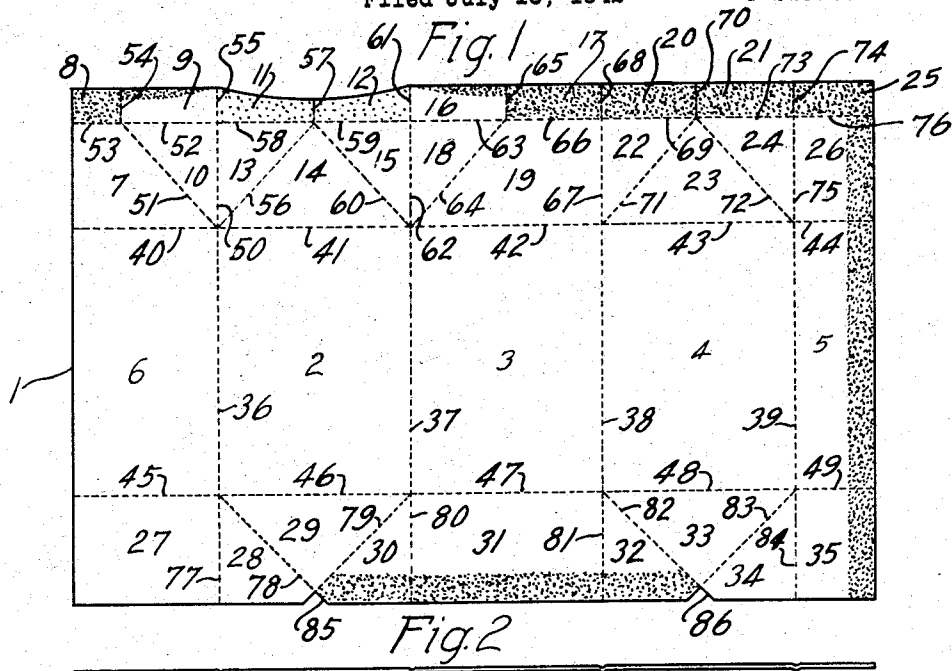
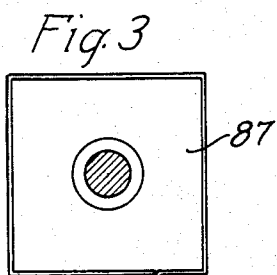
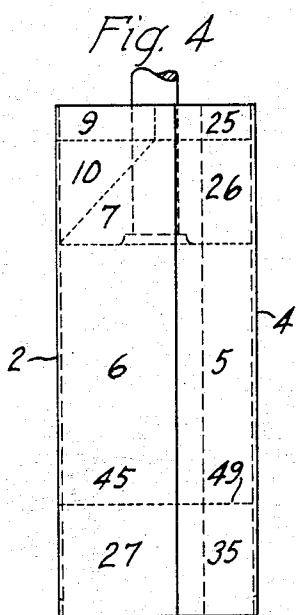
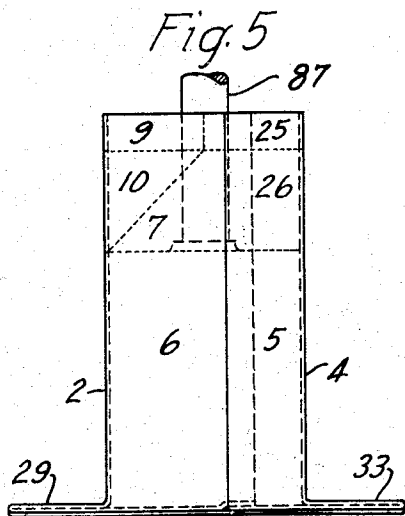
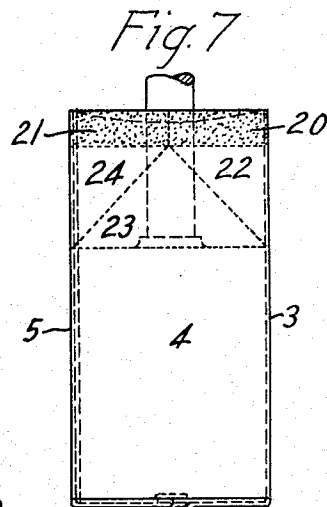
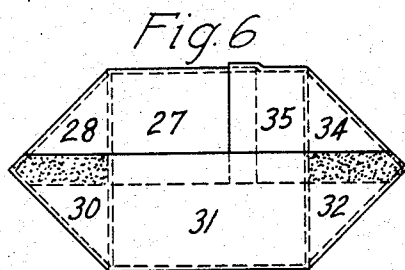
Nov. 14, 1944.

M. H. SIDEBOTHAM
PAPER CONTAINER FOR FLUID

2,362,862

Filed July 15, 1942

3 Sheets-Sheet 1



Inventor,
Melvin H. Sidebotham,
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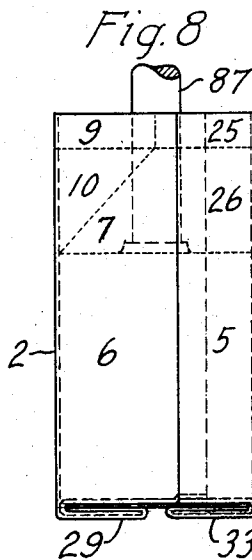
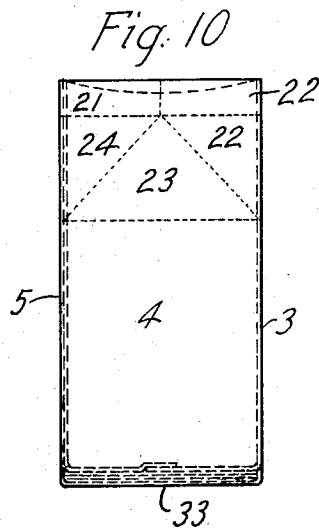
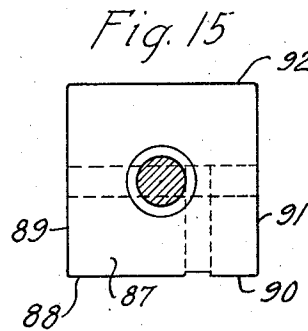
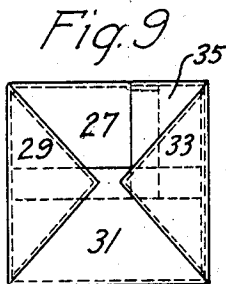
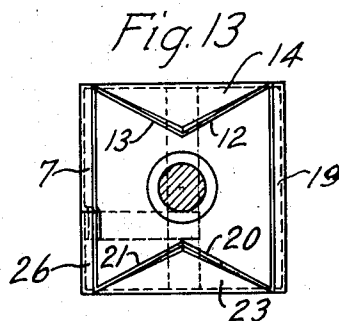
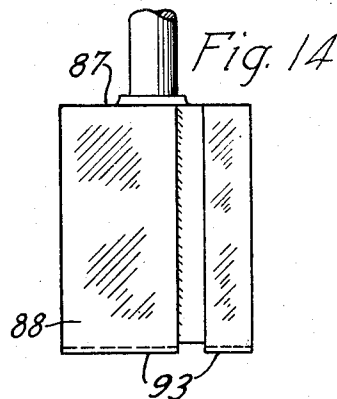
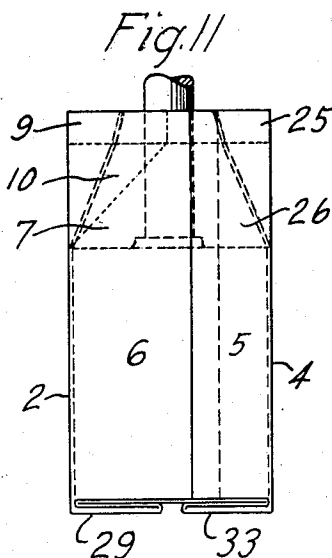
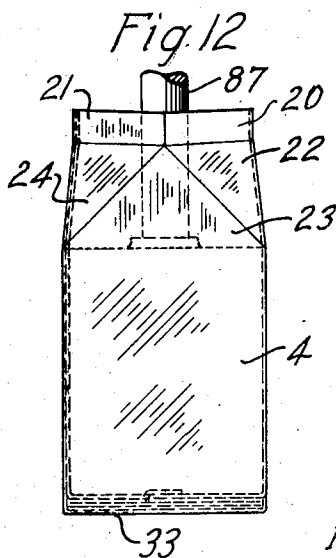
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2,362,862

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3 Sheets-Sheet 2



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PAPER CONTAINER FOR FLUID

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3 Sheets-Sheet 3

Fig. 17

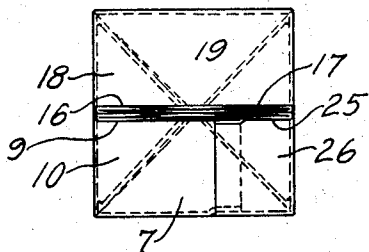


Fig. 16

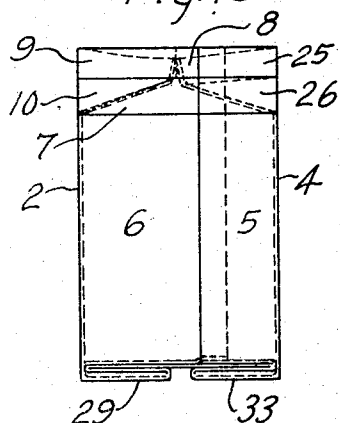


Fig. 18

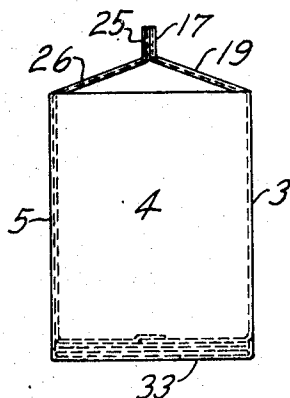


Fig. 19

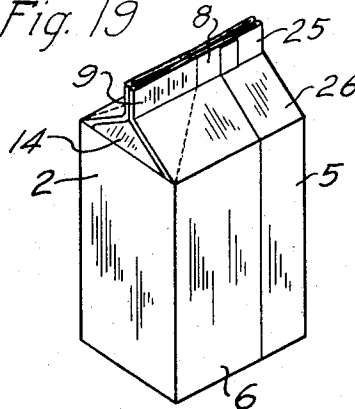


Fig. 20

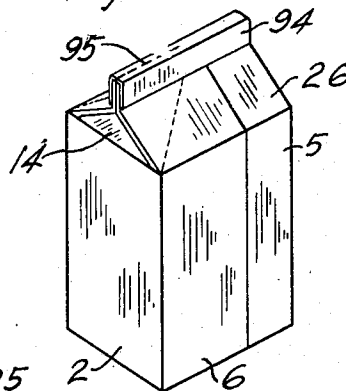


Fig. 21

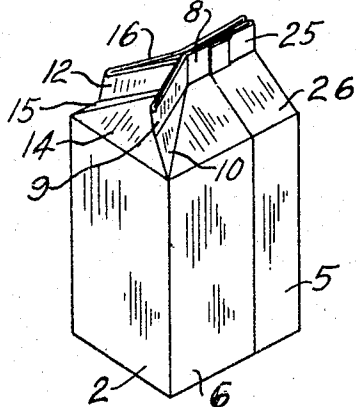


Fig. 22

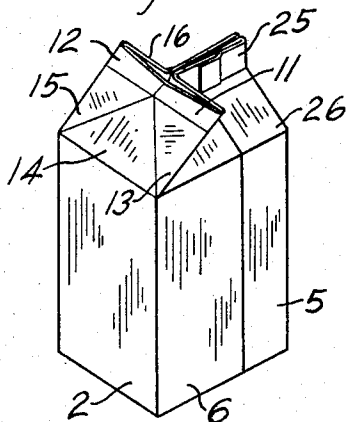
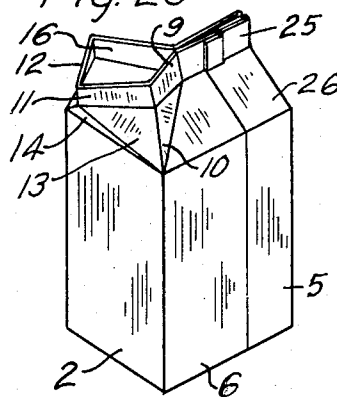


Fig. 23



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UNITED STATES PATENT OFFICE

2,362,862

PAPER CONTAINER FOR FLUID

Melvin H. Sidebotham, Newton, Mass., assignor of
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Application July 15, 1942, Serial No. 451,028

5 Claims. (Cl. 229—37)

My invention relates to paper receptacles and the manufacture thereof, and has particular reference to the production of liquid tight, thermoplastically treated receptacles for handling measured quantities of fluid, such as milk, to provide economical substitutes for the glass bottles and metal cans usually employed. It is to be understood, however, that my improved containers may be employed for packaging oil, ground salt, flour and other easy flowing substances.

There is an ever increasing demand for improved liquid tight containers for use in dairies for packaging milk and cream. I am aware that many types of paper containers are now in use for packaging liquids. The present invention, however, overcomes many of the objections to the paper containers now in use, by presenting an improved method for fabricating containers, and an improved method for heat sealing container joints.

Heretofore, so far as I am aware, the most common practice in effecting the production of paper containers for holding liquids, has been to first form a flat paper container blank provided with the necessary cuts and creases. The flat blanks are then folded, and the longitudinal joint glued to form a container in flat, tubular form. The flat, folded container blanks are then shipped to the filling plant where they are opened up to tubular condition. The bottom closure of each container is formed by folding and gluing integral bottom flaps. The container is next treated with paraffin on both the inside and outside surfaces. The paraffin coated container is thereafter filled with the commodity to be packaged. The top closure of the container is usually formed by folding together opposite side walls and inserting a metal staple or clip to hold the folded side walls in position.

The above described practice heretofore in use for providing liquid tight paper containers is so expensive that progress in the use of paper containers for packaging liquids has been retarded.

In the preferred embodiment of my invention the container blanks are cut and creased to provide the required container elements. All surfaces of the blank are thereafter coated with a quick-drying, thermoplastic material of the type that will form a liquid-tight film, and have adhesive qualities when heated. The cut, creased and thermoplastically treated container blanks are sent to the filling plant, where the containers are formed in set-up condition from

the prepared blanks, and the containers filled and closed. All joints of the container being sealed by the application of heat and pressure. This method provides for more economical fabrication, by eliminating operations previously considered necessary.

One object of my invention is to provide a liquid tight, thermoplastically treated container that may be fabricated in set up condition by automatic machinery, operating in conjunction with filling machinery and top closing machinery.

Another object of my invention is to provide an improved paper container so designed that the joints thereof may be heat sealed by simple operations.

Another object of my invention is to provide a paper container designed so that a pouring spout may be easily formed from part of the top closure of the container.

Another object of my invention is to provide a liquid tight container using a minimum of paper material.

Still another object of my invention is to provide an improved method for fabricating liquid tight containers from flat, thermoplastically treated blanks. The said method includes a manner of fabricating containers whereby heavy pressure may be applied to the joints thereof for sealing purposes.

With said objects in view, and others herein-after explained, my invention consists in the container and method of making the same, substantially as hereinafter described and claimed.

Of the accompanying drawings:

Figure 1 is a plan view of the container blank from which my improved package is formed.

Figure 2 is an edge view of Figure 1.

Figure 3 is a plan view showing the container blank formed around a former block to provide a square tubular enclosure.

Figure 4 is an elevation of the container blank formed to square tubular condition.

Figure 5 is a front elevation showing the condition of the container after the first bottom closing operation has been completed.

Figure 6 is a bottom view of Figure 5.

Figure 7 is a side elevation of Figure 5.

Figure 8 is a front elevation showing the condition of the container after the completion of the bottom forming operation.

Figure 9 is a bottom view of Figure 8.

Figure 10 is a side elevation of Figure 8.

Figure 11 is a front elevation illustrating the condition of the container after the top closure

portion of the container has been partially folded on the creased lines to break the creases to render less difficult the operation for forming the top closure.

Figure 12 is a side elevation of Figure 11.

Figure 13 is a top view of Figure 12.

Figure 14 is a front elevation of the former block about which the container blank is wrapped in fabricating the container.

Figure 15 is a top view of Figure 14.

Figure 16 is a front elevation of the completed container, after the former block has been removed and the container filled with the commodity to be packaged, and the top closure formed and sealed.

Figure 17 is a top view of Figure 16.

Figure 18 is a side elevation of Figure 16.

Figure 19 is a perspective view of the completed container.

Figure 20 is a perspective view of a modified form of my invention, showing a paper seal positioned over the top portion of the closure.

Figure 21 is a perspective view of the container shown in Figure 19, after part of the top closure seal has been broken in the first operation for opening the container and forming the pouring spout.

Figure 22 is a perspective view illustrating the condition of the container after the completion of the second step of the operation for opening the top closure and forming the pouring spout.

Figure 23 is a perspective view showing the container after the completion of the third and last step of the operation for opening the closure and forming the pouring spout.

Similar reference characters indicate similar parts or features in all of the views.

The container is fabricated from a rectangular blank 1, (Fig. 1) made of suitably stiff paper or fibre board. As illustrated in Figure 1, the paper blank 1 is creased on lines represented by dotted lines 36 to 84 inclusive. The said dotted creased lines effect a division of the blank to provide side wall sections 2 to 6 inclusive; top closure sections 7 to 26 inclusive; and bottom closure sections 27 to 35 inclusive.

Small triangular portions of the blank are removed at 85 and 86 to facilitate the formation of the bottom closure. A portion of sections 11 and 12 of the top closure is removed in order that the lip of the pouring spout may be positioned below the top edge of the container when it is in set-up condition.

In the preferred method of fabricating my improved container, the entire blank, after it has been cut and creased, is coated with a thermoplastic material that will dry quickly to a smooth, hard finish. The thermoplastic material must be of the type that will form a liquid tight film when applied to paperboard, and also have the quality to securely seal together overlapping sections of paperboard having such a thermoplastic film thereon, when heat and pressure is applied to firmly press the said overlapping sections together.

For some purposes it is not necessary to have a coating of thermoplastic material over the entire blank. In making containers for such purposes, only the areas which are to be sealed are coated with thermoplastic material. Figure 1 shows the surfaces to which a coating of thermoplastic is applied when making a container that does not require a thermoplastic coating over all areas of the container. Portions of sections of the blank marked 8, 9, 16, 17, 26, 5, 31 and 35 are

treated with thermoplastic material only on the upward facing surface of the blank shown in Figure 1. Sections 11 and 12 are treated with thermoplastic only on the underside thereof, and sections 20, 21, 30 and 32 are thermoplastically treated on both sides.

The following described method for producing my improved container applies to blanks having only the joint areas coated with thermoplastic material, as well as to blanks having all areas thereof thermoplastically treated.

In the first step of the method for fabricating the container, the cut, creased and thermoplastically treated blank is positioned with the wall section 6 of the blank against surface 88 of the former block 87. The blank is then wrapped around the said former block with the result that the margin of wall section 5 will overlie the corresponding margin of wall section 6.

The overlapped margins of wall sections 5 and 6 are then subjected to the application of heat and pressure, with the result that the thermoplastic coating on wall section 5 will become sufficiently tacky to adhesively seal together the said overlapped margins; thus the blank is formed to square tubular condition.

The next step of the method for forming the container, consists in folding inwardly bottom sections 27 and 35 against the bottom surfaces 93 of the former block 87. The folding of bottom sections 27 and 35 will cause bottom end sections 28 to be folded against side wall extension section 29, and blank section 34 to be folded against side wall extension section 33. The bottom overlapped section 31 is then folded inwardly against the surfaces 93 of the former block 87. Thus the thermoplastically treated margin of the bottom overlapped section 31 is positioned to overlap the margins of bottom sections 27 and 35. The folding of the said section 31 serves to draw the bottom end section 32 against the side wall extension section 33, with the thermoplastically treated margin of said section 32 overlapping the corresponding margin of bottom end section 34. In the same manner bottom end section 30 is drawn against end wall extension section 29, with the thermoplastically treated margin of bottom end section 30 overlapping the corresponding margin of bottom end section 28. The blank is at this stage of fabrication in the condition illustrated by Figures 5, 6 and 7.

The next step of the method consists in applying heat, and pressure to firmly press the thermoplastically treated margins of the sections 30, 31 and 32 firmly against the corresponding margins of sections 28, 27, 35 and 34. The application of heat serves to make adhesive the thermoplastic coating on the blank sections, and the application of pressure serves to render the adhesive effective for securely sealing together the overlapped margins.

The next step of the method consists in folding the integral unit, comprising sections 32, 34 and 33, to overlie sections 31 and 35. The integral unit comprising sections 28, 30 and 29 is folded to overlie sections 27 and 31. Heat and pressure is then applied to cause the thermoplastic coating on the underside of sections 30 and 32 to secure the said two integral units in position against section 31. Thus the bottom closure is completed, with the container in the condition illustrated by Figures 8, 9 and 10.

The blank sections which comprise the top closure portion of the container, are next partially

folded on creased lines 40 to 44 inclusive, 52, 53, 56, 57, 58, 59, 60, 63, 66, 69, 70, 71, 72, 73 and 76 to break the creases, so that in the operation of closing the container, after it has been filled with the commodity to be packaged, there will be little resistance to the folding operation for closing the container. The container is at this stage in the condition illustrated by Figures 11, 12 and 13.

The former block 87 is then removed from the container. The container is next filled to the top of the side wall sections 2, 3, 4, 5 and 6 with the commodity to be packaged.

In the operation for closing the filled container, tuck section 14 is folded inwardly on creased line 41, thus drawing inwardly connecting sections 13 and 15 which in turn causes the lip sections 11 and 12 to form a bellow fold between top sealing sections 9 and 16. The folding action of tuck section 14 and connecting sections 13 and 15 will cause the top closure sections 7 and 19 to be drawn inwardly over the top of the container. Simultaneously with the folding inwardly of tuck section 14, a corresponding tuck section 23 on the opposite side of the container is folded inwardly on creased line 43, thus drawing inwardly, connecting sections 22 and 24 which in turn causes closure margin sections 20 and 21 to form a bellows fold between top sealing sections 8 and 25 and top sealing section 17. The folding action of tuck section 23 and connecting sections 22 and 24 causes the top closure sections 19 and 26 to be drawn inwardly. Heat and heavy pressure is applied to the outside surfaces of blank sections 16, 17, 8, 9 and 25. The heat and pressure serves to cause the thermoplastic coating on section 17 to seal said section 17 to the adjacent surface of section 20, and in the same manner sections 8 and 25 are secured to the adjacent surface of section 21. The contacting surfaces of sections 20 and 21 are secured by the heat and pressure applied to sections 8, 25 and 17. The heat and pressure applied to sections 9 and 16 serve to seal together the adjacent top margins of those sections. It will be observed that sections 11 and 12 are not sealed to the adjacent surfaces of sections 9 and 16. The contacting surfaces of sections 11 and 12 are sealed together by the thermoplastic material coated thereon. The application of heat serves to make the thermoplastic adhesive, and the pressure serves to render the thermoplastic effective for sealing together adjacent surfaces.

The filled and closed container is illustrated by Figures 17 to 19 inclusive. The packages as illustrated are in condition for shipment to customers.

When the user wishes to dispense the commodity from the package, the top closure is opened and a pouring spout formed from the top closure sections in the manner hereinafter described. A knife or other sharp implement is first inserted in the recess formed by tuck sections 14, and connecting sections 14 and 15. The knife is then forced upwardly between lip sections 11 and 12 to cut the seal securing those two sections together. The upward movement of the knife operates at the same time to cut the seal securing together the top margins of sealing sections 9 and 16. At this stage the container is in the condition illustrated by Figure 21. The next step in the operation for opening the container consists in separating and folding backward the two wings one of which formed by sections 9, 10, 11 and 13, and the other by sections 12, 15, 16 and 18. The said wings are folded back to bring the

upward facing surfaces of sections 11 and 12 slightly more than 180° apart. The container is at this stage, in the condition illustrated by Figure 22. The last operation consists in exerting pressure on the wings at creased lines 55 and 61. The said pressure is exerted first inwardly toward sections 8 and 17, and then outwardly toward wall section 2, with the result that sections 11, 12, 13 and 15 move out of contact with the respective sections 9, 16, 10 and 18 thus forming the said sections 9 to 15 inclusive, and sections 16 and 18 to provide a pouring spout for dispensing the commodity contained in the package, as illustrated by Figure 23.

Figure 20 illustrates a modified form of my invention. It is desirable for some purposes to provide the top closure with an added covering strip 94, in order to better seal the top closure, and to improve the appearance of the package. The covering strip may be made of paper, Cellophane, Pliofilm, or other suitable material. The said covering strip 94, when made of paper or other material that is not adhesive when heated, is secured to sections 8, 9, 25, 16 and 17 by thermoplastic material coated thereon; heat and pressure being applied to render the thermoplastic material effective. When the covering strip is made of material that becomes adhesive when heat is applied thereto, the coating of thermoplastic material may, of course, be omitted.

In the operation for opening the container having a covering strip 94 over the top closure, the said covering strip is cut on dash line 95 (Fig. 20) at the same time that the seals holding together sections 11 and 12, and 9 and 16 are cut as previously described.

Having now described my invention, I claim:

1. A rectangular blank for paper containers having crease lines and recesses fashioned therein, comprising, three longitudinal crease lines substantially parallel with opposite longitudinal margins, the first longitudinal crease line lying in close proximity to one of the longitudinal margins, the second longitudinal crease line defining the division between the top of side wall sections and the bottom of top closure sections; four parallel crease lines lying transversely of the blank and intersecting the longitudinal crease lines, the first, second, third and fourth transverse crease lines being spaced to define five wall sections, each having an integral top closure section at one end; a crease line extending diagonally from the intersection of the second longitudinal crease line with the first transverse crease line to a point on the first longitudinal crease line between the first transverse crease line and the adjacent transverse edge of the blank; a crease line extending from the adjacent longitudinal edge of the blank to the junction point of the crease line, last above described, with the first longitudinal crease line; a crease line extending diagonally from the intersection of the second longitudinal crease line with the first transverse crease line to a point on the first longitudinal crease line midway between the first and second transverse crease line; a creased line extending diagonally from the intersection of the second longitudinal crease line with the second transverse crease line to a point on the first longitudinal crease line midway between the first and second transverse crease lines; a crease line extending from the first longitudinal crease line at a point midway between the first and second transverse crease lines to the center of a recess at the adjacent edge of the blank between

the first and second transverse crease lines; a crease line extending diagonally from the intersection of the second longitudinal crease line with the second transverse crease line to a point on the first longitudinal crease line midway between the second and third transverse crease lines; a crease line extending from a point on the first longitudinal crease line, midway between the second and third transverse crease lines, to the adjacent edge of the blank; a crease line extending diagonally from the intersection of the second longitudinal crease line with the third transverse creased line to a point on the first longitudinal crease line midway between the third and fourth transverse crease lines; a crease line extending diagonally from the intersection of the second longitudinal crease line with the fourth transverse crease line to a point on the first longitudinal crease line midway between the third and fourth transverse crease lines; a crease line extending from a midpoint on the first longitudinal creased line, between the third and fourth transverse crease line, to the adjacent edge of the blank.

2. A container blank as described in claim 1, having all surfaces coated with a water resistant, thermoplastic material that becomes adhesive

when subjected to heat at moderately high temperature.

3. A container blank as described in claim 1, having predetermined joint areas coated with thermoplastic material that becomes adhesive when subjected to heat at moderately high temperature.

4. A container blank as described in claim 1, having predetermined areas coated with water resistant, thermoplastic material that becomes adhesive when subjected to heat at moderately high temperature.

5. A container made from a blank such as is described in claim 1, comprising, side walls; a bottom closure; and a top closure having two tuck sections extending inwardly from opposite side walls, two connection sections connecting each tuck section with overlying top closure sections, lip sections adhesively secured together and being integral with the corresponding connection sections, closure margin sections secured together and being integral with corresponding connection sections, two top sealing sections adhesively secured together at their topmost margins and also adhesively secured to the closure margin sections.

MELVIN H. SIDEBOTHAM.