May 26, 1925. 1,539,677

E. W. LABOMBARDE

LEAK TIGHT FOLDED BOX

Filed July 12, 1924

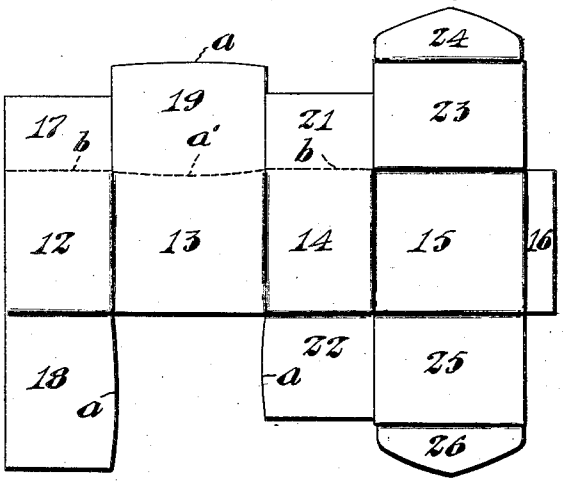

Fig.1.

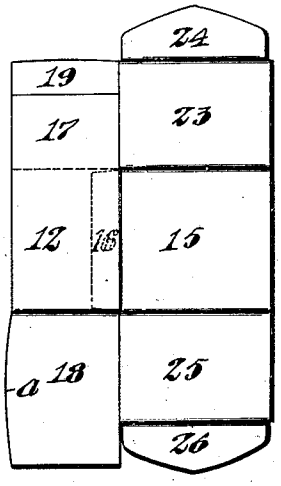

Fig.2.

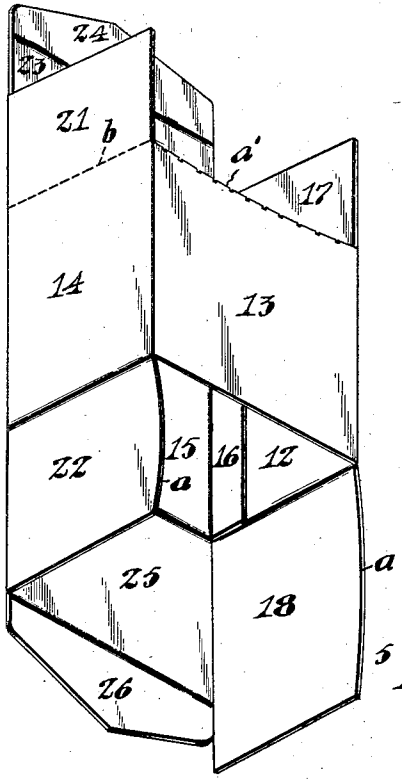

Fig.4.

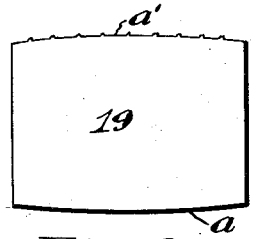

Fig.3.

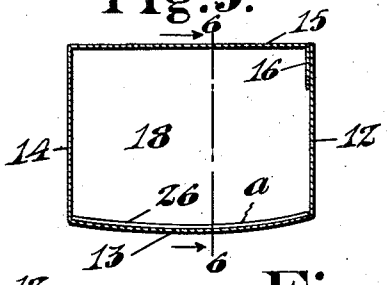

Fig.5.

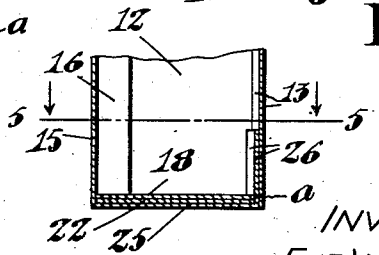

Fig.6.

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UNITED STATES PATENT OFFICE.

ELIE W. LABOMBARDE, OF NASHUA, NEW HAMPSHIRE.

LEAK-TIGHT FOLDED BOX.

Application filed July 12, 1924. Serial No. 725,542.

To all whom it may concern:

Be it known that I, ELIE W. LABOMBARDE, a citizen of the United States, and resident of Nashua, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Leak-Tight Folded Boxes, of which the following is a specification.

This invention relates to the manufacture of paper boxes and has particular reference to the production of containers which, although made in the form of flat folded boxes, are capable of holding soft, or semi-liquid, or frozen goods such as ice cream, without permitting such goods to leak therefrom.

As explained in my application filed January 16, 1924, Serial No. 686,511, of which application the present one is, to some extent, a continuation, paper or pasteboard boxes or pails most commonly used at present, especially those which are filled in stores and carried home by individual customers, are of tapering shape so they may be nested for the purpose of saving space when they are shipped or stored. Boxes of such shape can not be made otherwise than partly or wholly by hand, or by very expensive machines which are slow in production. And it is essential that boxes which are to be used for carrying ice cream from a store to one's home shall have bottoms and side walls as leak-proof as possible. To attain the best results in this respect, it has been necessary heretofore to make the boxes in open or set up condition with their bottom flaps adhesively secured. Therefore they could not be made in flat folded condition and so shipped or stored. And this is true whether they are of tapering form or are of uniform diameter from end to end.

The principal object of my present invention is to provide boxes suitable for containing ice cream or other substances, which boxes can be made in flat-folded condition by high-speed automatic machines, shipped or stored in such flat-folded condition, and can be converted to open or set up condition as wanted, and yet be practically leak-proof, without requiring the addition of anything to seal the bottom flaps.

In carrying out my invention I preferably provide blanks each of which, when died out, carries a section that is readily detachable therefrom but which remains attached during the folding of the blank to flat-folded condition and also until the flat-folded box is to be opened or set up for use at which time said section is detached and fitted inside the box to strengthen the bottom of the box and furnish additional means coacting with foldable flaps to make the box leak-proof, said section being later usable as an ejector for the contents of the box.

Blanks such as described are foldable on two parallel lines and, therefore, can be converted to flat folded boxes and completed by machines of the continuous or rotary type such as illustrated in Letters Patent No. 1,096,633, granted to me May 12, 1914, such machines being capable of operating at a productive speed of more than 50,000 an hour.

Of the accompanying drawings:—

Figure 1 is a plan view of one form of blank for making one of my improved boxes.

Figure 2 is a plan view of a similar blank in its flat-folded condition ready to be set up to container form.

Figure 3 is a plan view of the detachable section.

Figure 4 is a perspective view of the box in partly set up condition.

Figure 5 represents a transverse section of a completely set up box, on line 5—5 of Figure 6.

Figure 6 represents a vertical section on line 6—6 of Figure 5.

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

Referring first to Figure 1, the blank, which will be of such size and be so proportioned as to best suit the quantity and kind of material or goods to be carried in the completed box, is cut and creased to provide wall sections 12, 13, 14, 15, the latter having an edge flap 16. The section 12 has flaps 17, 18, and the section 13 has a section 19 separably connected to it by a curved perforated line a'. The section 14 has flaps 21, 22, and the section 15 has a flap 23 provided with a tucking flap 24 and a flap 25 provided with a tucking flap 26.

One edge of each of the flaps 18, 22, is curved as indicated at a, the curvature being somewhat exaggerated in the interest of clearness of illustration, the purpose of

the curvature being explained hereinafter. For a reason also explained hereinafter, it is sometimes desirable that the flaps 17, 21, may be readily detached. For this purpose lines of perforations *b* coincide with the crease lines on which said flaps are to be folded.

The blanks are, preferably, and while flat, first printed in any suitable manner and then paraffined or waxed to provide a high-gloss finish in a manner such as explained in my application filed March 2, 1922, Serial No. 540,604.

When the blanks are folded to the condition illustrated by Figure 2, they are so operated upon that the edge flap 16 of each, which is at one end of the row of four wall sections, is adhesively secured to the inner surface of the margin of section 12 at the other end of said row. If the blanks are waxed before folding, the adhesion just referred to will be rendered more durable either by omitting wax from the surfaces which are to be glued together, or by driving it in, or by removing it from said surfaces.

In most if not all stores there are quiet periods when a clerk, or clerks, can use the time to set up a number of the flat boxes to open or goods-receiving condition, to be ready for customers. When a flat box is to be so converted, the section 19 is first detached and the four wall sections squared up to the condition illustrated by Figure 4. At this point it is to be understood that flaps 17, 21, 23, are the top or cover flaps, and that the flaps 18, 22, 25, are the bottom flaps. And it is especially pointed out that the width of flap 18 is exactly equal to the width of the wall sections 12, 14, and the length of said flap 18 is exactly equal to the width of the wall sections 13, 15. In other words, the flap 18, which is the inner or upper of the overlapping bottom flaps when the box is ready to receive goods, is coextensive in area with the transverse area of the bottom of the box.

When the box is in the condition illustrated by Figure 4 the flap 18 is first folded up or swung against the lower edges of the wall sections, then the flap 22 is folded up against the lower surface of the flap 18, and then the flap 25 is folded up and its narrow flap 26 is tucked past the edges of the flaps 22, 18, as illustrated by Figures 5 and 6. Owing to the area of the flap 18 as hereinbefore described, two of its edges meet the angles of fold of the flaps 22, 25, and of course there can be no leakage past its own angle of fold. And its edge past which the flap 26 is tucked is practically caulked by that tucking flap.

While I do not limit myself to curving the edges of the flaps 18, 22, as illustrated at *a*, I prefer to do so for the following reason:—Some goods, such as ice cream, when packed into such a box, have a tendency to press out or bulge the lower portion of the wall which has no connected or integral folded flap, and such goods also sometimes gets down behind the tucking flap 26, and leak past it. By curving an edge *a* of either or both of the flaps 18, 22, compensation is provided for the bulging of the wall 13, and the tucking flap 26 is pressed tightly against the inner surface of said wall 13, serving also to bind or lock the tucking flap 26 so tightly that the weight of the contents of the box pressing down on the inner flap 18 can not open any crevices at the bottom.

To compensate for the bottom bulging just referred to, and to bind the tucking flap so that no bottom crevice will exist, the said edge *a* is curved from end to end.

After the box has been filled, the top or cover flaps 17, 21, 23, may be folded down in the order named, or otherwise, and the narrow flap 24 tucked in. The reason for providing the perforated lines *b* is to facilitate the removal of the flaps 17, 21, when the box is to be emptied.

In Figures 5 and 6 the section 19 is not illustrated, partly for the reason that its presence in those figures would tend to impair the illustration of the close fitting of the flap 18, and partly because I do not limit myself to boxes having such sections 19. When the sections 19 are employed, however, they serve two purposes, viz: to reinforce the bottom and aid in binding the tucking flap 26 in position, and to serve as an ejecting pusher when the box is to be emptied. When a blank has the detachable section 19, it is removed and after the bottom flaps have been folded up as hereinbefore described, it is inserted flat against the upper or inner surface of the flap 18. Its curved edges *a a'* compensate for any outward bulging of the lower portions of the walls of the box, and when used as a pusher, the said curved edges leave little or none of the contents sticking to the walls. When the section is to be so used, it is best to lay the box on one side, on a suitable serving dish or plate, with the top flaps 17, 21, removed, and the flap 23 wide open or removed, and then a person can, by simply pushing against the section 19 (after opening the bottom flaps) cause the said section 19 to act as an ejector smoothly removing the contents as a block which can then be cut into slices on the plate.

Having now described my invention, I claim:—

1. A foldable box blank cut and creased to provide four wall sections with foldable bottom and top flaps, said blank having an integral but separable section having an area and adapted and intended to closely fit the inside of the box when said blank is

folded and set up to box form, and to be freely pushed through the box, said separable section having curved edges.

2. A paper box having interfolded bottom members including a flap tucked inside against one of the walls of the box, and a separate combined plunger and locking member fitting the inside of the box close to said bottom members and having a curved edge bearing against the tucked flap.

3. A paper box having interfolded bottom members one of which has a flap tucked upwardly against the inside of one of the walls of the box, another of said bottom members having an edge bearing against the said upwardly tucked flap, said bearing edge being curved from end to end.

In testimony whereof I have affixed my signature.

ELIE W. LABOMBARDE.