Oct. 19, 1954 F. LANGE 2,692,078

BOX

Filed May 19, 1950 2 Sheets-Sheet 1

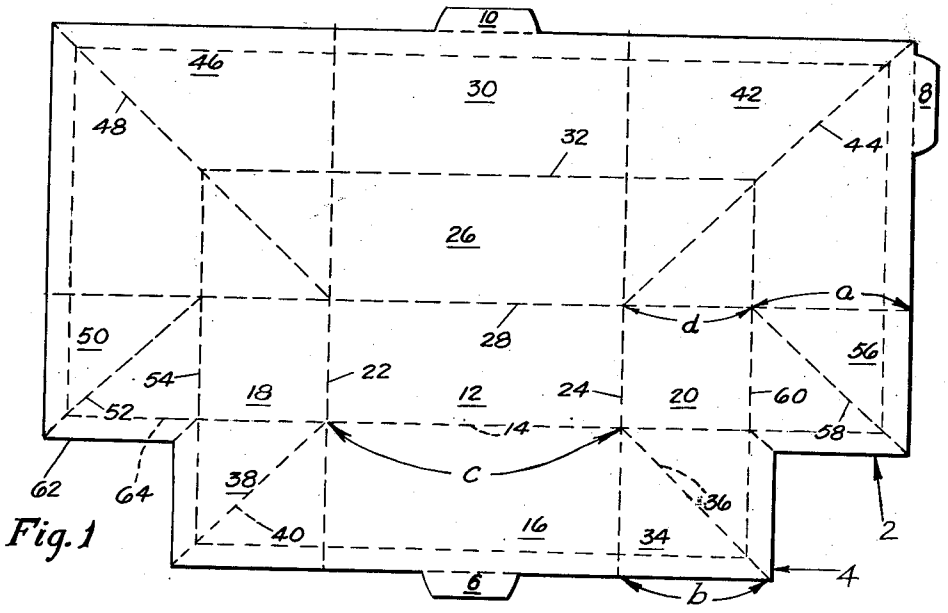


Fig. 1

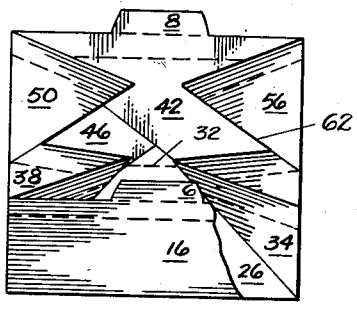


Fig. 2

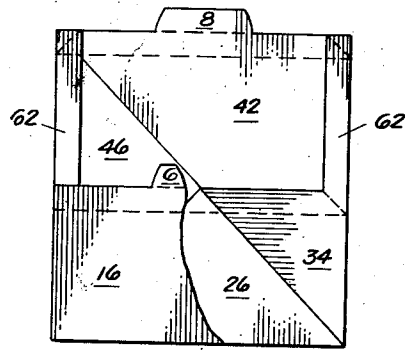


Fig. 3

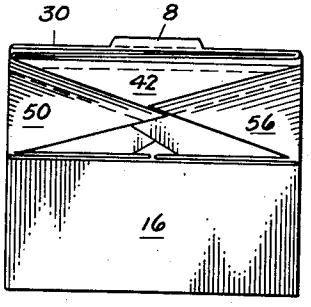


Fig. 4

INVENTOR.
Ferdinand Lange
BY
Bailey, Stephens & Huettig
ATTORNEYS

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BOX

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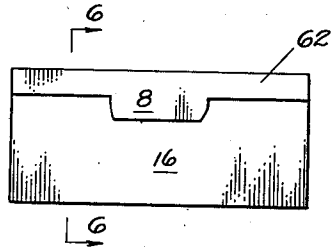


Fig. 5

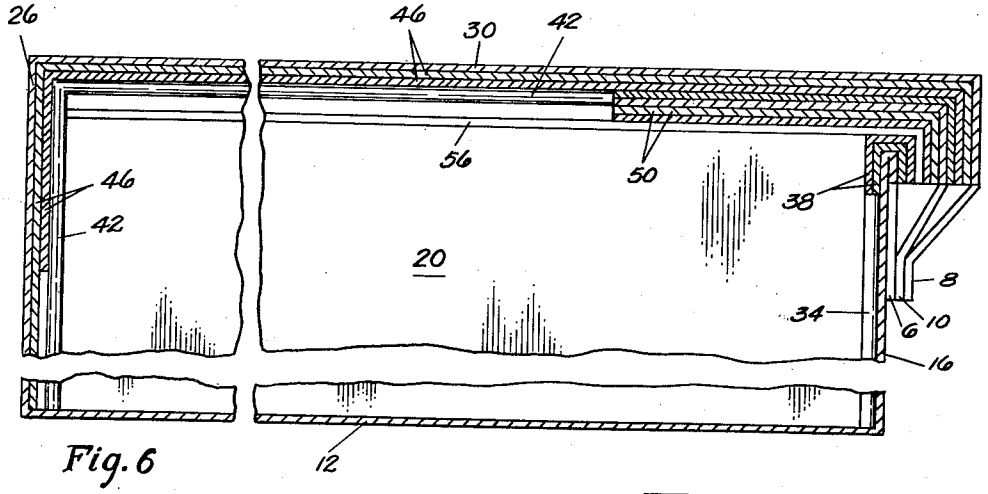


Fig. 6

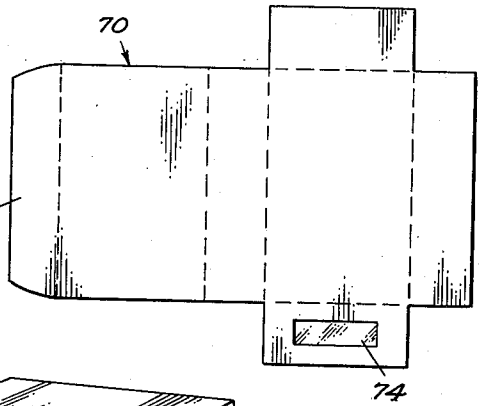


Fig. 7

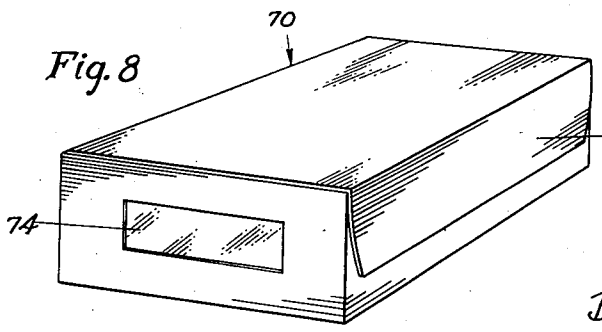


Fig. 8

INVENTOR.
Ferdinand Lange
BY
Bailey, Stephens & Huettig
ATTORNEYS

Patented Oct. 19, 1954

2,692,078

UNITED STATES PATENT OFFICE

2,692,078

BOX

Ferdinand Lange, Minden in Westphalia, Germany, assignor to Werner Bahlsen, Hannover, Germany

Application May 19, 1950, Serial No. 162,844

Claims priority, application Germany July 22, 1949

1 Claim. (Cl. 229—16)

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This invention relates to a box made of paper, metal foil, regenerated cellulose, and similar materials. In particular the invention relates to a box formed by folding a single piece of material so that all the edges of the box, except a single closure edge, are solid bends of the material.

Containers are known which are folded from a blank and include triangular folds to form some of the sides and the lid of the container. In all known constructions, however, at least some of the sides of the container are composed of overlapping portions of the material having free edges. Thus, in addition to the closure edge for the box lid, the container is pervious to moisture which can penetrate between the free edged overlapped portions. Satchel, purse, or bag-like structures are known in which the sides are folded so that the container has the free ends of the material along a single marginal closing edge. Such structures are not flat bottomed boxes useful for packaging candy, cigarettes, and like goods.

An object of the invention is to construct a folded box having no free edges except those at the closing edge between the box lid and a side edge of the box. A further object of the invention is to construct a flat bottom rectangular box from a single piece of material folded so that all edges except the closing edge for the lid are composed of solid unbroken folds of the material. Other objects of the invention are to produce a folded box substantially moisture impervious at its seams, and having a readily severable sealing edge, and to produce a wrapper for the box, said wrapper including a transparent window.

In general, these objects are accomplished by folding a substantially rectangular piece of material so that the front side and back side of the box are joined to the ends of the box by inwardly folded triangular pleats. The back side of the box, including the pleats, is extended into a box lid which in turn is connected to the box ends by triangular pleats. By reason of this folding, all the free edges of the material are brought together in overlapping relation at the upper edge of the front side of the box. All other edges of the box are formed and connected by solid unbroken bends in the material, there being no free material ends past which moisture can seep. The overlapped margins are bent downwardly and secured against the front side of the box. If the box is made of transparent material, a reinforcing and/or decorative wrapper can be provided, said wrapper having a

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window at a position where the contents of the box can be seen between the folded material.

The means by which the objects of the invention are obtained are set forth more fully with reference to the accompanying drawings, in which:

Figure 1 is a blank of material cut to be folded into the box, the fold lines being indicated thereon;

Figure 2 is a front view of the box partially folded;

Figure 3 is a front view of the box folded and open;

Figure 4 is a front view of the box with the lid partially closed;

Figure 5 is a front view of the box closed and sealed;

Figure 6 is an enlarged cross-sectional view on the line 6—6, Figure 5;

Figure 7 is a plan view of the wrapper for the box; and

Figure 8 is a perspective view of the box enclosed in the wrapper.

In Figure 1, box blank 2 is substantially rectangular in shape except for a projection 4 on one side thereof, and tabs 6, 8 and 10 respectively. Panel 12 forms the rectangular bottom for the box, and is connected on fold line 14 to panel 16 which is the front side for the box. The two similar end panels 18 and 20 are joined at fold lines 22 and 24 to panel 12. Panel 26 joined by fold line 28 to panel 12 forms the back side of the box, and panel 30 connected to panel 26 on fold line 32, is the box lid.

The corner between front panel 16 and side panel 20 is filled by panel 34 which is divided by fold line 36 into a triangular pleat. Similarly panels 16 and 18 are connected by panel 38 having fold line 40.

Likewise, the corner between panels 20 and 26 is filled by a panel 42 coextensive with one side of panel 30, said panel 42 having fold line 44 in order to form a pleat, and panels 18 and 26 are joined by panel 46 having pleat fold line 48.

Side panel 18 is extended into a pleat forming panel 50 having pleat fold line 52, and joined to panel 18 at fold line 54. The opposite end of the box blank similarly has panel 56 with pleat fold line 58, and fold line 60 between panels 20 and 56.

Fold line 14 is common to panels 50, 18, 38, 12, 16, 20, 34, and 56. Fold line 28 is common to panels 46, 50, 26, 12, 42, 20, and 56. Fold line 22 is common to panels 46, 30, 26, 18, 12, 38 and 16. Fold line 24 is common to panels 30, 42, 26, 12, 20, 16, and 34. It is noted that fold line 58 lies diagonally of rectangular panel 56 and is per-

pendicular to fold line 44, and that fold line 36 is parallel to fold line 58. The same relationship holds for the corresponding fold lines on the opposite side of the box.

Blank 2 has a margin 62 extending around the periphery of the blank and defined by fold line 64 of similar extent. Finally, tabs 6, 8 and 10 are joined to margin 62.

In order that the various pleats will not be too large, and will stay within the confines of the folded box, and yet at the same time bring the marginal free edges together so no moisture pervious opening exists, the following proportions must be observed: the distance *a* plus *b* must be greater than the length *c*, and the distance *a* plus *d* must be smaller than the length *c*. In other words, the distance from one end of the fold line forming a longitudinal edge of the box to the outer edge of said blank, plus the width of said margin, must be greater than the length of the longitudinal edge, and said distance alone must be less than the length of the edge.

The assembling of the box is shown in Figures 2 to 6. First, note Figure 2, the blank 2 is bent on fold lines 22 and 24 so side panels 18 and 20 are brought into place; the material is then bent on line 28, and at the same time lines 44 and 48 are creased so that the pleats formed by panels 42 and 46, respectively, will fold and lie across panels 26 and 30, and overlie each other at panel 30. This brings tab 8 into coincidence with tab 10, and the margin 62 portions of panels 42 and 46 into registry with the margin for panel 30. The pleats formed by panels 42 and 46 begin at the lower rear corners of the box and extend across the back panel 26 and lid 30 to reinforce the same.

Front panel 16 is then folded up on line 16, corner panels 34 and 38 being pleated inwardly by creasing lines 36 and 40, respectively. As these pleats begin at the lower front corners of the box, front panel 16 is reinforced. The box is thus in the form illustrated in Figure 3. Bottom panel 12 is fully exposed from above, and a wide opening exists from the front between the inward edges of upstanding margins 62. This clear access into the box facilitates the ease of packing the same.

Closing of the box is illustrated in Figure 4. Panels 50 and 56 are pleated inwardly and the lid 30 closed down. The entire peripheral margin, in overlapping layers, now extends perpendicular to, and projecting outwardly of, front panel 16. Each outside face of the box is a clean unbroken surface as all folds are hidden from view. Rigidity is obtained by beginning all pleats at the corners of the box, particularly the lower corners, and is also provided by the overlapping pleats on lid panel 30. Furthermore, the sheet of material is uncut and unbroken, and except for the closing margin, there is no opening in the material pervious to the passage of moisture. A further characteristic of the box is that the folds or pleats lie against the front, back, and top panels only, the end and bottom panels being of but one thickness of material.

To seal the box, the superimposed margins which in whole comprise margin 62, are bent downwardly on the fold line 64. An exaggerated view of this appears in Figure 6, it being noted that the usual foil or paper thickness of the material of blank 2 does not produce such a gross thickening of the joint as would necessitate an enlargement of panel 30 and its adjacent margin as might seem required. It is apparent, however, that the margin 62 can be increased in width if needed by using a blank material of, say, cardboard thickness, in order to bring the edges of the overlapped margins into alignment. Tabs 6, 8 and 10, in overlapping order, are then secured to the face of panel 16 to complete the sealing of the box.

When blank 2 is of very thin material, it is apparent that a reinforcing frame can be inserted in the box. For handling and shipping the box an exterior wrapper or container as illustrated in Figures 7 and 8 is employed. This consists simply of a blank 70 having panels separated by fold lines to correspond to the sides of the box, and a sealing flap 72. If the material of box blank 2 is transparent, a window 74 may be formed in blank 70 at a point where it will cover only a part of the box free from superimposed folds of material, so the contents of the box will be visible through the window.

When the box is closed and sealed, the tabs 6, 8 and 10 are adhesively united to each other and to the face of panel 16. Overlapping portions of margin 62 are thus held tightly against each other. To open, the tabs are seized and torn off, the margin portions thus becoming free and separating to permit the ready lifting of lid 30. To facilitate the tearing off of tabs 6, 8, and 10, the material of blank 10 preferably is cut so that the direction of the fibers, or the grain of the material parallels fold lines 14 and 28.

Having now described the means by which the objects of the invention are obtained, I claim:

A folded box comprising a single sheet of material having integral bottom, front, back, and end panels, a top panel joined to the back panel and being equal in size to the bottom panel, rectangular pleat forming panels extending from said end panels, first corner panels joining said end and pleat forming panels to said back and top panels, second corner panels joining said front and end panels, a marginal edge portion extending from and about the entire periphery of said sheet of material and being coextensive with the front, corner, pleat forming, and top panels; said material being folded on lines defining said panels, on diverging diagonal lines transversing the first corner panels, on diagonal lines extending at right angles to the respective first mentioned diagonal lines traversing said pleat forming panels, and on diagonal lines parallel to the diagonal lines of the pleat forming panels traversing said second corner panels; whereby the first corner panels overlap the back panel and top panel and the pleat forming panel underlaps the top panel, and with all of said marginal edge portion lapped upon itself and in coinciding relation with the marginal edge portion of the top panel and coextensive therewith, said lapped marginal edge portion projecting outwardly beyond the upper edge of said front panel.

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