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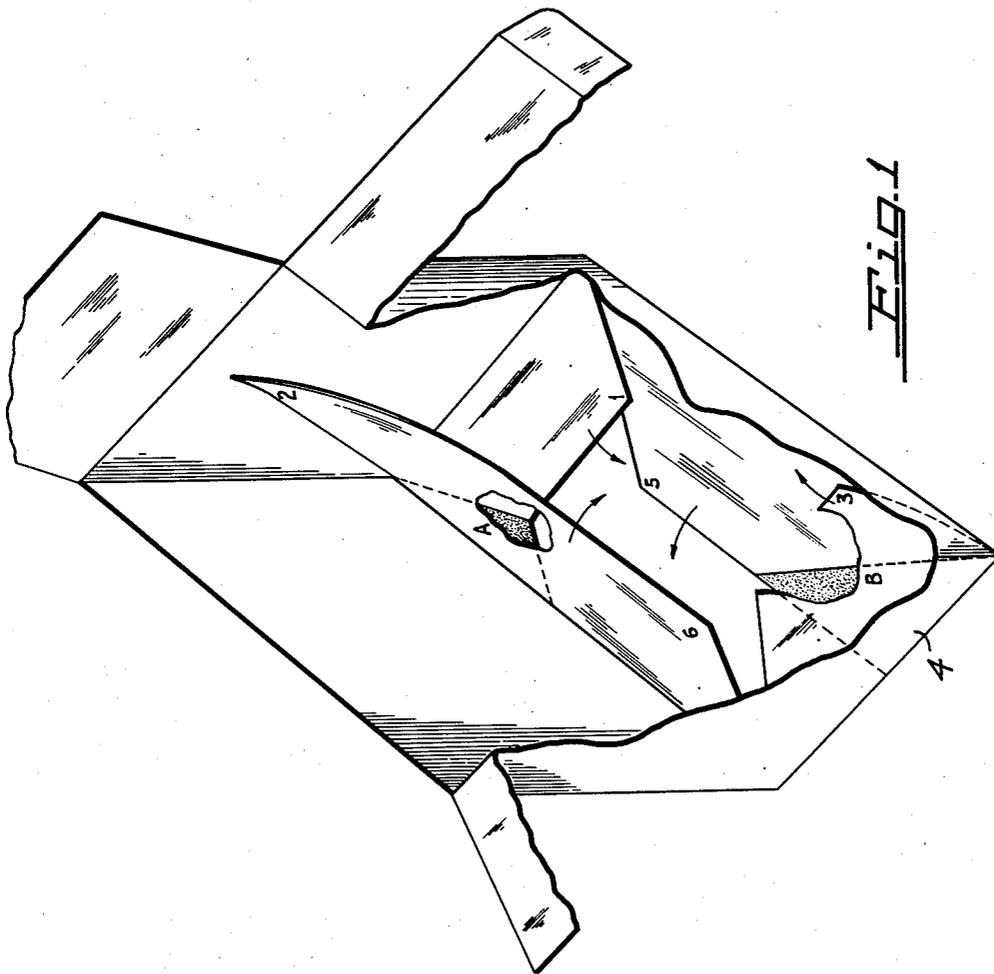
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2,348,378

CARTON

Filed April 30, 1942

2 Sheets-Sheet 1



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Fig. 2

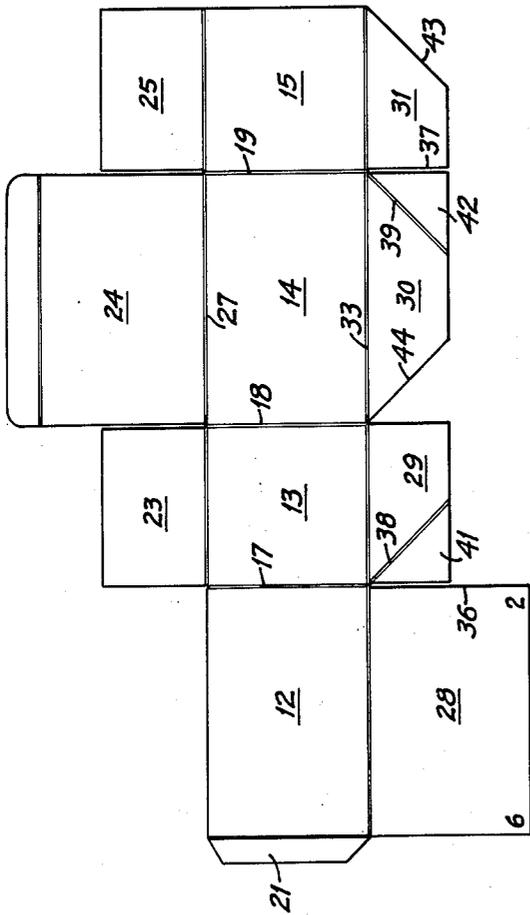
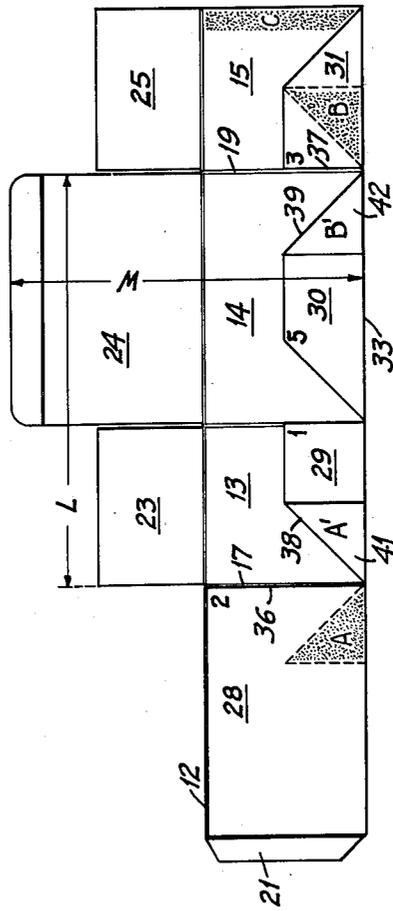


Fig. 3



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UNITED STATES PATENT OFFICE

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CARTON

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Application April 30, 1942, Serial No. 441,242

1 Claim. (Cl. 229—41)

My invention relates to folding cartons, and the broad object of my invention is the provision of a carton which unfolds from a flat pack into a secure and stable carton in response to the single movement of separating the side walls of the carton.

Another object is the provision of a folded carton in which the bottom comprises parts which automatically move into place from a flat pack when the carton is opened for use by pulling opposite sides apart.

Still another object is the provision of a carton blank which is readily handled through folding and gluing machines now in use to emerge therefrom in a flat bundle or pack having the characteristics described.

My invention possesses other objects and valuable features, some of which, with the foregoing, will be set forth in the following description of my invention. It is to be understood that I do not limit myself to the showing made by the said description, and the drawings, as I may adopt variant forms of my invention within the scope of the appended claim.

In the drawings

Figure 1 is a perspective view of my carton, portions thereof being broken away to show the structure.

Figure 2 is a plan view of the blank out of which my carton is made; and

Figure 3 is a plan view of the blank after the folding operations have been begun.

In terms of broad inclusion my carton comprises a single piece of fibreboard creased and cut for folding and gluing into a flat pack, which by the simple movement of pulling two opposite sides of the pack apart, opens the pack into a rectangular carton, having four side walls, with bottom forming flaps falling automatically into place, and cover flaps ready for closing. The automatic positioning of the bottom forming flaps is achieved by connecting them, preferably in two pairs, with a hinge joint between the flaps of each pair extending angularly across both from the corner between them. Thus, from the flat pack folded position in which the carton leaves the machine in which it is made, the separation of the side walls to open the carton pulls or unfolds the connected flaps into the bottom plane. At least one flap of the four is shaped to seat in the fold line between a side wall and its connected flap, so as to hold the carton securely in open position. Preferably also one of the flaps as the inside shape and dimensions of the carton

bottom, and is so arranged that it is the innermost of the flaps and the last to unfold into place, so that when the carton is open and the bottom flaps are in position, the inside bottom presents a smooth even surface from wall to wall.

In greater detail, the carton of my invention is made from a one-piece blank of fibreboard, or other suitable material, shown in extended flat position in Figure 2. This blank has already passed through the forming and creasing mechanisms which left it divided into aligned panels 12, 13, 14 and 15, constituting the side walls of the carton. These will later be connected into a rectangular ring by folding on the creases 17, 18 and 19 and gluing the tab 21 to the marginal edge of panel 15. The blank also includes cover forming flaps 23, 24 and 25 joined to one edge of the aligned walls by the crease 27; and bottom forming flaps 28, 29, 30 and 31 joined to the aligned walls on the opposite edge by the crease 33.

The cover flaps may be of any suitable type, the ordinary tuck-in form shown being satisfactory for most uses. The bottom forming flaps, each of which is hinged to a side by the crease 33, are creased and shaped to particularly fit them for the part they have to play in the complete structure. The near edges 36 and 37 of the two outer flaps 28 and 31 respectively are perpendicular to the crease 33 to facilitate folding and gluing; and the remote ends of the two inner flaps 29 and 30 are given creases 38 and 39 respectively extending angularly from the inner remote corners so that the triangular tabs 41 and 42 respectively, so formed, may be folded back. The outer corner of the flap 31 is preferably removed to the line 43; and the outer corner of flap 30, next to flap 29, is also removed to the line 44. When the carton is set up for use, these flaps are exposed on the bottom; and the angled or beveled ends improve the appearance and also avoid loose corners.

The folding of the bottom flaps leaves the blank as shown in Figure 3, with each flap overlying the wall to which it is hinged along the fold line or crease 33; and with the triangular tabs 41 and 42 folded back upon their respective flaps 29 and 30. Areas A and B on surfaces of flaps adjacent these tabs, and on area C on the marginal edge of wall 15 then receive a coating of adhesive; and flap 28 and underlying wall 12 are folded over along the crease 17 upon wall 13 and flap 29, the area A on flap 28 being pressed upon the area A' of the tab 41, and uniting the flaps 28 and 29 along the hinge or fold line 33. The

flap 31 together with the underlying wall 15 to which it is hinged is next folded over along the crease 19, the adhesive coated area B on the flap being pressed upon the area B' on the tab 42, uniting these surfaces to hinge flap 30 to flap 31 along the hinge or fold line 39. The tab 21 now underlies the adhesive coated area C and unites with the marginal edge of wall 15 to connect the four side walls.

In these folding operations, the extension of the flap edge 37 in parallelism with the crease 19, and the full width of the inner end of the flap 31, materially aids in controlling the flap 31 in the folding mechanism and insuring the precision of the folding. Furthermore the square inner end of the flap seats in the crease between the wall 14 and the flap 30, as best seen in Figure 1; and thus aids in holding rigid the open box. In the several views, corners are identified by numerals 1, 2, 3, 4, 5 and 6, so that the folding operations may be more easily followed. It is to be noted that the edge 36 of flap 28 is perpendicular to the hinge line, and that the flap on this edge is preferably the same width as the adjacent wall 13 is long. This is because in the setting up or unfolding of the carton, the edge 36 seats in the fold between the wall 13 and its connected flap 29, and the square end of this flap 28 controls more than any other factor the squareness and rigidity of the carton. These values are both enhanced if the flap 28 is rectangular and the same length as the walls 12 and 14, so that it supports and braces all around the periphery of the bottom structure.

The flat pack comprising the carton now emerges from the machine to be packed for shipment to the user. At its thickest through the glued areas A and B, the pack is the thickness of five pieces of the material. Its length and width are substantially as indicated by the dimension lines L and W of Figure 3, thus forming an extremely compact pack even for a large carton.

This is of course a matter of extreme importance in shipment and storage of such an article.

If the preceding explanation has been understood it will be seen that the carton as it comes from the machine, includes the four side walls in a continuous band, each wall having a flap hingedly connected along its lower edge by a fold or crease line; that the flaps are folded inwardly against their respective walls, and connected in pairs by a hinge joint between the flaps of each pair, the hinge joints extending from diagonally opposite bottom corners across at least one of the flaps of each pair. It will also be clear that if the opened carton is to have square corners, the end of at least one flap of at least one pair of hinged flaps must be square, and that such a result is furthered and the carton strengthened if all the ends of flaps which seat in the fold line between walls and flaps, are made square, and one flap dimensioned to fill the bottom from wall to wall.

When it is desired to open the carton for use, opposite long sides are grasped and pulled apart. This spreading movement of the side walls automatically pulls the flaps out into place to form a bottom because of their hinged connections, the large flap 28 closing down last to form a smooth tight bottom.

In Figure 1, a nearly open carton is shown so that the interrelation of the parts may be seen. Arrows indicate the directions of movements.

I claim:

A carton comprising side and end walls, and a bottom including a flap hinged on each wall, each side flap being hinged to a different end flap on lines intersecting diagonally opposite corners, one of the side flaps having three free edges seating in the hinge folds between the other three flaps and their respective connected walls, and at least one of said end flaps having a free square end seating in the hinge fold between a side flap and its connected wall.

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