

UNITED STATES PATENT OFFICE

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ART OF MAKING RECEPTACLES

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7 Claims. (Cl. 93—49)

This application is in part a continuation of my copending application Serial No. 433,010, filed March 4, 1930, and relates to an art or method of making receptacles such as boxes, trays, covers, caps or cartons of any foldable material, for example cardboard.

A principal object of the invention is to provide a method of receptacle manufacture adapted for economy of material and simplicity of operation, capable of being carried on at high speed by simple machinery. In a preferred instance of my art or method, the object of providing for trimming and reinforcing the edges of receptacles is attained in an improved way. Other objects of invention and features of advantage and utility will be apparent from this specification and its drawing wherein one instance of my invention is explained by way of example.

In the drawing:

Fig. 1 is a perspective view of one receptacle capable of being made by my improved method;

Fig. 2 illustrates a blank adapted to be formed into the receptacle shown in Fig. 1 and also illustrates diagrammatically a preferred manner of cutting the blanks from a continuous strip of material;

Fig. 3 shows the blank of Fig. 2 at an intermediate stage of its conversion into the receptacle of Fig. 1, having had portions turned over, and preferably fastened, to provide turned and reinforced free edges;

Fig. 4 is a section on the line 4—4 of Fig. 1, showing how the end closure elements can interfit; and

Fig. 5 is a section on the line 5—5 of Fig. 4.

Referring to Fig. 2, a blank of suitable foldable material such as paper or cardboard is marked by scores or folding creases 11, 12, 13 and 14 and transverse scores or folding creases 15^a, 15^b, 15^c and 16^a, 16^b, 16^c, into three wall sections, an intermediate or bottom section A, and outer side sections B and C, flexibly conjoined along their side edges, preferably extending in parallel directions, and adapted to be folded into the angularly related positions of Fig. 1.

Each of the other two sides of the five-sided receptacle of Fig. 1 includes a full-size section, D and D^a respectively, integral with the blank. In the blank, these two full-size wall-forming sections comprise extensions of two different ones of the three first described wall-forming sections which are disposed side by side. Preferably as illustrated, full size wall-forming section D is an integral extension of side wall-forming section C, demarked therefrom by fold line 16^d, and full

size wall-forming section D^a is an integral extension of side wall-forming section B, demarked therefrom by fold line 15^d.

Suitable connecting sections in the form of blue laps are provided to hold the five full sized wall-forming sections in the complete receptacle. As illustrated, relatively short lap sections F and F^a are provided at opposite ends of side wall-forming sections B and C respectively. The central or bottom wall-forming section A preferably has extending therefrom at opposite ends, glue laps E and E^a, which may desirably be of somewhat greater length than laps F and F^a, and intermediate in length between the laps F, F^a and the full size wall-forming sections D, D^a.

When it is desired to provide the receptacle with trimmed and reinforced edges the blank preferably includes flaps G, L, G^a and K constituting lateral extensions of the respective vertical wall-forming sections D, C, D^a and B. Fold lines 20, 11, 20^a and 14 which demark these flaps are preferably double crease lines, especially adapting these flaps to be folded flat upon their respective full size wall-forming sections without cracking or injuring the material along these fold lines which define the free edges of the completed receptacle. Obviously certain of the trimming and reinforcing flaps G, L, G^a or K may be omitted without detriment if the corresponding side of the receptacle is not thus to be trimmed and reinforced. For example, only three of the flaps G, L, G^a and K may be provided, or in some cases merely the flaps G and L, adapted to trim and reinforce two adjacent angularly disposed walls of the complete receptacle. As particularly pointed out in my above copending application, the flap G, the lap E and the lap F are preferably proportioned with respect to each other to lie in the complete receptacle in the same plane without overlapping, preferably forming a substantially complete inner wall as shown in Figs. 4 and 5, fastened to the outer full size section D. The sections G^a, D^a, E^a and F^a, preferably are identical in shape with the corresponding sections at the other end of the blank, and are adapted to interfit in the same manner.

In the manufacture of the receptacle, the blanks are cut, as indicated in Fig. 2, from a continuous web of material, the stepped configuration of the end comprised of the full size section D and the laps E and F interfitting or interlocking with the oppositely stepped end of the next succeeding blank (indicated in dotted lines in

Fig. 2). In this way there is the minimum of waste of material.

By disposing the end closure elements of the blank in reversed symmetry, as in Fig. 2, successive blanks, when cut, lie in the same position, not reversed. This constitutes a distinct advantage, since the blanks are in position to be presented successively to folding instrumentalities without reversal of alternate blanks or change in alternate operations of the folding machine. This feature is especially advantageous in making boxes from stock having coating, covering or printing intended in each box to appear invariably on the inner or the outer side, with the attendant impossibility of folding up alternate boxes toward opposite sides of the stock.

A preferable way of forming the box of Fig. 1 is to move the blanks of Fig. 2 continuously in the direction of the arrow x (which also indicates the preferable direction of the grain of the stock), apply glue to successive edge members G, L, K and G^a, and then fold over these edge members of the material upon the adjacent outer wall sections with the glue between the surfaces thus overlaid, in the manner shown in Fig. 3. Since side and end reinforcing or trimming flaps (for instance parts G and L) are located in substantial prolongation, they may be folded simultaneously and/or by the same instrumentality. Since in these blanks these flaps are folded in a direction perpendicular to the direction of travel of the blank, they may be turned over by a simple plow or folding device without substantial stopping of the forward motion of the blank. I consider it advantageous to be able to form the end reinforcing or trimming before or independently of the setting up of the walls of the box, since the material may be much more readily folded (especially by machinery) when in a flat blank than after it has been set up into a box.

The blank may now be erected into a box and the ends of the box closed and affixed, preferably by means of a simple box-making machine of the usual plunger type, adapted to apply adhesive to appropriate places on the blank, to fold the walls and glue laps of a blank into their intended positions in the receptacle and to apply a compressive force to fasten the lap sections. The entire stream of cut and creased blanks, or a stack formed therefrom, is adapted to serve as a supply for such machine, the blanks cut successively from the strip of material being identically positioned, and the machine operating identically on each successive blank. My improved process avoids any reversing of alternate blanks, or any necessity for separating the stream of cut and creased blanks into groups of oppositely disposed blanks, or any necessity of operating differently upon alternate blanks as by folding toward opposite surfaces of the material. After positioning the end-closure elements D, E, and F, as shown in Figs. 4 and 5 with glue therebetween, the usual heavy compression afforded by the machine may be applied firmly to glue these elements together. Since the reinforcing or trimming flap G has previously been folded over upon end wall section D, as explained above, this flap G also receives the compressive force applied to the other end-closure elements, and a substantially continuous double-thickness end closure is strengthened by gluing under pressure in one operation, and in the usual type of plunger machine. No hand or machine work subsequent

to this assembling operation is required to provide the turned and reinforced edges.

I claim:

1. Method of forming receptacles from foldable material comprising cutting from a strip of material a series of blanks each consisting of at least three flexibly conjoined full size wall-forming sections disposed side by side transversely of the strip and two full size wall-forming sections comprising integral extensions of different ones of said three first-named sections and extending longitudinally of the strip in opposite directions, the cutting of the blanks being characterized by interlocking of the longitudinal extensions of the successive blanks and by the cutting of the blanks in longitudinal prolongation without reversal of alternate blanks, and assembling successively cut blanks into receptacles by like operations characterized by folding successive blanks toward the same surface of the material.

2. Method of making a receptacle of foldable material in such a way as to provide reinforced edges on each of two angularly related walls of the finished receptacle, comprising forming a blank demarked into wall-forming sections of which both sections to be reinforced, and angularly disposed in the finished receptacle are of full size equal to respective faces of the receptacle to be constructed, have their edges to be reinforced lying parallel in the flat blank and have extending from said edges integral reinforcement portions flexibly conjoined thereto, folding said reinforcement portions in the same direction upon their conjoined wall-forming sections while the blank is in a flat state, and erecting the thus prepared sections of the blank into a receptacle, about an integral bottom which connects opposite wall-forming sections of the blank.

3. Method of making a receptacle of foldable material in such a way as to provide reinforced edges on each of at least three side walls of the finished receptacle comprising forming a blank demarked into sections each of which is of full size equal to a respective face of the receptacle to be constructed, with portions adapted to serve as folded-over edge reinforcements extending from parallel edge boundaries of at least three of the sections of the flat blank, folding said reinforcement portions inwardly from two opposite sides of the blank upon their conjoined full size wall-forming sections along the parallel edge boundaries of said three sections while the blank is in a flat state, and folding and fastening the blank in the form of a receptacle having the previously folded reinforcement portions running substantially around at least three full sides of the receptacle.

4. Method of making a receptacle of foldable material in such a way as to provide reinforced edges on each of two pairs of angularly related walls of the finished receptacle comprising forming a blank demarked into wall-forming sections of which both sections corresponding to said two walls of each pair to be reinforced are of full size equal to respective faces of the receptacle to be constructed, are in prolongation one with the other and have integral reinforcement sections conjoined thereto along the edges to be reinforced, folding said reinforcement portions inwardly from two opposite sides of the blank upon their conjoined wall-forming sections while the blank is in a flat state, and erecting the thus prepared blank into a receptacle.

5. Method of making a receptacle comprising

forming a blank including opposite side wall sections connected by an integral bottom section, and at least one end wall section of full size and extending in prolongation of one of said side wall sections, said end section and its adjacent side wall section each having integral reinforcement sections conjoined thereto along the edges to be reinforced, folding over and fastening both said reinforcement sections upon their conjoined wall-forming sections, and thereafter erecting the thus prepared blank into a receptacle, including turning up said side walls about said bottom, and fastening the reinforced end section in place to close the end of the receptacle.

6. Method of forming receptacle blanks from foldable material comprising cutting from a strip of material a series of blanks each consisting of at least three flexibly conjoined full size wall-forming sections disposed side by side transversely of the strip and two full size wall-forming sections comprising integral extensions of different ones of said three first-named sections and extending longitudinally of the strip in opposite

directions, the cutting of the blanks being characterized by interlocking of the longitudinal extensions of the successive blanks and by the cutting of the blanks in longitudinal prolongation without reversal of alternate blanks.

7. Method of making a receptacle comprising forming a blank including a pair of full size wall sections adapted to lie opposite to each other in the finished receptacle and connected by an integral bottom section, and another pair of full size wall sections integral with the blank, the said four full-sized sections each having an integral reinforcement section conjoined thereto along the edge to be reinforced, folding over and fastening said reinforcement sections upon their conjoined wall sections, and thereafter erecting the thus prepared blank into a receptacle, including turning up said reinforced side wall sections about said bottom section and fastening said reinforced wall sections in place to close respective faces of the receptacle.

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