Aug. 15, 1933. A. KLEIN 1,922,854

CARDBOARD BOX

Filed April 15, 1932

Fig. 1

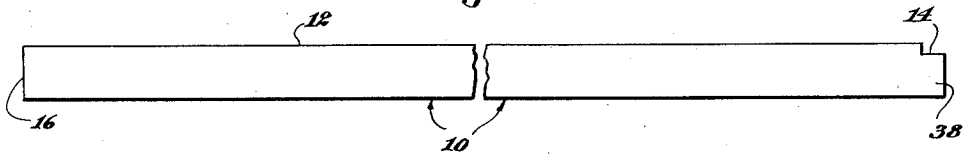


Fig. 2

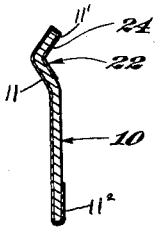


Fig. 3

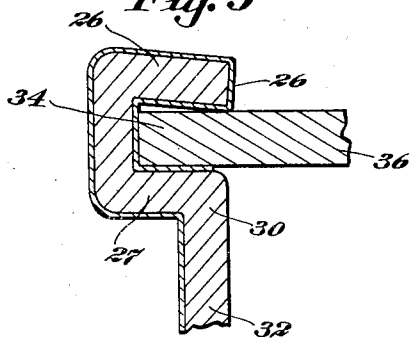
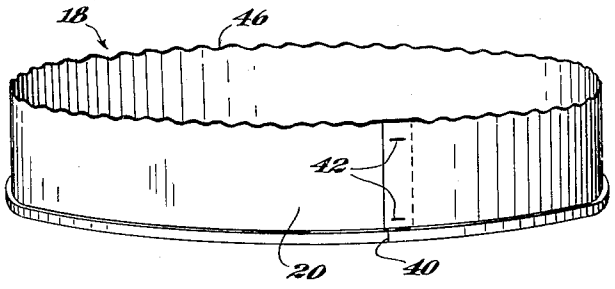


Fig. 4



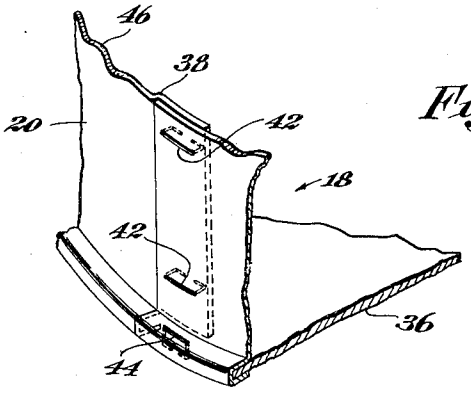


Fig. 5

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Patented Aug. 15, 1933 1,922,854

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1,922,854

CARDBOARD BOX

Adolph Klein, New York, N. Y.

Application April 15, 1932. Serial No. 605,402

6 Claims. (Cl. 229—5.5)

This invention relates to paper box construction, and is directed more particularly to an improvement upon the invention disclosed in my Patent No. 1,568,608, granted January 5, 1926.

Customarily, for the manufacture of paper boxes as in my patented structure, the several elements defining the walls of the box structure not only are cut and shaped at the factory, but they are finally pasted up into the form in which they are to be used, and in that assembled form, they are shipped from the factory to the point at which they are placed in use. Such procedure, of course, results in great loss in efficiency and increased cost of transportation as such a finished structure requires for storage many more times the space necessary for storing the separate elements of such boxes.

It is an object of the invention to provide a box structure, the construction of which is effected in such manner that the several elements, themselves simply manufactured, may be storaged and shipped in compact form, the box structures lending themselves to handling in this knock-down condition and to assembly at the point of use by persons having no special skill. The principles involved in the manufacture of this box structure eliminate the necessity of pasted strips, either for holding sections together or to cover up unsightly joints formed in bonding together portions of the structure.

For the purpose of this invention, paper board strips, cut to a predetermined length, have at least one longitudinal straight edge. Such strips are subjected to a forming operation in which, either as simultaneous performances, or as successive steps, they are shaped to the form of the container for which they are finally intended, and there is formed, at the straight line edge, a deformation including a cup-shaped depression facing inwardly. Either continuously in the same operation, or by a step subsequent to the first deforming operations, the depression is worked so that it now disposes a flange extending outwardly from the strip. This flange, by the operation, on its inner side discloses a groove, opening inwardly, and the effective width of which is equal to the thickness of an end wall member to be inserted therein. The groove is formed by a plurality of walls, a pair of which normally extend away from the opening in diverging relation. One of the walls of the groove is formed by the free straight edge and is set in such position that normally it tends resiliently to close the open end of the groove.

The invention herein disclosed contemplates that a free edge of the strip be bent at an angle that is of the character shown in the drawing. In view of the fact that the material with which this invention deals is of a laminated construction, the sharp bends called for by the invention adjacent the free edge of such material will, unless special provision is made, cause the laminations at the free edge to separate and spread, and to overcome this, my invention further contemplates a provision by which a strip of material such as of a paper or textile character, shall first be placed about the said free edge so as to serve as a binder about the free edge and prevent the aforementioned spreading or separation of the laminations.

It is a further feature of my invention in connection with the assembly of the aforementioned binding strip about the free edge, that the binding strip may be of a character that is inherently ornamental, or may have ornamental characteristics applied thereto before the association thereof with the paper-board strip, of which the end wall of the box is made, because I have found that the ornamentation will not be effected by the steps to which the paper-board strips are subjected as herein set forth.

As a result of this arrangement, the incorporation of the ornamental features are simplified, particularly as the ornamental characteristics are not adversely effected during the processing of the strip.

The end wall, a flat board section cut to the contouring of the container, may then be assembled, as a bottom or a top, with the deformed strip. The board section, at its edges, is inserted between the walls of the grooves, separated slightly for that purpose. Then merely by the resiliency of the free wall, the wall will be clasped and retained firmly in relation to the side wall forming strip. The strip may then be secured at its ends in any desirable manner, and also to the section for assuring the parts against separation thereafter under any exceptional strain.

The invention is not intended to be restricted to any particular construction or arrangement of parts, or to any particular application of such construction, or to any specific manner of use, or to any of various details herein shown and described, as the same may be modified in various particulars or be applied in many varied relations without departing from the spirit and scope of the claimed invention, the practical embodiment herein illustrated and described merely showing one of the various forms and modifications in which the invention might be embodied.

For the attainment of these objects and of such other objects as may hereinafter appear or be pointed out, I have illustrated an embodiment of my invention in the drawing wherein the same reference characters refer to the same parts throughout and wherein:

Fig. 1 is a plan view of a paper board strip before it has been formed to embody features of the invention;

Fig. 2 is a cross-sectional view of the strip, illustrating its appearance in an intermediate stage of the forming process;

Fig. 3 is a view, similar to Fig. 2, of the strip in the final stage of the forming process and showing an assembled end wall;

Fig. 4 is a view in perspective of a container section, constructed to embody the invention; and

Fig. 5 is a detail perspective view, illustrating the manner in which the end wall and side wall of a container section are interfitted and retained.

In the manufacture of paper boxes of this character, paper boards of considerable thickness, but having elasticity of a high order, are cut into blanks 10, such as shown in Fig. 1. Each of such blanks has at least one longitudinal edge 12 formed as a straight line. The strip 10 has applied to one face thereof, a strip 11 of a material such as paper, textile or the like, and which may be inherently ornamental, or which may have ornamentation applied thereto by a pressing, stamping, or printing operation, and will serve to give to the outer face of the complete structure a desired finished ornamental appearance. This strip 11 has its upper free edges bent about the upper and lower ends of the blank 10 as shown in Figure 2 of the drawing to provide the overlapping portions 11' and 11^2 for purposes that will more fully appear hereinafter. Immediately at one of the corners of the blank formed by edge 12, there is a cut-out 14, the dimensions of which will be referred to hereinafter. The blank is of a length such that the portion from end 16 up to and excluding that portion defined by the bounds of cut-out 14 is substantially equal to that of the perimeter of a container section 18 to be formed therefrom, that is, its extent is substantially equal to the developed length of the side wall 20 of such container. This side wall, in the final structure, may be cylindrical in its effective contour, or heart-shaped, or have any other desired shaping of this character.

In order to produce a container of any such desired shaping, blank 10 is subjected to processing by which it will be bent and given a set, from which there will result a normal tendency to assume a definite container wall shaping. Such processing may be carried out with the blank in a wet state and subjected to considerable pressure, the blank being rolled or otherwise worked into the necessary shaping. Either simultaneously with this shaping operation or as a separate step, the material at edge 12 and to a depth equal to that of cut-out 14, is cupped as shown at 22 in Fig. 2, the cup being slight and facing inwardly of the contouring of the blank.

The blank may move continuously from stage to stage of the forming operation, or the stages may not be so related. In any case, in the next stage of the process, the cup portion 24 is subjected to processing by which the walls of the cup are more sharply indented and, in fact, produce a grooved edge for the blank, practically U-shaped in cross-section, and the arms of the U being substantially flat or rectilinear in effect. The walls of the cup are, therefore, formed substantially by flat surfaces, the depression of the cup or groove facing inwardly. The free wall 26, by the processing, instead of being exactly parallel to the other related wall 27 of the groove, is set in a diverging relation, inwardly of the groove so that its normal tendency will be to close the open end of the groove. Because of the natural resilience of the material, a spring member thus is formed and may be made operative to clamp a member inserted into the groove as the free edge 28 resiliently tends to move toward end 30 of the flat body 32 of the blank. By the processing, the groove 34, thus formed, when its walls are parallelly arranged, is made of sufficient width to receive snugly therewithin the end wall 36 of a container. The resilient bias of end 30 provides, in addition, a spring clasp for retaining that wall in the groove when the two are associated.

Upon referring to Figure 3 of the drawing, it will be observed that the top wall 26 is bent at an extremely sharp angle to the side wall and I have found that in subjecting paper-board to such operation that the board, due to its fibrous and laminated character, will tend to spread at the free end of the top wall 26 due to the separation of the laminations of which the board has been built up and that it is a further important feature of my invention that in connection with the formation of the groove of the character herein set forth and the provision of the opposed walls 26 and 27 and the connecting end webbing, that there be associated with the free end of the end wall, the strip 11, and its overlapping portion 11', because this overlapping portion 11' will serve to prevent this undesired spreading of the free end of the end wall 26 and will maintain this end wall in its desired compacted relation.

By the original forming operation, or if desired, by some intermediate step, the excess board at end 38 will have been inset, as shown in Fig. 5, a depth substantially equal to the thickness of blank 10 and also a distance equal substantially to the length of the cut-out 14. As shown in this figure, the two ends of the strips of the blank may now be brought to lapped relationship, in which case the ends of flange 40 will be brought into abutting relation and thus form a continuous, ornamental flange for the container section.

Before this is effected, however, end wall 36 will have been positioned within the groove merely by moving edge 28 slightly to open the groove, and then by releasing it to clamp the wall in position. After the two ends of the blank are closed in lapped relationship, securing means such as staples 42 may be used to retain the ends locked against separation. An additional staple 44 may be driven through the flange and its associated end wall at any position to retain the members fixedly associated against possible separation. Two sections, thus formed, appropriately designed, may be interfitted to form a container.

The deformed blanks and flat end wall, in their non-assembled condition, may be shipped or stored as desired, the volume they would assume in such case being many times less than that necessary for the transportation or storage of the assembled containers. The assembly of the end wall with the groove may be accomplished, just before use, and in quantities as such containers are required, by anyone with little or no skill. Tacking the members together by means of suitable apparatus of well-known effect

is accomplished simply and without pasting or similar troublesome operations. Ornamentation, applied to the blank before it was formed into its final condition, or at any stage of the forming process, will not, in any way, be marred by the operations of assembly. Edge 46 of the blank may be given any desired ornamental contouring in order to add to the striking appearance of the container.

Many other changes could be effected in the particular apparatus designed, and in the methods of operation set forth, and in the specific details thereof, without substantially departing from the invention intended to be defined in the claims, the specific description herein being merely to illustrate an operative embodiment carrying out the spirit of the invention.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is—

1. A knock-down box structure including a side wall-forming element consisting of a paper board strip having a corner thereof cut out, the longitudinal edge of the strip forming the corner being deformed to provide a groove, the walls of the groove consisting of portions biased toward each other to provide a resiliently engaging member, the end edges of the strip being engageable without hindrance from the grooved edge formation.

2. An element for a knock-down box structure comprising a paper board strip, substantially rectangular in shape, the strip being worked into the form of a continuous wall for a box, one longitudinal edge of the strip being formed to provide a groove having a resilient edge tending to move inwardly to close the groove.

3. The process of forming a paper box construction having a side wall, which comprises the step or steps of first forcing the material of a paper board strip out of the plane thereof to form in the strip a flange projecting from its outer face and a groove on its inner face, said groove being defined by two walls which diverge in the direction of the open end of the groove, and then forcing said walls toward each other so as to give them a permanent bias of a character which will cause the walls to grip between them a closure member forced therebetween.

4. The process of manufacturing paper box constructions in which a section of the construction has a continuous side wall associated with an end wall for the construction, which includes: forming a flexible paper board strip having a straight line edge to the shaping of the side wall of the box construction and deforming the straight line edge of the formed strip to form an indentation opening therefrom toward the interior of the construction, simultaneously bringing the edges of the indentation toward each other to dispose them in converging relationship inwardly of the box construction and pressing them to fix them resiliently in that relationship, and positioning an end wall member between the converging edges of the side wall of the box construction.

5. A paper board blank for paper box construction having a straight line edge consisting of a paper board strip longer than the perimeter of the side wall of the box construction, one corner of the edge being cut off, and an inwardly opening cupped flange formed along the edge, the walls of the flange being biased and converging toward each other, inwardly to such an extent that an end wall for the box construction may be clampingly engaged by both the walls, the extent of the strip cut off at the corner being equal in length to the excess length of the strip and in width to the amount of the strip necessary for forming the cupped flange.

6. The process of manufacturing paper box constructions, in which a section of the construction has a continuous side wall associated with an end wall for the construction, which includes: first associating a binder strip about a longitudinal straight edge of a stub of flexible paper board, simultaneously forming the flexible paper board strip to the shaping of the side of the box construction and flanging an edge of the formed strip to form a pocket opening therefrom toward the interior of the construction, and thereafter deforming the flanged edge to dispose of the flange in converging relationship inwardly of the box construction whereby the binder strip will hold the free straight edge against spreading.

ADOLPH KLEIN.