Aug. 18, 1942. W. A. BECKER 2,293,187

COLLAPSIBLE BOX

Filed April 4, 1940 2 Sheets-Sheet 1

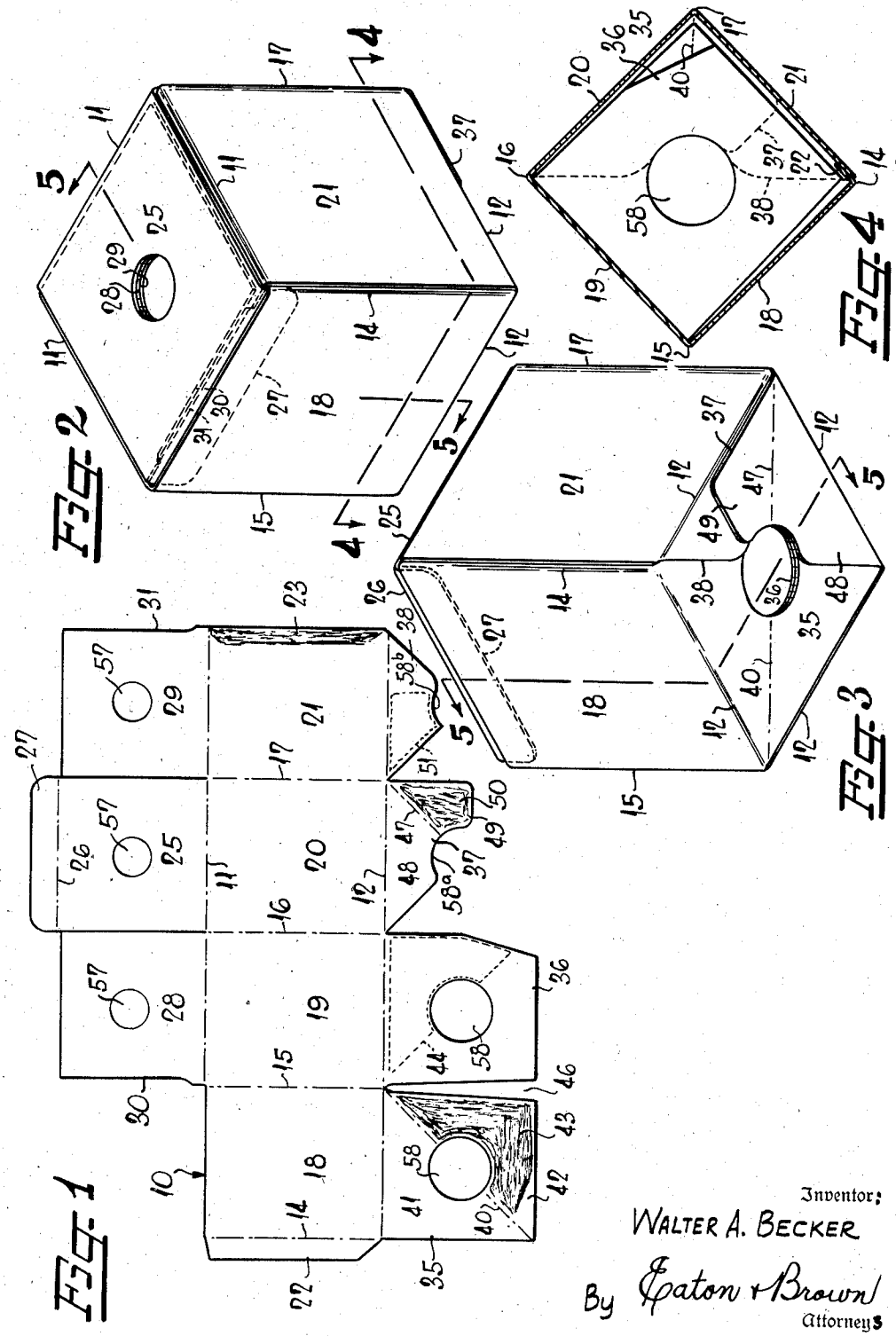


Fig. 1

Fig. 2

Fig. 3

Fig. 4

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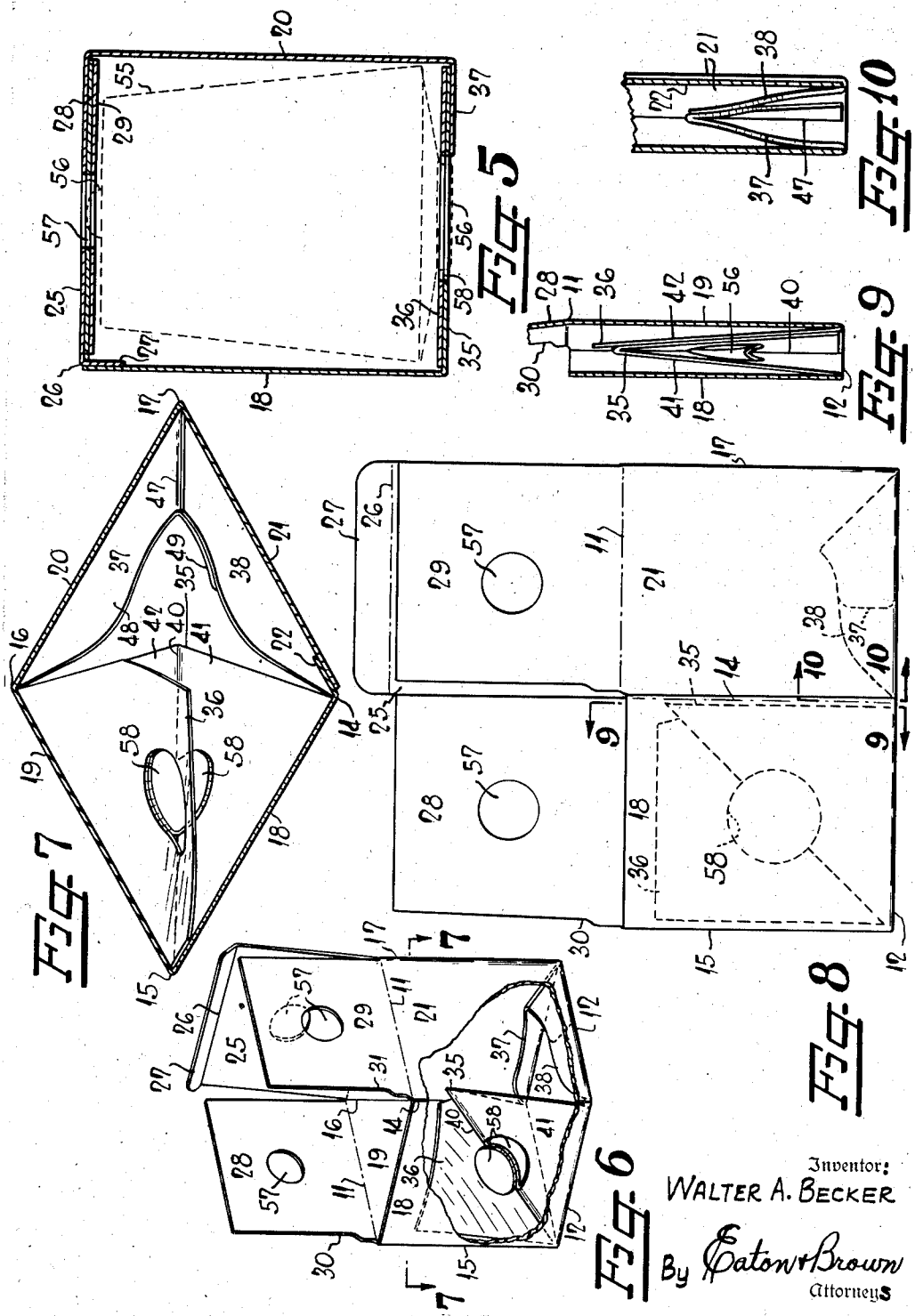


Fig. 5

Fig. 10

Fig. 9

Fig. 7

Fig. 8

Fig. 6

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COLLAPSIBLE BOX

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Application April 4, 1940, Serial No. 327,770

2 Claims. (Cl. 229—41)

This invention relates to a box or carton and more especially to an article of this type constructed from one piece of material, so as to be collapsible. More specifically, the invention relates to a durable collapsible container especially ocnstructed to accommodate packages of yarn wound upon a core or cone. It is well known that the ends of cones upon which yarn is wound often project beyond the wound yarn. These projected portions make it necessary for the carton which houses the same to be unnecessarily large, because rectangular containers are generally used for this purpose, and therefore must be made long enough to encase the cone as well as the yarn.

It is an object of this invention to provide a collapsible rectangular container having alined holes in the top and bottom portions for accommodating the projecting ends of the cones. It is only necessary that the yarn be protected, therefore, the ends of the cone will extend through the holes and be exposed to view. The top and bottom faces of the yarn packages however, will fit closely against the inside top and bottom faces of the container thereby making it possible to use a box of a smaller size with a minimum amount of material therein. By confining the ends of the cone in the top and bottom of the box, chafing of the yarn packages is prevented, especially when the yarn package is of a much smaller diameter than the width of the box.

It is another object of this invention to provide a collapsible container having sidewalls, top and a bottom, said bottom being formed from two layers, one of said layers being creased diagonally and the other layer being uncreased and attached to one of the folds of the first layer. A construction of this type, provides a container which will permit easy folding and opening and also presents a uniform uncreased surface on the interior of the bottom. This uncreased bottom or layer will also add to the rigidity of the box, thereby preventing it from collapsing easily. When opening the box, from a folded position, the creased bottom will cause the uncreased bottom to return to the normal position within the box, and likewise when collapsing the box, the creased bottom will rotate the uncreased bottom to a position parallel with the sidewalls.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is a developed view of a sheet of cardboard or other suitable material from which the improved collapsible box is formed;

Figure 2 is an isometric view of the completed box as it appears when in an erected position, illustrating the top construction;

Figure 3 is an isometric view looking at the erected box shown in Figure 2 from a slightly different angle illustrating the bottom construction;

Figure 4 is a sectional plan view taken along the line 4—4 in Figure 2;

Figure 5 is a vertical sectional view taken along the lines 5—5 in Figures 2 and 3, showing in dotted lines the outline of a package of yarn when placed therein;

Figure 6 is a perspective view, with certain portions thereof broken away, showing the box in a partially collapsed position;

Figure 7 is a sectional plan view taken along the line 7—7 in Figure 6;

Figure 8 is a side view of the box when in a collapsed position;

Figure 9 is a sectional detail view taken along the line 9—9 in Figure 8;

Figure 10 is a sectional detail view taken along the line 10—10 in Figure 8.

Referring more specifically to the drawings, the numeral 10 denotes a blank made of cardboard or other material, which blank is scored longitudinally upon dot-dash lines 11 and 12, and which is scored transversely along dot-dash lines 14, 15, 16 and 17. The areas 18, 19, 20 and 21 are defined by these dot-dash scored lines. Sidewall 18 has integral therewith a tab 22 which tab is adapted to be secured to a glued surface 23 which extend along one edge of the sidewall 21. Of course it is evident that any other suitable securing means such as stapling, riveting or the like may be employed as an equivalent.

The upper edge of the sidewall 20 has a cover flap 25 integral therewith, said flap being creased along a dot-dash line 26 (Figure 1) thereby forming an insertion tab 27. Likewise the sidewalls 19 and 21 have integral therewith tabs 28 and 29 respectively, said tabs being cut away as at 30 and 31, respectively, so as to permit easy insertion of the tongue 27 inside the front sidewall 18 when the box is in erected position and when it is desired to close the same.

The bottom edges of sidewalls 18, 19, 20 and 21 (Figure 1) have integral therewith tabs or extensions 35, 36, 37 and 38 respectively. The tab 35 is diagonally creased along dot-dash line 40, thereby forming two sections or areas, namely, 41 and 42. The section 42 has a suitable adhesive

such as glue or the like 43 applied to one side thereof which adhesive surface is adapted to be attached to the area enclosed by dotted lines 44 on the bottom side of tab 36 (Figure 1) when the box is in an assembled position. The tab 36 is not creased and is adapted to form the top layer of the bottom of the box. Also it is seen that a substantial clearance is provided between the tabs 35 and 36 as at 46 so as to permit easy folding or erecting of the box without crinkling or otherwise creasing the uncreased bottom extension 36. The sidewall 20 has integral with its lower end the tab 37, previously described, which tab is creased along dot-dash line 47 thereby forming two sections or folds 48 and 49. The section 49 has glue 50 applied to the upper surface thereof which glue is adapted to be attached to the lower area defined by the dotted lines 51 on the adjacent tab 38. The tabs 37 and 38 when attached, serve as a stop to prevent the layers 35 and 36 from collapsing outwardly. These tabs also serve as an additional reinforcement for the bottom of the box and are constructed so as to fold inwardly along with the other tabs 35 and 36.

To assemble the box it is necessary to bend the sidewalls along lines 14, 15, 16 and 17 and then secure the tab 22 to the glued surface 23. Then the bottom tabs 35, 36, 37 and 38 are bent inwardly along crease lines 12, after which the glued surface 43 is attached to the area defined by dotted lines 44 on the bottom of tab or extension 36. At the same time, the glued surface 50 is attached to the area defined by the dotted lines 51 on the bottom side of extension 38. This completes the assembly of the bottom. At this time, the extensions 25, 28 and 29 remain in a vertical position. If it is desired to close the box, it is only necessary to bend these last-named extensions inwardly along bend lines 11 and, of course, the tab 27 is then bent inwardly so as to fit on the inner side of the front wall 18 in the manner shown in Figure 2.

It will be noted by observing Figure 4 that the top layer 36 of the bottom is uncreased and covers substantially the entire surface, whereas the creased bottom 35 therebelow has its fold or section 42 attached to the lower side of the uncreased bottom; consequently, when the creased bottom 35 folds upon itself in the manner shown in Figures 6 and 7, the uncreased bottom 36 will be rotated upwardly within the box.

The position occupied by the creased bottom 35 and the uncreased bottom 36 when the box is in completely collapsed position is illustrated in Figures 8 and 9. In other words, when the box is collapsed, the two areas 41 and 42 of the creased bottom 35 are folded upon themselves, and simultaneously therewith the area 41 rotates inwardly and upwardly about its crease line 12. Also simultaneously with this rotation, the attached uncreased bottom 36 rotates inwardly and upwardly about its crease line 12, which crease lines separate the sidewalls from the bottom tabs. When the box is erected to the position shown in Figures 2 and 3 the reverse action will take place, namely, the areas 41 and 42 of the creased bottom 35 will unfold thereby restoring the uncreased bottom 36 to normal position.

The purpose of the tabs 37 and 38 is to form a stop for the bottom tabs 35 and 36 to prevent them from folding outwardly when the box is in an erected position. The tabs 37 and 38 also afford a reinforcement for the bottom and add rigidity thereto. Figures 3 and 4 illustrate the position occupied by the members 37 and 38 and it is here seen that they normally close the clearance which exists between the side walls 20 and 21 and the edges of the layers 35 and 36.

Figure 5 shows a package of yarn 55 in dotted lines, which package is wrapped around a core or cone 56 which is also shown in dotted lines. This core extends a slight distance beyond the package of yarn and the upper end thereof is adapted to penetrate suitable coinciding holes 57 in the top extensions 25, 28 and 29. Likewise the bottom portions of the box have slightly larger coinciding holes 58 therein which are penetrated by the lower projecting end of the cone 56. These holes are cut in the extension tabs 35 and 36. The tabs 37 and 38 are cut away as at 58*a* and 58*b* respectively, so that when the bottom is in an assembled position these cut-away portions will clear the holes 58 in the bottom extensions 35 and 36 thereabove. These holes permit the container to more closely fit the end of the yarns thereby lessening the size of the box and minimizing the amount of material necessary to make the same.

The box can as well be made without the holes in the bottom and top portions, where it is to be used for packaging articles other than cones of yarn.

In the drawings and specification, there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. A collapsible container having four sidewalls and an inwardly foldable bottom, said bottom comprising an uncreased extension hingedly secured to one of the sidewalls and substantially covering the entire bottom surface of the container when in an erected position, a diagonally creased extension disposed below the uncreased extension and being hingedly secured to an adjacent sidewall, said diagonally creased extension also substantially covering the entire bottom surface of the container when in an erected position, the proximate faces of said extensions being secured together along one side of said diagonal crease, whereby the creased extension may be folded inwardly upon itself to thereby rotate the attached uncreased extension inwardly about its hinge when the sidewalls and the bottom are collapsed, and an inwardly foldable one piece triangular creased extension located below the unattached edges of the first-named extensions and having two sides thereof hinged respectively to the two remaining sidewalls, whereby the unattached edges of the first named extensions will be supported by said triangular extension and prevented from collapsing outwardly, the crease line in said triangular extension substantially coinciding with the crease line in said diagonally creased extension when the container is in an erected position.

2. A collapsible container having four sidewalls and an inwardly foldable bottom, said bottom comprising an uncreased quadrilateral tab, substantially covering the area defined by the sidewall when the container is in erected position, said uncreased tab having one edge thereof hingedly secured to the lower edge of one of the sidewalls, a diagonally creased tab disposed below the uncreased tab and likewise substantially covering the area defined by the sidewalls when the container is in an erected position, said creased tab having one edge thereof hingedly secured to

the lower edge of an adjacent sidewall, the proximate faces of both of said tabs being attached together at a point between the crease line in said creased tab and the hinge line of said uncreased tab, whereby the creased tab will fold inwardly upon itself and thereby rotate the attached uncreased tab inwardly about its hinge when the sidewalls and bottom are collapsed, and an inwardly foldable, one-piece triangular creased gusset located below the free edges of said tabs and having two sides thereof hinged respectively to the two remaining sidewalls whereby the free edges of said tabs will be supported by said triangular gusset when the container is in erected position, the crease line in said triangular gusset substantially coinciding with the crease line in said diagonally creased tab when the container is in an erected position.

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