Aug. 4, 1925. 1,548,494

J. R. VAN WORMER

COLLAPSIBLE BOX

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FIG-1

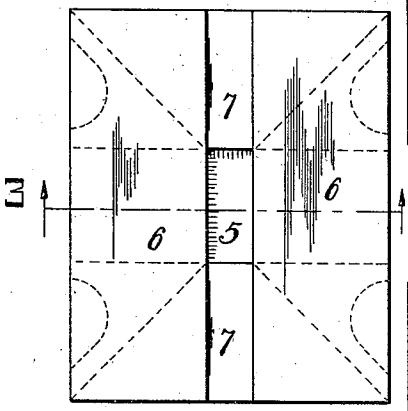


FIG-2

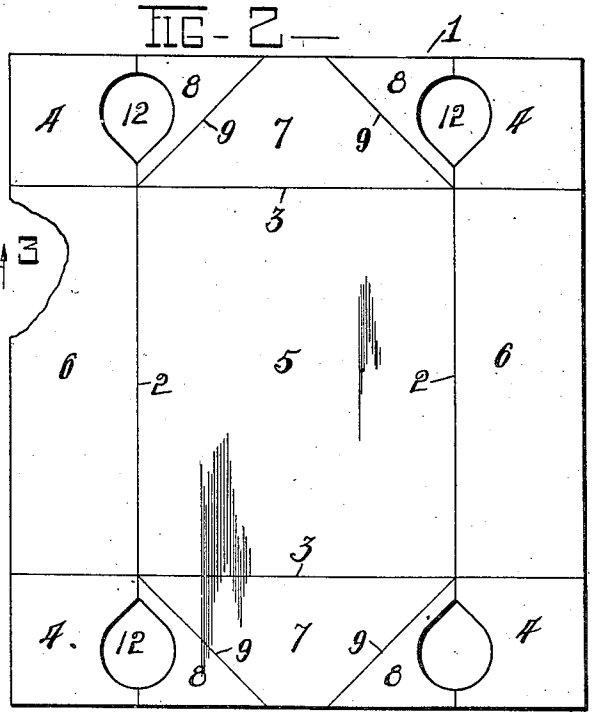


FIG-3



FIG-4

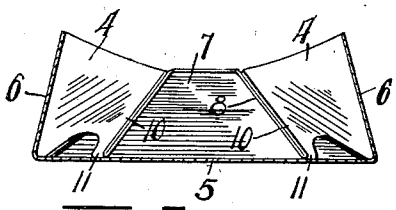


FIG-5

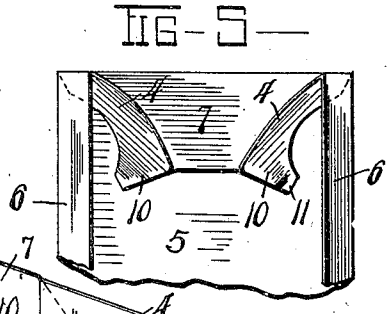
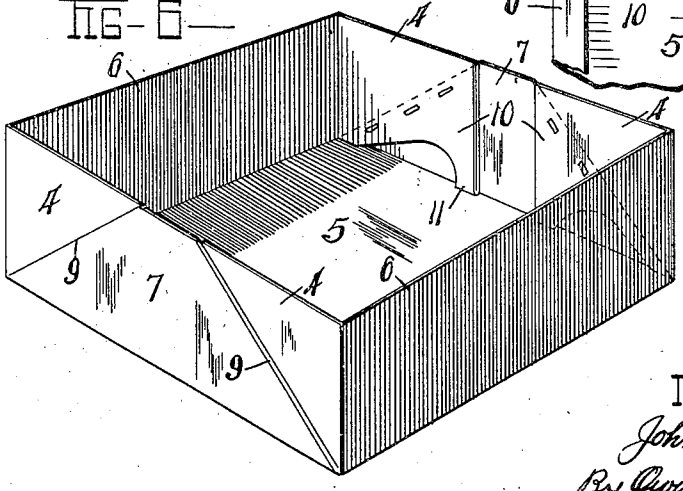


FIG-6



INVENTOR

John R. Van Wormer,

By Owen Owen & Crampton

Attys.

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J. R. VAN WORMER

COLLAPSIBLE BOX

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FIG-7

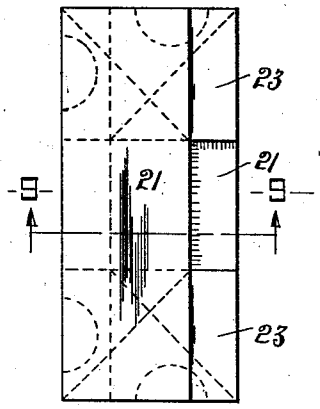


FIG-8

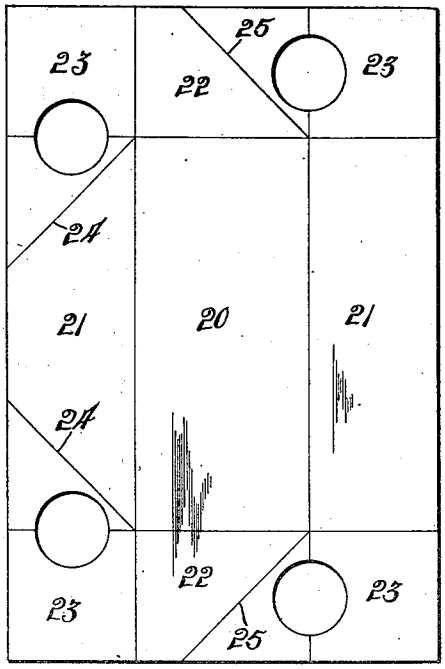


FIG-9

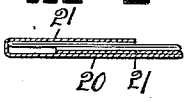


FIG-10

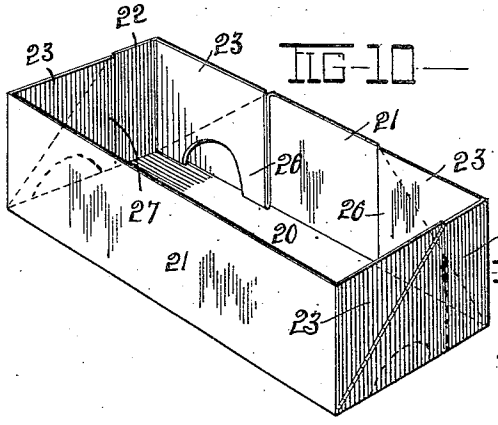


FIG-11

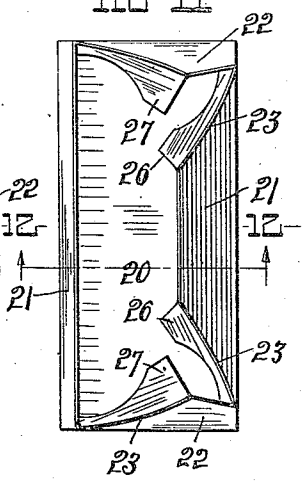
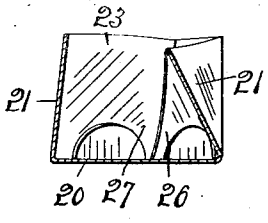


FIG-12



INVENTOR

John R. Vanwormer.

By Owen Owen & Crampton.

Attys.

Patented Aug. 4, 1925. 1,548,494

UNITED STATES PATENT OFFICE.

JOHN R. VAN WORMER, OF TOLEDO, OHIO, ASSIGNOR OF ONE-HALF TO GEORGE A. VRADENBURG, OF TOLEDO, OHIO.

COLLAPSIBLE BOX.

Application filed March 6, 1922. Serial No. 541,325.

To all whom it may concern:

Be it known that I, JOHN R. VAN WORMER, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have made an Invention Appertaining to Collapsible Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to containers of the collapsible type and particularly to boxes made of stiff paper or other similar or suitable material and used in connection with the packaging of numerous articles.

The object of the invention is the provision of a simple and efficient box or container of the character described, which is composed of a minimum of material scored and having certain of its panels overlapped and secured together in such manner as to provide a box member capable of being easily and quickly set up or collapsed and which is strong and durable in its construction and when set up is adapted to retain such position.

A further object of the invention is the provision of a box of the character described, comprising separable and interchangeable body and cover portions of like construction and size.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, two embodiments only thereof are illustrated in the accompanying drawings, in which,—

Figure 1 is a plan view in collapsed position of either the body or cover portion of a box embodying the invention. Fig. 2 is a plan view of a blank for forming the same with a part broken away. Figs. 3 and 4 are cross sections on the line 3—3 in Fig. 1 with the parts in different stages of opening movement. Fig. 5 is a fragmentary plan view of the box member in partially opened position. Fig. 6 is a top perspective view thereof in full open position. Fig. 7 is a plan view of a slightly modified form of box member in collapsed position. Fig. 8 is a plan of the blank thereof. Fig. 9 is a cross section on the line 9—9 in Fig. 7. Fig. 10 is a top perspective view of the member in full open position. Fig. 11 is a top view of the member partially collapsed, and Fig. 12 is a cross section on the line 12—12 in Fig. 11.

Referring particularly to Figs. 1 to 6 of the drawings, 1 designates a blank of rectangular form and preferably composed of pressed fiber or fiber board of a fairly stiff nature, but preferably not so stiff as to prevent a flexing thereof, the weight and quality of the material depending on the use to which the box is to be put.

If the blank is to form the body of a box of the telescoping type, as distinguished from a single piece box having the cover attached, or is to form the cover member of a box of the telescoping type, it is of rectangular form as shown and may vary in length and width to suit the shape of the box desired. The blank is formed adjacent to each of two opposite edges thereof, which may be termed the side edges, and in parallelism therewith with a scoring line 2 and adjacent to each of the other two opposite edges, which may be termed the end edges, and in parallelism therewith with a scoring line 3. The score lines 2 and 3 cross each other and extend at their ends to the respective edges of the blank to form the rectangular corner panels 4, and the lines 2 and 3 cooperate to form the bottom panel 5 and the side panels 6 at opposite sides of the bottom panel. Each end panel, which is formed by the intersecting score lines 2 and 3 at an end of the bottom panel 5, is divided into a main central panel 7 and at each end thereof with a triangular lapping panel 8 by inclined score lines 9 which extend from the inner corner angles of the end panel inwardly across the respective end panels at substantially a 45° angle to the adjacent lines 2 and 3 bounding the end panels, as shown.

The blank having been thus scored is formed into a box member by folding each end portion over the center and side panels 5 and 6 along the respective lines 3 throughout the entire length of such lines, and the side panels 6 and lapping corner portions 4 at the ends thereof are then folded over along the respective lines 2 to cause the panel 6 to lap the inner side of the bottom panel 5 and the corner panels 4 to lap th outer sides

of the adjacent end panels 8 and the adjacent end portions of the center end panels 7, as shown in Fig. 1. The portions of the corner panels 4 which lap the triangular end panels 8 are then secured to such panels by glue, staples or otherwise.

The panels 8 and lapped portions of the corner panels 4, which are rigidly secured together, cooperate to form a triangular tongue 10 at the inner side of each end of the box member, which tongue is hingedly connected to the center end panel 7 along the respective diagonal score line 9. When the ends and sides of the box member are in collapsed position the free edge 11 of each tongue 10 is disposed in the angle formed along the adjacent score line 2 between the bottom and side panels 5 and 6, and when the member is opened or the sides and ends thereof have been swung to upright position with respect to the bottom panel, the edge 11 of the tongues 10 swing over the respective corner portions of the bottom panel in contact therewith and to the angle formed at the score line 3 between the bottom panel 5 and adjacent end panel 7, with the inner sides of the tongues flat against the respective panels 7, as illustrated in Figs. 4, 5 and 6. It is thus evident that the tongues 10 are considerably stiffer than the remainder of the box due to their being formed by a double thickness of the material forming the box, and that they serve as bracing members which coact at their free edges 11 with the bottom panel 5 of the box and serve to retain the box sides and ends in upright position.

To set up a box member when in collapsed position, it is merely necessary to grasp the free edges of the panels 7, which are then disposed adjacent to each other, and swing them upward and outward to the upright positions shown in Fig. 6, and to collapse the box when in set up position it is merely necessary to grasp the placing tongues 10 near their free edges 11 and swing them inward and toward the sides 6, which movement causes a slight flexing of the tongues and panels 4, as shown in Figs. 4 and 5, due to the tension which is set up during such movement and causes an inward folding or collapsing of the sides and ends.

The free edges 11 of the tongues 10 are preferably notched or cut away, as shown, so that when the box member is in flat collapsed position the tendency of the tongue edges 11 to space the bottom and side panels adjacent the point of connection thereof will be limited, and thereby lessen the liability of breaking the edges of the box along the fold line 2 when the sides are pressed down flat over the tops 10. The notches are formed by providing openings 12 in the blank at the points shown.

In forming a collapsible box member embodying my invention it is not necessary to dispose the tongues 10 at opposite sides or ends of the member, as disclosed in Figs. 1 to 6, but two of the tongues may be formed at one side and a single tongue provided at each of the adjacent sides or ends, in which latter case the single tongues, where the box is in set-up position, have their free upright ends projecting toward the side embodying the pair of tongues, as shown in Figs. 7 to 12. This latter construction is used where a box is of narrow oblong construction, such for instance, as a box similar in form to a shoe box, as in such case an end of the box is not sufficiently wide to accommodate two tongues.

In the modified form of box 20 designates the bottom panel, 21 the two side panels, 22 the two end panels and 23 the corner panels. One side panel 21 is formed with the inclined scorings 24 extending from the inner corner angles of the panel 21 at substantially a 90° angle. Each end panel 22 is provided with a single inclined scoring line 25 extending at substantially a 90° angle from the inner corner of the end panel which is remote from the side panel having the scorings 24. In forming the box the side 21 having the scorings 24, together with the adjacent corner panels 23 are folded over the bottom and end panels 20 and 22. The end panels 22 and adjacent corner panels 23 are then folded over the adjacent end portions of the sides and of the bottom panel 20, and the corner panels 23 are pasted or otherwise secured to the triangular panel portions at the outer sides of the inclined lines 24, thus forming side tongues 26. The side panel 21 which is opposed to the side panel carrying the tongues 26, together with the adjacent corner panels 23, is then folded over the adjacent side portion of the bottom panel 20 and the outer sides of the folded end panels, and the corner panels are pasted or otherwise secured to the triangular end panel portions disposed at the outer sides of the inclined lines 25, thereby forming a tongue 27 at each end. The tongues 26 and 27 have the same bracing and folding actions with respect to the respective side or ends with which associated as do the tongues 10 of the other form.

An unfolding or setting up movement of the modified form of box is effected by an outward swinging of the two opposed sides 21 and thus causing an outward swinging of the ends and positioning of the tongues 26 and 27 in the bracing positions shown in Fig. 4.

Two box members of like size, or made from duplicate blanks, may be employed in forming a box, one member being telescoped over the other. It is not necessary to have the cover or outer telescoping member slight-

ly larger than the other as the tendency of the upper edge of the sides and ends to slightly incline inwardly enables the cover member to be easily telescoped over the bottom member.

I wish it understood that my invention is not limited to any particular construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claim.

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

A collapsible box comprising a bottom portion, side and end walls connected thereto, and rectangular tabs on the ends of said side walls, the edges of the tabs and end walls being continuous and uncut, said end walls being folded inwardly upon themselves on a diagonal line inclined away from the adjacent side walls, and a portion of the outer side of said tabs being adhesively connected to the exposed surface of the adjacent folded portion of the end walls to form bracing tongues whereby when the box is unfolded the tabs and folded portions are on the inside thereof and cooperate with the bottom portion to hold the walls in upright position and when collapsed the tabs are folded inwardly against the respective sides, said tabs remaining flat and unfolded in both positions.

In testimony whereof, I have hereunto signed my name to this specification.

JOHN R. VAN WORMER.