May 1, 1951 W. A. RINGLER 2,551,164

REINFORCED KNOCKDOWN BOX

Filed Sept. 6, 1946

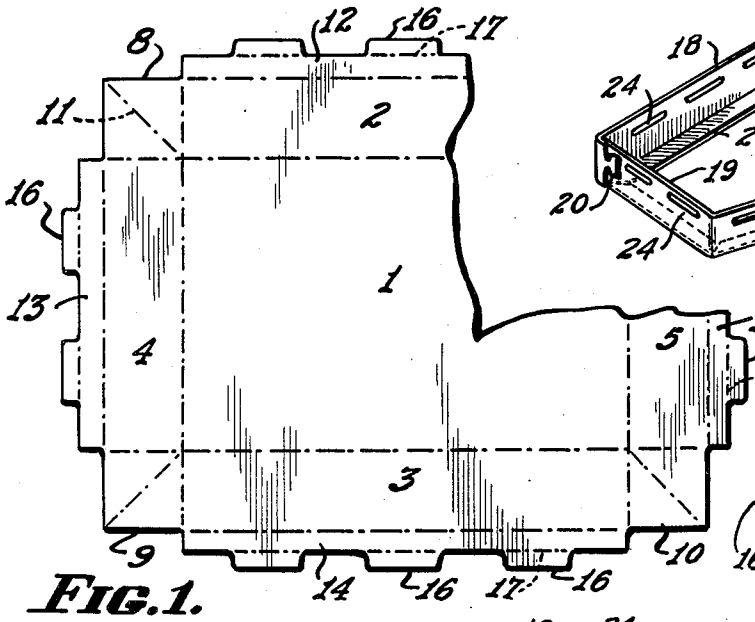

FIG. 1.

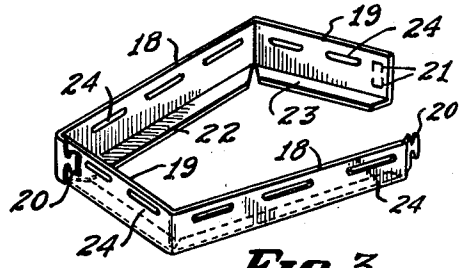

FIG. 3.

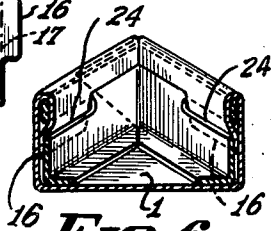

FIG. 6.

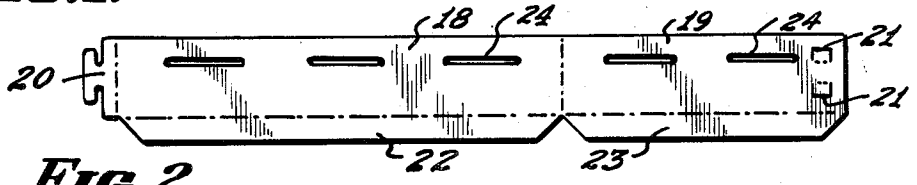

FIG. 2.

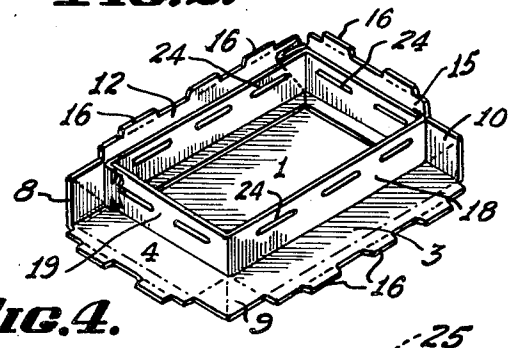

FIG. 4.

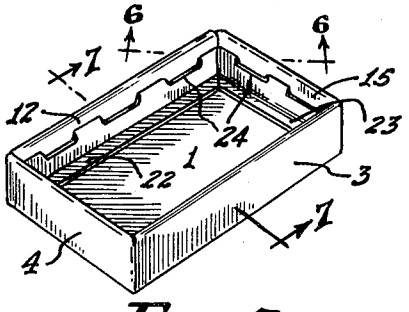

FIG. 5.

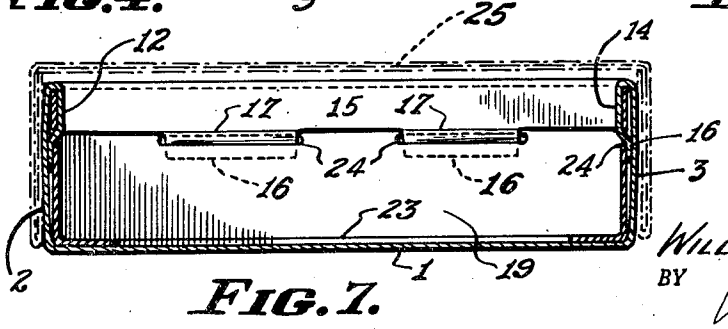

FIG. 7.

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UNITED STATES PATENT OFFICE

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REINFORCED KNOCKDOWN BOX

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1 Claim. (Cl. 229—23)

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My invention relates to knock-down or folding paperboard boxes, especially large sized boxes, having a reinforced construction whereby the boxes are made readily able to withstand the strains of handling, shipment and storage, in spite of contents of considerable bulk and weight. While the specific size and shape of the box is not a limitation on the invention, I shall describe an exemplary embodiment which is a two-piece box for folded blankets or similar articles.

Large, knock-down or collapsible boxes have hitherto been made in various constructions for blankets and the like; and the need has been felt for greater strength in such boxes. This need cannot be met merely by making the box of heavier paperboard, since there is a limit in this direction. With boxes of very large size it is not always practicable to go to various double-wall glued constructions, and little is to be gained in this direction in any event because the point of initial weakness in such boxes is at the corners. In smaller cartons, particularly of the tubular variety, the use of a separate, interior, reinforcing sleeve has been suggested; but such an expedient is not available in the field of this invention. A separate sleeve is not only unsightly, but it has a tendency to come out with the contents. Moreover, in two piece boxes, such a reinforcement can be used only on the inner or bottom part of the structure.

It is an object of this invention to provide a reinforcement applicable both to the top and bottom members, where desired, of a two-piece box, so that the maximum reinforcement can be obtained.

It is an object of my invention to provide a box in which the reinforcement is held captive, is not liable to dislodgement, has no tendency to come out with the contents, and presents no projections to catch upon or tear the contents of the box.

It is an object of my invention to provide a reinforced box which on the inside as well as the outside presents a neat, attractive and finished appearance.

It is an object of my invention to provide a reinforcement which acts to strengthen not only the walls of the box but the corners or end edges and the side edges as well.

It is an object of my invention to provide a reinforcement which where desired, becomes an integral element of the structure of the box, having a function in maintaining the box in erected condition and enabling me to use knock-down box structures requiring no initial folding, gluing, or stitching to produce the knock-down form of the structure, and which are easily erected by hand.

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It is an object of the invention to attain the advantages above in structures which are economical to produce and to use.

These and other objects of the invention which will be set forth hereinafter or will be apparent to one skilled in the art upon reading these specifications, I accomplish by that construction and arrangement of parts of which I shall now describe the aforesaid exemplary embodiment. Referring to the drawings which form a part hereof:

Fig. 1 is a partial plan view of a blank for one of the members of my exemplary box.

Fig. 2 is a plan view of one portion of the reinforcing structure.

Fig. 3 is illustrative of steps in the operation of setting up the reinforcement.

Fig. 4 is a perspective view illustrative of operations in setting up the box element around the reinforcement.

Fig. 5 is a perspective view of the reinforced box member in fully erected condition.

Fig. 6 is a partial sectional view taken along the line 6—6 in Fig. 5.

Fig. 7 is a transverse sectional view taken along the section line 7—7 in Fig. 5. This figure shows also in dotted lines the assembly of both box elements of a two piece box construction.

Referring to Fig. 1, I have shown the blank for the main element of one member of my exemplary two piece box. This blank is made by cutting and scoring (and printing if desired) suitable boxboard in such fashion as to provide a main panel 1 to which are articulated end walls 2 and 3 and side walls 4 and 5. The ends of the side and end walls respectively are connected by web members, three of which are shown at 8, 9, and 10. These web members are diagonally scored as shown in dotted lines at 11 so that they may fold bellows-wise when the side and end walls are erected with respect to the main panel.

To the free edges of the side and end walls, I articulate relatively narrow flaps 12, 13, 14, and 15 which are provided substantially throughout their length with a series of spaced shallow tongues 16. It is contemplated that the spaces between these tongues will be substantially as long as or longer than the tongues themselves. Where a board from which the blank of Fig. 1 is made is of heavy caliper or is difficult to bend, I may provide lines of score 17 along the bases of the tongues.

It will be clear that the blank of Fig. 1 may be erected into box or tray form with the webs folded on their diagonal score lines into triangular ears which can be caused to lie inwardly of the side or end walls as desired. There is however in the structure of Fig. 1 nothing to hold the box in erected condition. For this purpose, I rely on the coaction of portions of a main box element and an interior reinforcement which takes the form of a band. The band reinforcement may if desired be made in the form of a one piece tubular element, i. e. a band construction including four enclosing body walls and an attachment means which may be a glue flap. For very large boxes a one piece band becomes excessive as to length and involves a difficult hand or machine tubing operation. For this reason I prefer to make my band in two or more pieces such as are illustrated in blank form in Fig. 2. Here I have shown a paperboard member having a side wall portion 18 and an end wall portion 19 in articulation. One of these members has articulated to it an attachment tongue 20 preferably provided with locking tabs while the other portion is provided with locking slits indicated at 21 to accept the tabs. I am not limited to this construction since other engagement means may be employed including the use of glue tabs and the effecting of union by adhesion, by stitching or otherwise. It is an advantage of my preferred construction that no such operations are required, either in the manufacture of the box or in setting it up. Along one edge of both the side wall 18 and the end wall 19, I articulate flaps 22 and 23. A series of slits or slots 24 of the same length as the tongues 16 are formed at appropriate positions in the side and end walls of the reinforcement and at a distance from their free edges substantially equivalent to the width of the flanges 12, 13, 14, and 15. In forming a reinforcing band, two of the members illustrated in Fig. 2 will be employed, these being joined together in the erected structure after the manner illustrated in Fig. 3, the flanges 22, 23 being bent over as shown.

In setting up the box element, the erected band member may be placed on the main panel 1 of the blank of Fig. 1. Then the side and end walls of the blank may be bent upwardly so as to parallel and lie against the side and end walls of the reinforcement. The corners will be folded bellows-wise, with the bellows folds lying inside the side or end walls of the box. The flanges 12, 13, 14, and 15 are bent over inside the corresponding walls of the reinforcement; and the tongues 16 are inserted through the slits or slots 24 of the reinforcement. This results in maintaining the erected condition of the side and end walls 2, 3, 4, and 5 of the main blank element. The reinforcement thus becomes an integral part of the structure of the box, serving to maintain

its erected condition as well as to provide reinforcement. Adequate reinforcement is provided at the corners of the box because the band is continuous at these portions, and the side and end edges of the box are also reinforced by the band and its flanges 22 and 23. The bellows folds are entirely concealed; the interior construction of the box is neat and finished in appearance, and there is nothing upon which the contents in the box can catch. The reinforcement is securely fastened in place and cannot be dislodged from the box member by handling or by inverting the structure. As a consequence the same construction may be employed for the top member of a two piece box which will be used in the inverted position and which will telescope over the bottom member. This is illustrated in Fig. 7 where a top member is indicated at 25. It may be exactly the same in construction as the bottom member which has been described in detail, differing only in such matters of dimension as will permit the telescoping action aforesaid. Modifications may be made in my invention without departing from the spirit of it. Having thus described my invention in one exemplary embodiment, what I claim as new and desire to secure by Letters Patent is:

In combination in a box, a blank comprising a main panel, end and side walls articulated to edges of said main panel, bellows-folding webs connecting ends of the end and side walls respectively, relatively narrow flanges articulated to the edges of the end and side walls, said flanges bearing spaced tongues, and a separate reinforcement in the form of a continuous band having side and end walls corresponding in dimension to the side and end walls of said blank, said reinforcement adapted to rest upon the main panel of said blank about the periphery thereof, the side and end walls of said reinforcement having slits therein to accept said tongues when the flanges are bent over inwardly of the side and end walls of said reinforcement, with said webs folded bellows-wise and disposed between said reinforcement and said outer side or end walls, said reinforcement through the medium of said tongues and flaps serving to maintain the erected condition of said box.

WILLIAM A. RINGLER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
130,963	Weston	Aug. 27, 1872
618,468	Knobeloch	Jan. 31, 1899
622,496	Knobeloch	Apr. 4, 1899
1,917,496	Claff	July 11, 1933
2,148,048	Gray	Feb. 21, 1939