Feb. 23, 1943. M. NOAH ET AL 2,311,857

REINFORCING MEANS FOR FOLDING BOXES

Filed Aug. 31, 1940

Fig. 1.

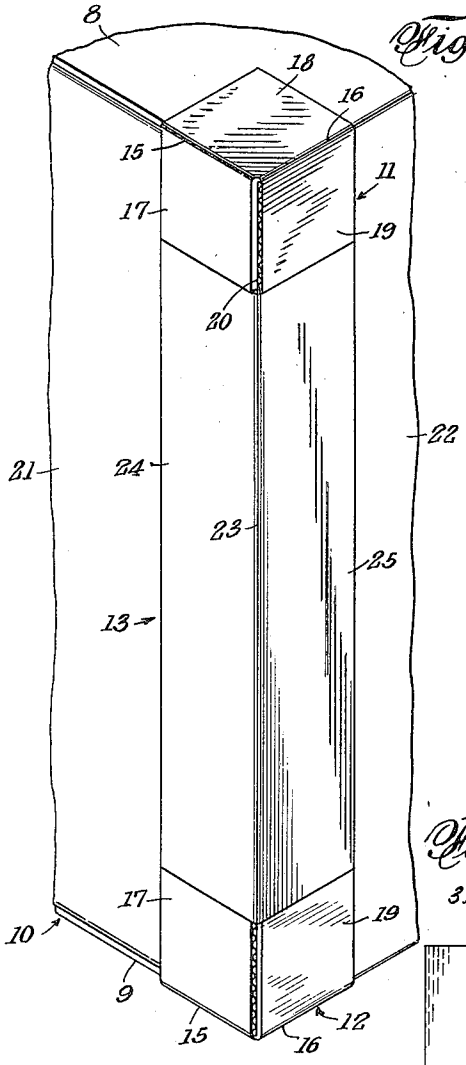


Fig. 3

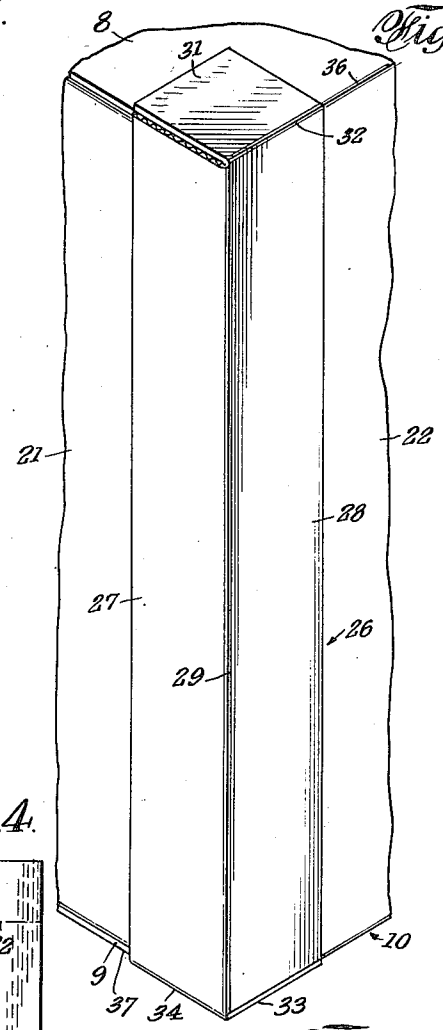


Fig. 4.

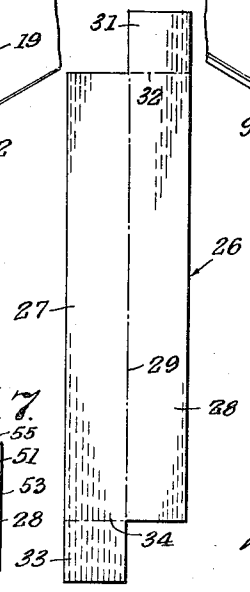


Fig. 2.

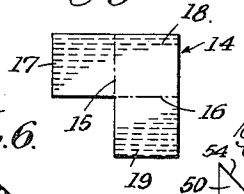


Fig. 5.

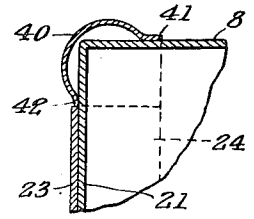


Fig. 6.

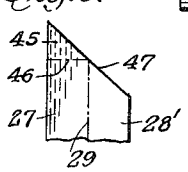
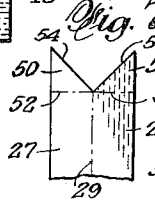


Fig. 7.



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REINFORCING MEANS FOR FOLDING BOXES

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4 Claims. (Cl. 229—49)

This invention relates to improvements in reinforcements for conventional paper-board boxes and more particularly to corner or edge-reinforcing strips for rectangularly-shaped corrugated paper-board folding boxes.

It is an object of the present invention to provide very simple, economical, efficient and practical reinforcing means for the meeting edges of the sides and the corners of paper-board boxes, capable of withstanding pressure and shock during transportation of other handling of the box and permitting stacking and rough handling or the filled box without injury to the box or its contents, particularly if the contents comprises fragile articles, such as, glassware or earthenware.

It is a further object of the present invention to provide as a new article of manufacture, corner or edge reinforcements for rectangular conventional paper-board boxes, which reinforcements are made of corrugated paper-board and which are easily applied to the corners or edges of such box for equipping the same with cushioning and strengthening means at locations where reinforcements are required in order to prevent possible collapse, breakage or distortion of the box during handling thereof.

The invention permits of the use of a lightweight paper-board box since the application of corrugated paper-board reinforcements thereto adds considerably to the strength and resiliency of the box, particularly at the edges or corners thereof.

In dealing with corrugated and other paperboard cartons or boxes employed for containing and carrying such relatively weighty articles as glass jars, crockery and other fragile articles, it is usually found that the material of the box is not sufficiently strong to resist shocks and wear occurring during transportation thereof. It, therefore, is necessary to employ reinforcing means for the box of such character and construction as will permit the box to withstand rough handling and shocks, prevent it from bursting and save the contents of the box from breakage. Such reinforcing means must not only act as a cushioning medium to take up any force or blow which may be applied to or received by the box, but also as a means to maintain the box in a stable, firm and rigid condition to prevent its distortion and bursting resulting from impact or the weight of the articles in the box or both. To satisfy these requirements and to overcome the disadvantages of heretofore existing reinforcing tapes and other devices, the reinforcing means should preferably comprise an integral strip of corrugated paper-board having scores dividing and for folding the strip into panels adapted to embrace lateral side and top and/or bottom portions of the box adjacent meeting edges thereof and to cover corners formed by such meeting edges, the reinforcing strips being preferably provided with means for readily applying thereof to the box.

A still further object of the present invention resides in the provision of a corrugated reinforcing member, as a new article of manufacture, which may be readily applied to each of the lateral corners of a paper-board box and extended over corner portions of the top and bottom of the box and in engagement therewith whereby the box is rendered firm, rigid and strong, and is safeguarded against twisting and distortion, due to the weight of the contents therewithin, when the box is being lifted or carried.

To carry out the above object the reinforcing member may comprise hingedly connected panels arranged such that two of the panels are coextensive in length and separated by a score forming the hinge about which they are folded for securement to adjacent vertical sides and over the corner formed thereby, and at least two panels hingedly connected respectively, at opposite ends of one or of the other, or at one end of one and at opposite end of the other, of the former panels and coextensive in width with its connected panel and separated therefrom by a score forming the hinge about which it is folded for securement to the top and the bottom respectively, of the box and over corners formed by one of the sides and the top and the bottom respectively, of the box.

The above and further objects and advantages of invention will appear from the following disclosure thereof, together with the attached drawing which illustrates certain forms of embodiment of the invention, and in which:

Fig. 1 is a perspective view of a portion of a corrugated paper-board box having applied to corners thereof a form of reinforcement made in accordance with the invention;

Fig. 2 is a flat plan view (reduced scale) of one of the reinforcing corners shown in Fig. 1;

Fig. 3 is a view similar to Fig. 1, but showing the invention in a modified form;

Fig. 4 is a flat plan view (reduced scale) of the reinforcing means shown in Fig. 3; and

Fig. 5 is a sectional view of a corner portion of a box including a further modified form of reinforcing means made in accordance with the invention.

Figs. 6 and 7 are flat views (on a reduced scale) of portions of reinforcing means embodying the invention in further modified forms.

Referring now more particularly to the drawing, there is disclosed a substantially rectangularly-shaped conventional paper-board folding box 10 to which is applied upper and lower reinforcing members 11, 12 and an intermediate

reinforcing member 13. Box 10 is preferably made of corrugated material.

The upper and lower reinforcing members 11, 12 are made from the corrugated paper-board blank shown in Fig. 2 and indicated by the numeral 14, to which is applied the scores or creases 15, 16 forming the hinges about which the blank is folded to constitute the reinforcing members 11 or 12. Thus the latter members 11, 12 each comprise three hingedly connected panels 17, 18, 19; the panels 17 and 18 being separated by the score or hinge line 15, and the panels 18 and 19 being separated by the score or hinge line 16. Blanks 14 are preferably coated on one face with an appropriate adhesive and after being bent along the fold lines or scores 15, 16, are applied to the top and bottom corner portions of the box 10 as clearly shown in Fig. 1. Of the upper member 11, the panel 18 is secured to the top 8 of the box, and of the lower member 12, the panel 18 is secured to the bottom of the box. The panels 17, 19 of each member 11, 12 are secured respectively to the sides 21, 22. Between the reinforcing members 11, 12 and over the edge or corner 20 formed by the adjacent vertical sides 21, 22 of the box and over portions of the latter is disposed the intermediate reinforcing member 13. Reinforcing member 13 is made of a strip of corrugated paper-board provided with the vertical crease or score line 23 separating the strip into the panels 24, 25 and constituting the hinge about which the strip is folded for securement to the sides 21, 22 of the box. In lieu of an adhesive any other suitable means may be employed, such as rivets or staples (not shown) for securing the reinforcing members 11, 12 and 13 to box 10.

Instead of having the reinforcing means each comprised of three elements or members 11, 12 and 13, the same may constitute an integral structure as shown in Figs. 3 and 4. Figure 4 shows the scored blank 26 from which the reinforcing means is formed. From blank 26 is formed the coextensive vertical panels 27, 28 separated by the score line 29 forming the vertical hinge connection 29 of Fig. 3 about which the panels are folded and secured to the sides 21, 22 of the corrugated box 10, the upper panel 31 which is hingedly connected to the upper end of lateral panel 28 by the horizontal fold line or score 32 and the lower panel 33 which is hingedly connected to the lower end of lateral panel 27 by the horizontal fold line or score 34. Panel 31 is folded on score 32 and secured to the top wall 8 over corner 36 of box 10, and panel 33 is folded on score 34 and secured to the bottom wall 9 over corner 37 of box 10.

Although it appears to be more practical to provide a panel 31 or 33 as an extension of each of the vertical panels 27, 28, in which case the upper horizontal hinge reinforces the corner or edge formed by the top wall and one of the vertical sides and the lower horizontal hinge reinforces the corner or edge formed by the bottom wall and the other adjacent vertical side, of the box, it is understood, however that the panels 31, 33 may form extensions of either panel 27 or 28.

There has thus been provided by this invention the combination with a paper-board box having when closed a corner portion comprising three-exposed intersecting edges, two of which edges are substantially in the same plane, and the third of which edge is in a plane at a right angle to the said same plane, of a reinforcing strip 14 or 26 comprising a corrugated paper-board member having three integral substantially rectangular panels 17, 18 and 19 (Fig. 2) or 27, 28 and 31 (Fig. 4), two of the panels 17, 18 or 27, 28 being arranged in lateral relation and integrally connected together along a fold line 15 or 29 and together forming an elongated substantially rectangular portion having said fold line 15 or 29, the third (19 or 31) of said panels extending at right angle from said elongated portion and integrally connected to one only (18 or 28) of said two of said panels along a fold line 16 or 32 extending the entire width of said panel 18 or 28, the fold lines 15 and 16 or 29 and 32 being arranged at right angles to each other, whereby when the strip is folded along the said fold lines and superimposed upon the corner portion of the box, adjacent of the panels are angularly disposed in relation to each other with the fold lines covering respectively two of the intersecting edges of the corner portion to their points of intersection and one of the panels extends substantially coincident with the third of the intersecting edges.

In the embodiment shown in Fig. 4, one end of the panel 27 lies adjacent the third panel 31, the other end of the panel 27 having integrally joined therewith along the fold line 34 extending its entire width a fourth substantially rectangular panel 33, the panels 31 and 33, when the strip is folded in operative position, lying against the opposite ends 8 and 9 of the box adjacent opposite corners and the remaining panels 27 and 28 lying against the adjacent sides 21, 22 of the box and reinforcing the same.

The reinforcing means above described are secured to the box at each one of the four vertical meeting edges or corners of the sides of the box and over the adjacent portions of the top and bottom walls of the box.

Figs. 6 and 7 show the invention in further modified forms. In Fig. 6 a triangularly-shaped panel or flap 45 is shown which is connected to the vertical panel 27 by the score or hinge line 46. The diagonal edge 47 continues below the hinge 46. The strip is folded along the hinge or score lines 29 and 46 and when applied to the box 10, the triangularly-shaped flap 45 will rest on the top 8 of the box, similarly to flaps or panels 18 of Fig. 1 and 31 of Fig. 3. The vertical panel 28' will have a cut-out portion defined by the portion of the diagonal edge 47 below the score line 46. This construction affords a very simple arrangement from a manufacturing standpoint.

In Fig. 7 the flaps or panels 50, 51 are likewise triangular, and are arranged so that their outer vertical edges are coincident with the outer vertical edges of the panels 27 and 28, respectively. The score or hinge lines 52, 53 are coincident, the flap 50 being folded at 52 and the flap 51 being folded at 53. When the strip is folded on the line 29 the diagonal edges 54, 55 of the respective flaps 50, 51 will meet and thus provide a substantially rectangularly-shaped upper portion for securement to top 8 of the box.

The structures above described provide very efficient, practical and economical reinforcing means for paper-board including corrugated boxes capable of rendering the box rigid and firm and preventing distortion thereof when filled with weighty articles, such as glassware, as well as providing cushioning means where most required.

Fig. 5 shows the invention in a still further modified form. The corner member or strip 23 may be similar to or like the member 23 of Fig.

1. Instead of the upper and lower members being rectangular in shape as indicated by 11 and 12 of Fig. 1, these members may have arcuate cushioning walls 40 terminating in flat ends 41, 42. Although the drawing, and the above specification disclose the best modes in which we have contemplated embodying the invention, we desire in no way to be limited to the details of such disclosure, for in the further practical application of the invention many changes in the forms and proportions may be made as circumstances require or experience suggests without departing from the spirit of the invention within the scope of the appended claims.

Having thus described the invention what is claimed as new and desired to secure by Letters Patent, is:

1. The combination with a paper-board box having when closed a corner portion comprising three exposed intersecting edges, two of which edges are substantially in the same plane and the third of which edges is in a plane at a right angle to said same plane, of a reinforcing strip adhesively secured to said box and applied completely to the outside of said box, said strip comprising a corrugated paper-board member having three integral substantially rectangular panels, two of said panels being arranged in lateral relation, and integrally connected together along a fold line and together forming an elongated substantially rectangular portion having said fold line, the third of said panels extending at a right angle from said portion and integrally connected to one only of said two of said panels along a fold line extending the entire width of said one only panel, the said fold lines being arranged at right angles to each other, whereby when said strip is folded along said fold lines and superimposed upon said corner portion, adjacent of said panels are angularly disposed in relation to each other with said fold lines covering respectively two of said intersecting edges of said corner portion to their points of intersection and one of said panels extends substantially coincident with the third of said intersecting edges, said strip having only three panels superimposed upon said corner portion.

2. The combination with a paper-board box having when closed opposite ends adjacent opposite corners and adjacent sides, a reinforcing strip adhesively secured to said box and applied completely to the outside of said box, said strip comprising a corrugated paper-board member having three integral substantially rectangular panels, two of said panels being arranged in lateral relation and integrally connected together along a fold line and together forming an elongated substantially rectangular portion having said fold line, the third of said panels extending at right angle from said portion and integrally connected to one only of said two of said panels along a fold line extending the entire width of said one only panel, the said fold lines being arranged at right angles to each other, one end of the other of said two of said panels lying adjacent said third panel, the other end of the other of said two of said panels having integrally joined therewith along a fold line extending its entire width a fourth substantially rectangular panel, said third panel and said fourth panel, when said strip is folded in operative position, lying flat against said opposite ends of said box adjacent opposite corners, and said remaining panels lying against said adjacent sides of the box and reinforcing the same, said strip constituting only three panels superimposed upon the adjacent sides and end of the box forming each of said corners.

3. The combination with a paper-board box having when closed opposite ends adjacent opposite corners and adjacent sides, a reinforcing strip adhesively secured to said box and applied completely to the outside of said box, said strip comprising a corrugated paper-board member having three integral substantially rectangular panels, two of said panels being arranged in lateral relation and integrally connected together along a fold line and together forming an elongated substantially rectangular portion having said fold line, the third of said panels extending at right angle from said portion and integrally connected to one only of said two of said panels along a fold line extending the entire width of said one only panel, the said fold lines being arranged at right angles to each other, said third panel being disposed at one end of said portion, and a fourth panel disposed at the other end of said portion and integrally connected to one only of said two of said panels along a fold line extending the entire width thereof, said latter fold line being arranged at a right angle to the fold line of said portion, said third panel and said fourth panel, when said strip is folded in operative position, lying flat against said opposite ends of said box adjacent opposite corners, and said remaining panels lying against said adjacent sides of the box and reinforcing the same, said strip constituting only three panels superimposed upon the adjacent sides and end of the box forming each of said corners.

4. The combination with a paper-board box having when closed a corner portion comprising three exposed intersecting edges, two of which edges are substantially in the same plane and the third of which edges is in a plane at a right angle to said same plane, of a reinforcing strip secured to said box and applied completely to the outside of said box, said strip comprising a corrugated paper-board member having three integral substantially rectangular panels, two of said panels being arranged in lateral relation, and integrally connected together along a fold line and together forming an elongated substantially rectangular portion having said fold line, the third of said panels extending at a right angle from said portion and integrally connected to one only of said two of said panels along a fold line extending the entire width of said one only panel, the said fold lines being arranged at right angles to each other, whereby when said strip is folded along said fold lines and superimposed upon said corner portion, adjacent of said panels are angularly disposed in relation to each other with said fold lines covering respectively two of said intersecting edges of said corner portion to their point of intersection and one of said panels extends substantially coincident with the third of said intersecting edges, said strip having only three panels superimposed upon said corner portion.

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