July 28, 1953 C. E. CLAFF ET AL 2,646,914

REINFORCED TRAY

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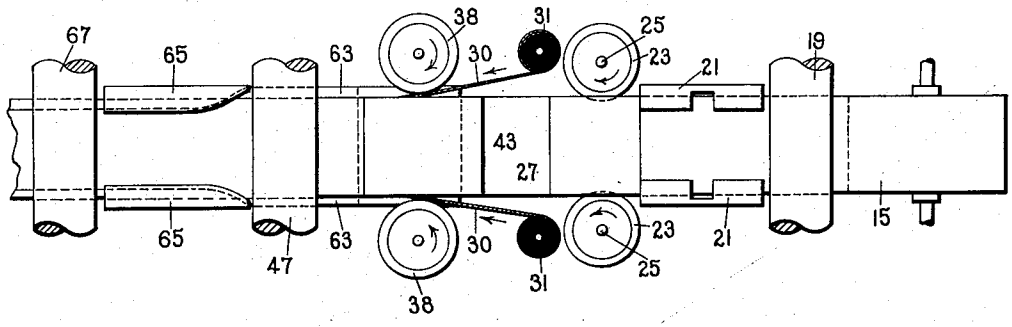


Fig. 1

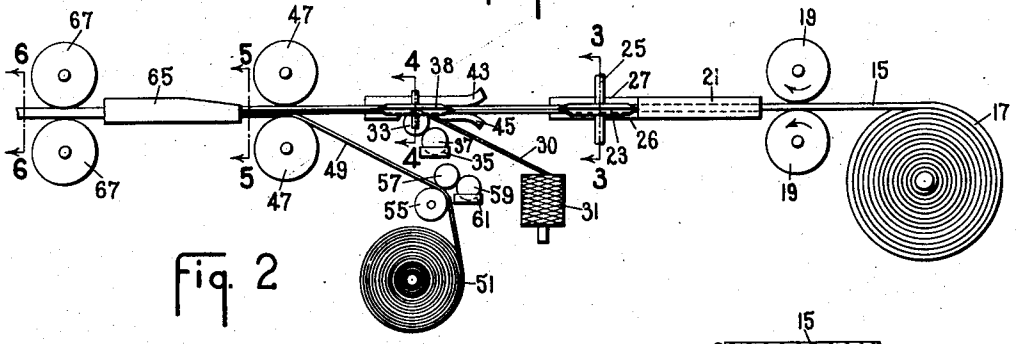


Fig. 2

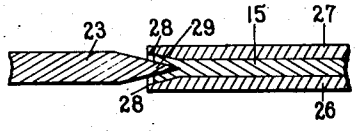


Fig. 3

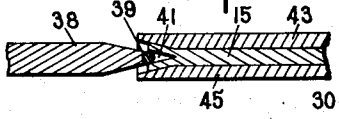


Fig. 4

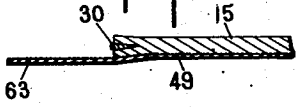


Fig. 5

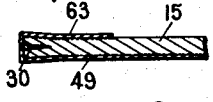


Fig. 6

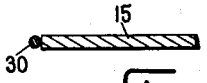
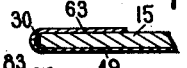


Fig. 7



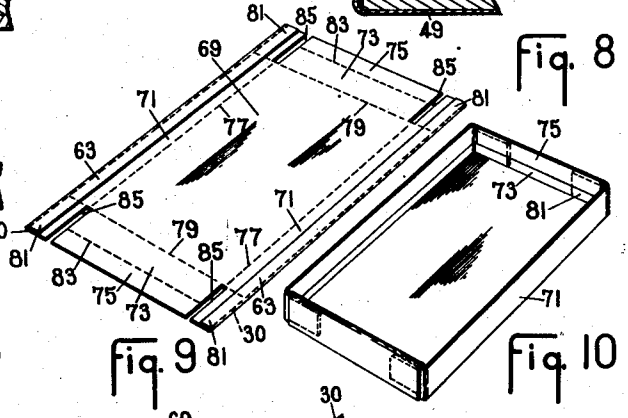


Fig. 8

Fig. 9

Fig. 10

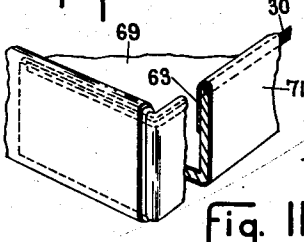


Fig. 11

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REINFORCED TRAY

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2 Claims. (Cl. 229—32)

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The present invention relates to the manufacture of boxes or cartons from pasteboard or the like, and more particularly to the construction of the box and the blank from which it is formed, and to the machine for producing the blank.

Some types of boxes or cartons, such, for example, as boxes in which shoes are customarily packed and stored on the shelves of the retail dealer, are subjected in use to excessive strain at the corners, due to the common practice of shoe salesmen of drawing the box outwardly from the store shelf, and often from beneath other boxes stacked above, by inserting one or more fingers downwardly within the box or upwardly within the cover, and pulling against the front wall of the box or cover. This puts a heavy strain on the front top corners of the box or the bottom front corners of the cover, with the result that the boxes and covers are frequently torn at one or both front corners.

One of the objects of the present invention is to provide a box or cover which is reinforced at such corners to withstand strains to which these parts are subjected in use.

A further object of the invention is to provide a reinforced blank from which such boxes may be made.

Still another object of the present invention is to provide a machine for producing reinforced blanks.

With these objects in view, the present invention comprises a box or cover having a reinforcing thread or cord secured to the free edges of the sides and ends of the box or cover adjacent the corners.

The invention further consists in a blank of cardboard or other suitable material having a thread or cord secured to and extending along the sides of the blank adjacent to where the corner will be formed in the finished box or cover.

The invention further consists in a machine for applying and securing a reinforcing thread or cord to the edges of the web of box material and thereafter forming the individual box blank from the combined web and reinforcing cord.

Preferably the opposite edges of the web of box material are cut or split inwardly a short distance to form a cleft or seat to receive the cord to which adhesive has been applied, and a cover paper is adhesively secured to the opposite marginal surfaces of the web, passing tightly around the cord seated in the cleft. If desired, however, the splitting of the edge of the web may be omitted and the adhesively coated cord applied directly to the unsplit edge with cover paper passing around the cord and secured to the opposite margins of the web.

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In the accompanying drawings, which illustrate more or less diagrammatically the present invention, Fig. 1 is a top plan view and Fig. 2 is a side elevation of the machine for slitting the edges of the web of box blank material and laying the reinforcing cord in the slit thus formed, and applying the web of cover paper to one face of the cardboard web, and for folding the same over and around the cord and onto the opposite face of the cardboard to provide a composite web of cardboard, re-inforcing cord and cover paper preparatory to the forming of individual blanks therefrom; Fig. 3 is a vertical, transverse, section on line 3—3 of Fig. 2, showing a portion of a slitting knife for slitting the edge of the pasteboard web as it advances between the top and bottom plates or supports; Fig. 4 is a vertical, transverse, sectional view taken on line 4—4 of Fig. 2, showing a portion of the cord-guiding roll laying the cord in the cleft in the margin of the pasteboard web; Fig. 5 is a vertical transverse, sectional view on line 5—5 of Fig. 2, showing a side margin of the pasteboard web with the cord positioned in the cleft and the cover paper applied to the lower face of the cardboard web and extending marginally therefrom, preparatory to being folded around the edge of the pasteboard and cord and onto the top face of the cardboard; Fig. 6 is a transverse sectional view of the cardboard web, reinforcing string and cover paper in final assembled position; Fig. 7 is a sectional view of a modification of the invention in which the adhesively coated cord is applied directly to the edge of the unsplit pasteboard web, and Fig. 8 shows in section the cover paper on the lower face of such web and wrapped around the cord and secured to the top marginal face; Fig. 9 is a perspective view of the finished blank suitable for a box cover, and Fig. 10 is a similar view of a cover formed from the blank of Fig. 9; Fig. 11 is a perspective view, partly in section and on an enlarged scale, of a corner of the box cover with the side and bottom cut away to show the internal construction.

In the machine of Figs. 1 and 2, the web of cardboard 15 is supplied from a roll 17, from which it is drawn by the power driven feed rolls 19. From the feed rolls the web passes through the edge guides 21, which guide and align the web preparatory to the edge slitting operation which is performed by the circular slitting knives 23 on the vertical rotating shafts 25.

In order to present the web properly to the edge slitting knives, stationary guides are provided in the form of a lower support 26 and a top plate 27 between which the web passes. The inner adjacent faces 28 of these guides are beveled at their outer edges as shown in Fig. 3, to accommodate the beveled edges 29 of the slitting knives, and permit the latter to spread open the slit to provide a groove or seat for the cord.

The cords 30 are fed from supply cops or rolls 31 past the adhesive applying rolls 33, where they are coated with glue or other suitable adhesive supplied from the tanks 35 and transfer rolls 37. The cord-applying rolls 38 have grooved peripheries 39 to receive the cords from the rolls 33, and guide and press the cords into the clefts or slits 41 in the edges of the web 15, the latter at such time passing between the top guide 43 and bottom support 45.

The web 15 with glue-coated cord 30 embedded in the slits on each edge thereof next passes to the rolls 47 where the cover paper 49 from the roll 51 is applied to the bottom face of the cardboard web 15. The cover paper on its way from the supply 51 passes over the supporting roll 55 and its top face is coated by the pasting roll 57 with paste received from the transfer roll 59 and paste reservoir 61. The web 49 of cover paper is wider than the web 15 of pasteboard, so that when the cover paper is applied to the bottom face of the web or pasteboard, there is a projecting margin 63 of cover paper on each side of the pasteboard web, as shown in Figs. 1 and 5.

The combined pasteboard and cover paper webs then pass to the plows 65, shaped to turn over the projecting margins 63 of the cover paper around the edges of the cardboard and reinforcing cord and onto the top marginal surface of the cardboard, as shown in Fig. 6.

From the plows the composite web passes between the pressure and feed rolls 67 which press the parts forcibly together, at the same time advancing the web to the conventional creasing, slitting, and severing mechanisms for producing blanks of conventional form such as shown in Fig. 9.

This blank comprises the main or body portion 69, side wings 71, and end wings 73 with the end wing extensions 75. Longitudinal creases or fold lines 77 are positioned between the side wings 71 and the body 69, and transverse fold lines 79 separate the end wings 73 from the body 69 and extend onto the side wings to separate the side wing extensions or corner tabs 81 from the side wings. Supplementary transverse creases 83 lie between the end wings 73 and extensions 75.

The re-inforcing cord 30 is shown in dotted outline at the outer edges of the side wings 71, with the cover paper 63 wrapped around the edges of the cord, and extending inwardly on the face of the side wings. Slots or notches 85 are provided at the ends of the blank, which separate the corner tabs 81 from the end wings 73 and extensions 75.

The blank shown in Fig. 9 is a box cover blank from which the box cover shown in Fig. 10 will be formed or "set up," with the side wings 71 turned up to form the sides and with the corner tabs 81 turned inwardly to form a portion of the end construction. The end wings 73 are turned up and secured by glue or adhesive to the inturned corner tabs 81, and the end wing extensions 75 are turned inwardly and downwardly and secured by adhesive to the inner faces of the corner tabs and the end wings.

As shown in enlarged detail in Fig. 11, the re-inforcing cord 30 lies along the top edges of the side wings and corner tabs being firmly secured in the cleft or slit by adhesive and the cover paper 63.

When the box is drawn forward by the shoe salesman by his fingers inserted behind the front end of the cover, the strain on the corners of the cover will be taken largely by the reinforcing cord, and tearing or breaking of the cover and box board at such times will be prevented.

For the production of the modified blank shown in Figs. 7 and 8, the rotating slitting knives 23 are omitted or rendered inoperative and the re-inforcing cords, after being treated with adhesive, are laid against the unsplit outer edges of the web of box board at or close to the point where the cover paper is applied to the box board web. The adjacent margins of the cover paper will then be wrapped around the cords in the manner heretofore described, and applied to the top margins of the box board web.

The composite web of box board, re-inforcing cord, and cover paper are then subjected to the usual operations to form the individual flat blank such as shown in Fig. 9, which may subsequently be set up into the box cover illustrated in Fig. 10 in the manner above described in connection with the blank having slitted edges.

The operation of the machine and the manner of use of the blanks having already been fully set forth, such description will not be here repeated.

While the present invention has been shown and described herein in what is now considered to be its preferred form, the invention is not limited thereto, but may be embodied in other forms and arrangements within the scope of the language of the appended claims.

Where in the foregoing description reference is made to a box or boxes, this is to be understood as including box covers.

Having thus described the invention, what is claimed is:

1. A box comprising a bottom, sides having inturned end extensions, and ends adhesively secured to said extensions, all integrally formed from a single layer of cardboard or the like, the top edges of the sides and extensions being provided throughout their length with a downwardly extending cleft, a re-inforcing cord throughout its length partly embedded within and partly exposed outside the cleft and adhesively secured therein, and a thin cover paper extending over the outer surfaces of the sides and extensions around the cord, and onto the inner surfaces of the sides and extensions and adhesively secured directly to such outer and inner surfaces adjacent the cord and also adhesively secured to the exposed part of the cord.

2. A flat box blank comprising a body portion, side wings and ends extending therefrom, and extensions projecting from the ends of the side wings, all integrally formed from a single layer of cardboard or the like with a fold line between each wing and its extensions, the outer longitudinal edges of the side wings and extensions being provided throughout their length with an inwardly extending cleft, a reinforcing cord throughout its length partly embedded within and partly exposed outside each cleft and adhesively secured therein, and a thin cover paper extending over the outer surfaces of the sides and extensions around the cord, and onto the inner surfaces of the sides and extensions and adhesively secured directly to such outer and inner

surfaces adjacent the cord, and also adhesively secured to the exposed part of the cord.

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CARL A. MOELLER.

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