Aug. 26, 1930. H. R. STUBBS ET AL 1,774,299

CONTAINER

Filed June 12, 1926

FIG. 1.

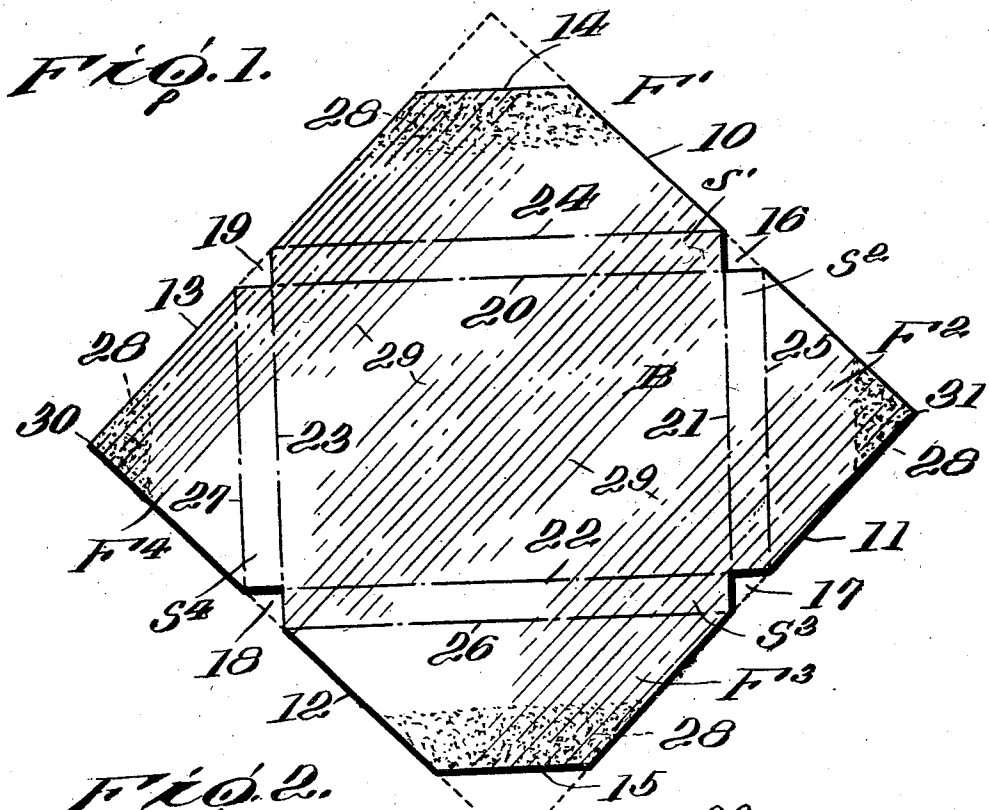
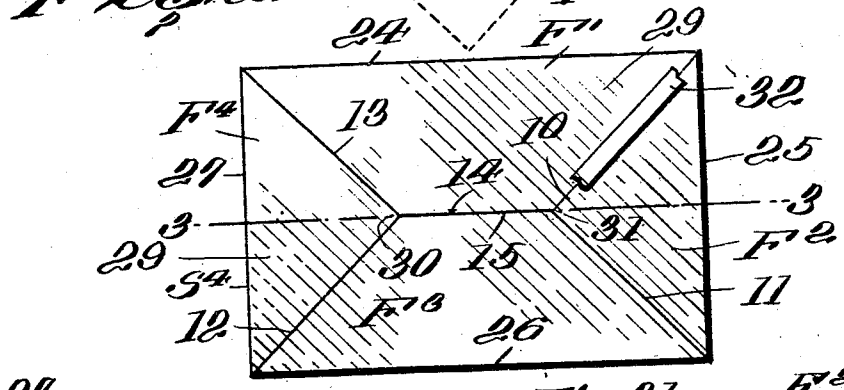


FIG. 2.



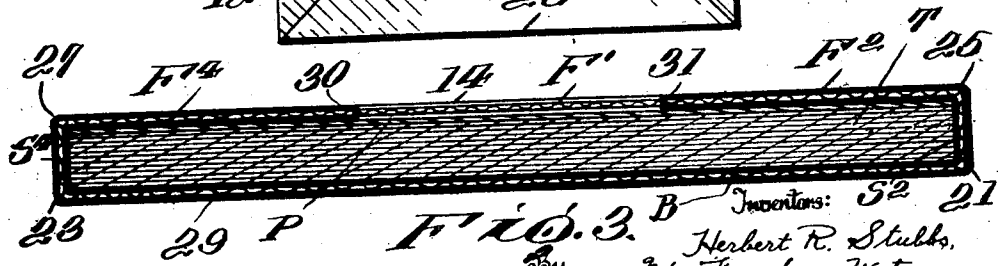


FIG. 3.

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UNITED STATES PATENT OFFICE

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CONTAINER

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This invention relates to improvements in fibre containers which are particularly adapted as shipping receptacles for metal sheets.

It has previously been customary to make containers from fibre or corrugated board by cutting out a blank for the receptacle which is then folded along scored lines parallel to the edges of the blank. In this way, large portions of the material must be cut away to permit folding; and the folded portions are usually overlapped and cemented together. It is found in practice that even with the greatest of care, a certain amount of cement will flow onto the top sheet of the material in the container, during assembly, and that this top sheet must be discarded, particularly with tin plate intended for the manufacture of cans to contain foodstuffs. Likewise, under such conditions, it is necessary to employ a large sheet of fibre material, and to cut away and discard a large portion, in order to afford the proper overlap: or else to leave gaps between opposite flaps, whereby the superimposed containers tended to crush in the walls at these gaps, so that the pile of containers was uneven, and could not be readily handled. In this old arrangement, it was therefore customary to insert a pad of fibre to fill up this gap, with resultant expense.

The present invention proposes a departure from such known methods, in that the blank is cut so that the foldings occur at substantial angles to all edges of the blank, and the edges of the folded sections are brought into such relation to each other to form one side of the receptacle, that a single thickness of the material exists, and for fastening the folded sections together to close and secure the container means are provided which preferably likewise serve to prevent the cement from soiling the top sheet of material.

A further advantage exists in the present box in that the corners of the blank are not exposed near the edge of the box as heretofore, but are located near the center of the top. During the preliminary handling of the blanks, and in folding them down into the final position, they are also not so liable to crumple, since by virtue of the peculiar method of cutting, the corrugations of the material in the illustrated example run parallel to the edges of the folded portions instead of parallel to the edge of the sheet metal to be contained, in which latter event two of the corners have the corrugations at right angles to the lines of stress, and therefore tend to bend easily. The scoring lines may all be at forty-five degrees to the corrugations in case of the use of corrugated board, or to the grain in the case of use of solid fibre board: and may be located exactly at the desired point, and not merely at the trough of the corrugated board nearest to such location. The scored lines, when folding is completed, are equally strong, inch for inch.

Another advantage of the present box is that by reason of the location of the cut-away sections and the scorings, and the omission of all overlaps, a much smaller blank may be employed than heretofore in making a receptacle for sheet materials, of a given standard size. A peculiar feature of the invention is that a square blank may be employed for the preparation of a receptacle for sheet materials which are not square.

Various fibre sheet materials may be employed in making the receptacle such as corrugated board and solid fibre sheeting, of which the former is usually preferred because of its lightness and economy. As set forth above, the present invention provides a method of employing corrugated board whereby its full strength is employed, and the assembled container has no weaknesses owing to bends and folds along lines scored parallel to the lines of corrugation.

The accompanying drawing illustrates one manner of applying the invention, in which the blank is made of corrugated board, and the material to be packed is tin plate of the dimensions of twenty by twenty-eight inches; and as usual about 112 sheets are to be packed in each receptacle, or a height of pile of one and one-half inches.

Figure 1 is a plan of a blank, showing the scored lines and cut-away portions.

Fig. 2 is a similar view of the assembled container.

Fig. 3 is a section, on an enlarged scale, corresponding to line 3—3 of Fig. 2.

The original blank of corrugated board in this instance is a square having the four edges 10, 11, 12, 13 of thirty-seven and a quarter inches length for the particular example.

In preparing the blank for folding, two diagonally opposite corners are clipped at an angle of 45 degrees on the lines 14, 15, which in the specific example are about four inches between the intersections with the lines 10, 12, and 11—13. Four notches 16, 17, 18, 19 are cut in the edges 10, 11, 12, 13 in such positions that when their sides are extended by the lines of scoring 20, 21, 22, 23, these latter lines form a rectangle which is substantially the size of the sheet material to be contained; i. e., twenty by twenty-eight inches, and will form the bottom B of the container. Other scoring lines 24, 25, 26, 27 are then produced upon the blank, which run parallel to the former scoring lines, and separated therefrom by substantially the depth, i. e., one and one-half inches, which it is desired to give the completed container, which delimit the sides S^1, S^2, S^3, S^4 for the container; and the triangular and truncated triangular flaps F^1, F^2, F^3, F^4 which will form the top of the container. The blank is now completed.

In assembling the blank about the pile of sheet metal T to form the container, it is customary with such a blank to place it flat on a suitable surface, and deposit the pile of material accurately in position upon it, within the rectangle B formed by the scoring lines 20, 21, 22, 23. The four sides S^1, S^2, S^3, S^4 are then bent upwardly and the flaps F^1, F^2, F^3, F^4 inwardly about the pairs of scoring lines 20—24, 21—25, 22—26, 23—27, until the two sections of each of the edges 10, 11, 12, 13 of the original blank, as defined by the notches 16, 17, 18, 19 cut therein, are brought into abutting relation with each other. The cut edges of the notches 16, 17, 18, 19 then preferably come into contact, so that the container is closed on all sides, but not sealed.

The lines 14, 15 and the corners 30, 31 are thus brought to the center of the top, and are protected and substantially concealed in a pile of such containers. Each container has a thickness equal to the pile of tin plate, two layers of fibre, and the stock sheet.

The preferred method of retaining the folded blank in this position is to place a sheet of heavy paper P of substantially non-permeable stock, over the last sheet of tin plate in the particular instance, and to brush a proper cement such as sodium silicate, over the four corners of the cut blank, as shown by the dotted areas 28 in Fig. 1. When the blank is then folded over, these coated areas are brought into contact with the non-permeable stock sheet and adhere thereto.

The blank for the next container is then placed upon the assembled container, and its supply of sheet material put in position. The superimposed weight thus brought upon the filled lower container serves to hold the subjacent container with its folded portions in strict contact with the stock sheet until drying or setting of the cement has occurred.

It will be noted that the portions of the line 10 constituting one edge of the blank, as defined by the notch 16, are equal; that is, the length from line 14 to the notch 16 is the same as from the corner 31 to this notch: so that when the container is assembled as in Fig. 2, these two portions of the line 10 substantially coincide to form the flat butt joint. Further, the line 14 is parallel to lines 20 and 24 and spaced therefrom a distance equal to the normal from the point 31 to the respective lines 21 and 25. The same is true for the twin line 15.

In the particular instance the material for the blank has been illustrated as being corrugated board, with the lines of corrugations running in the direction shown by the dotted lines 29. It will be seen that with this method of cutting and folding the blank, the corners 30, 31 and the cut-offs 14 and 15 in no case have the lines of corrugation running parallel to the scoring lines 20, 21, 22, 23, and hence there is no weakness or flexibility of these members. The corrugations likewise cross the scoring lines at forty-five degrees, and in no instance run parallel to them, whereby a further increase of strength is assured.

The illustrated box has the scoring lines 24, 25, 26, 27 intersecting the blank edges 10, 11, 12, 13 at the mutual intersections with the scoring lines 20, 21, 22, 23, whereby a full abutting joint of the flaps is assured; but it will be understood that this is not essential in practicing the invention, though preferable as providing a closure for the enclosed material at all sides without any gap or overlap whatsoever.

If desired, the abutment lines of the folded flaps on the top of the assembled container may be closed by the application of sealing strips of gummed paper as shown at 32 in Fig. 2, which will make a neater package and one less liable to be caught and torn when the containers are slid one on top of another; but it has been found that the interior stock sheet is sufficient for all demands of strength and smoothness.

As a slight modification, only one gash

need be cut from each edge of the sheet, so that triangular flaps are formed which may be turned about the moving lines at the corners and secured to the adjacent side, to form a corner reinforcement.

The illustrated example shows the production of an oblong container from a square blank, the length of the lines 14, 15 being substantially the difference between the length and width of the container. If a square container be made, the lines 14, 15 disappear, and the triangular flaps meet at the center. Likewise, the original sheet may be oblong instead of square.

Containers made from blanks cut in this manner require much less material than those heretofore used, since a saving of around forty per cent in area and weight is effected.

It is obvious that the invention may be varied from the illustrated form as to material, shape, and dimensions without departing from the scope expressed by the appended claims.

What is claimed as new is:

1. A folded blank container for sheet material formed from a blank of originally square form and presenting a rectangular bottom with four rectangular sides joined thereto, the corners of the blank being formed as cover flaps, the area of all of said flaps being equal to the area of the bottom; a stock sheet impervious to a cement and located upon the sheet material, said blank being folded about the sheet material and stock sheet so that the flaps extend in mutual abutting relation over said stock sheet in a single plane parallel to the bottom and are supported in such position by the sheet material, and a layer of said cement joining each of said flaps to said stock sheet whereby to close the container, said stock sheet preventing the staining of the sheet material by the cement.

2. A folded blank container formed from a blank of corrugated material of originally square form with the corrugations extending parallel to edges of the blank, said blank presenting a rectangular bottom formed therein by folding lines which extend obliquely with respect to the corrugations, four rectangular side walls integral with said bottom and respectively joining the four edges thereof, each of said side walls having a cover flap integrally joined thereto at the edge opposite the junction with said bottom, the area of all said flaps being equal to the area of the bottom, all said cover flaps in the assembled and closed container being located in abutting relationship to each other and in a single plane parallel to the bottom, and means to hold said cover flaps in such abutting relationship, whereby the corrugations of said material extend obliquely across the top, sides and bottom of the container and traverse each edge thereof at a substantial angle.

3. A blank for forming an oblong container comprising a single sheet of fibre material of originally square form with diagonally opposite cut-off corners, said sheet having notches cut in each of its four edges and lines of scoring joining said notches whereby to form a bottom and side walls and cover flaps for the container, the area of all of said flaps being equal to the area of said bottom.

4. A blank for forming a rectangular container comprising a single sheet of corrugated material of originally rectangular shape having its cells extending parallel to two of its edges, said sheet having scoring lines for folding, all of said lines being oblique to the direction of said corrugations and cells, said lines constituting two groups intersecting each other at right angles to form a bottom and side walls for the container and cover flaps integral with said side walls, the area of all of said flaps being equal to the area of the bottom.

5. A blank for forming a container from corrugated board comprising a single sheet of such material of originally square form with diagonally opposite cut-off corners, said sheet having scoring lines for folding, all of said lines being at a substantial angle to the lines of the corrugations, and notches in the edges of the sheet adjacent the intersections of the scoring lines therewith, said scoring lines defining a rectangular bottom and side walls, the remaining portions of the sheet between each scoring line for the top edge of the side wall and the adjacent corner constituting integral cover flaps, the area of all of said flaps being equal to the area of said bottom.

6. A blank for forming an oblong container from fibre material comprising a single sheet of such material of originally square form, scoring lines on said sheet extending at forty-five degrees to the edges of the sheet and defining the oblong bottom of the container, the triangular portions formed by said first scoring lines and the edges of the sheet being cut away to form notches, secondary scoring lines on said sheet parallel to the respective first lines and spaced therefrom a distance substantially equal to the proposed depth of the container, the corners of the sheet constituting flaps adapted to be folded over into a single plane to form the top of the container, the corners adjacent the longer sides of the container being cut by a line parallel to the scoring lines for such sides and spaced the same distance therefrom as the corners adjacent the shorter sides of the proposed container, are from their respective scoring lines so that the folded container blank has

only one thickness of material at each of its six sides.

7. A wrapper blank adapted to hold in place and entirely enclose a pile of oblong rectangular sheet material whereby to form a package with the same, comprising a single sheet of stiff corrugated material of originally square form, said sheet having corrugations extending parallel to two of its sides and having scoring lines thereon in rows at mutual right angles and at 45° to the lines of the corrugations, certain of said lines defining the bottom of the substantial size of the sheet material to be enclosed, said certain lines intersecting within the area of the sheet at distances from the edges thereof which, measured along their respective lengths, are equal to the depth of the pile to be enclosed, said certain lines forming triangles with the edges of the sheet and at least one of said lines at each triangle being cut through from the edge of the sheet to the adjacent intersection, others of said scoring lines being respectively parallel to said certain lines and spaced therefrom the depth of the pile to be enclosed, whereby the sides of the package may be formed in wrapping by folding about said certain lines, and the top of the package may be formed by folding the corners of the blank as flaps about said other lines, diagonally opposite corners being cut away so that the area of all said flaps is equal to the area of the bottom, and said flaps upon assembly may lie in a single plane, and holding means secured to each said flap and cooperating with the pile of material enclosed therein to maintain said flaps in a single plane parallel to said bottom.

8. A blank for forming a container comprising a single sheet of fibre material of originally rectangular form, said sheet having obliquely extending pairs of parallel lines thereon spaced apart a distance substantially equal to the depth of the container to be produced and mutually intersecting at right angles, said sheet also having at each edge at least one gash extending to the adjacent intersection of the innermost lines of said pairs, whereby said blank presents a rectangular bottom separated by scoring lines from four substantially rectangular sides, each of said sides being separated by a scoring line from a respective flap formed from a corner of the sheet, the area of all of said flaps being equal to the area of the bottom.

9. A rectangular container formed from a blank of corrugated material of originally square form and having the corrugations extending parallel to edges of the blank, said blank having scoring lines at angles of 45° with respect to the edges and corrugations to provide a rectangular bottom and four rectangular side walls at right angles to the bottom and joined integrally to said bottom, each said side wall being located in the blank between said bottom and a corner of the original sheet, and four corner flaps located each between a side wall and the corner adjacent thereto and joined integrally at one of said scoring lines to the adjacent side wall, said container having its bottom and its cover flaps when closed located in parallel planes and its side walls in planes at right angles to said parallel planes so that the corrugations of said material traverse every top and bottom edge of the container at a substantial angle whereby all said edges are equally strong.

10. A container formed from a single integral square piece of corrugated board having the corrugations extending parallel to side edges thereof and having fold lines at angles of 45° with respect to the edges and corrugations and so disposed as to provide a one-piece rectangular bottom, rectangular sides at right angles to the bottom, and flaps adapted to form a closure for the container, said sides being each joined to the bottom at the lower fold line and to a flap at the upper fold line, the side edges of said flaps being disposed along lines intersecting each other at right angles, and the lines of corrugations being disposed so as to extend at an oblique angle across each of said fold lines and intersecting one of the side edges of each flap at a right angle and paralleling the other side edges of each of said flaps, said corrugations in the flaps when in closed position extending in substantially parallel lines diagonally across the entire closed end.

In testimony whereof, we affix our signatures.

HERBERT R. STUBBS.
FRANK WATSON.