Jan. 16, 1940. J. A. FARMER 2,187,305

METHOD OF SEALING FOLDED BLANK BOXES

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Fig. 1.

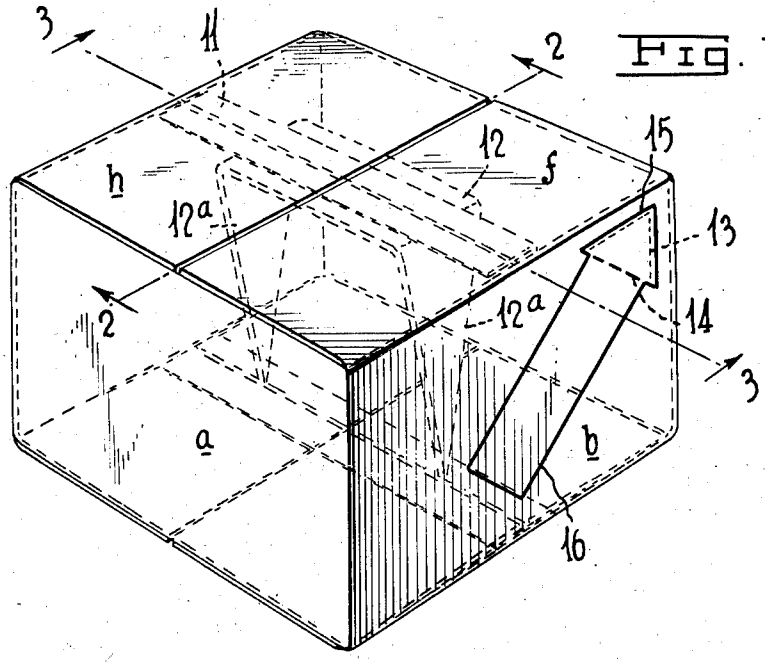


Fig. 2.

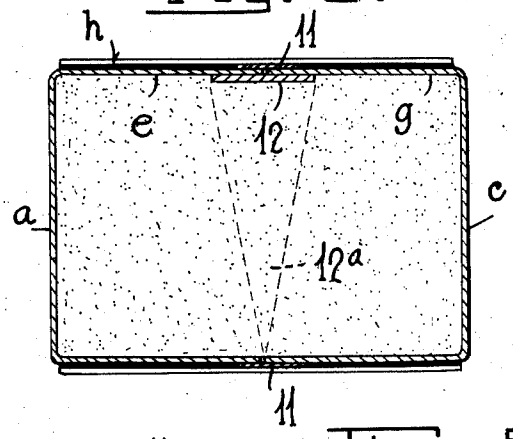


Fig. 3.

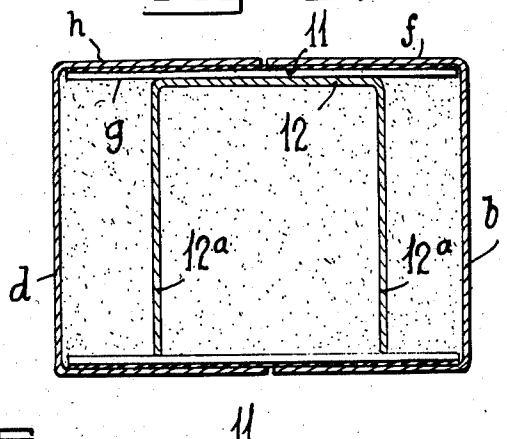
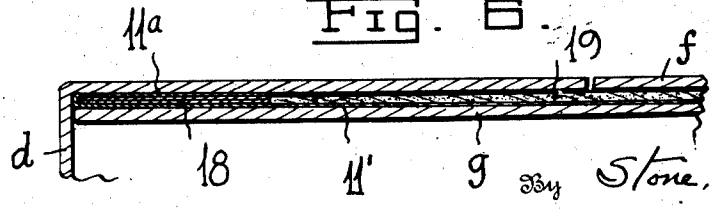


Fig. 6.



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Fig. 4.

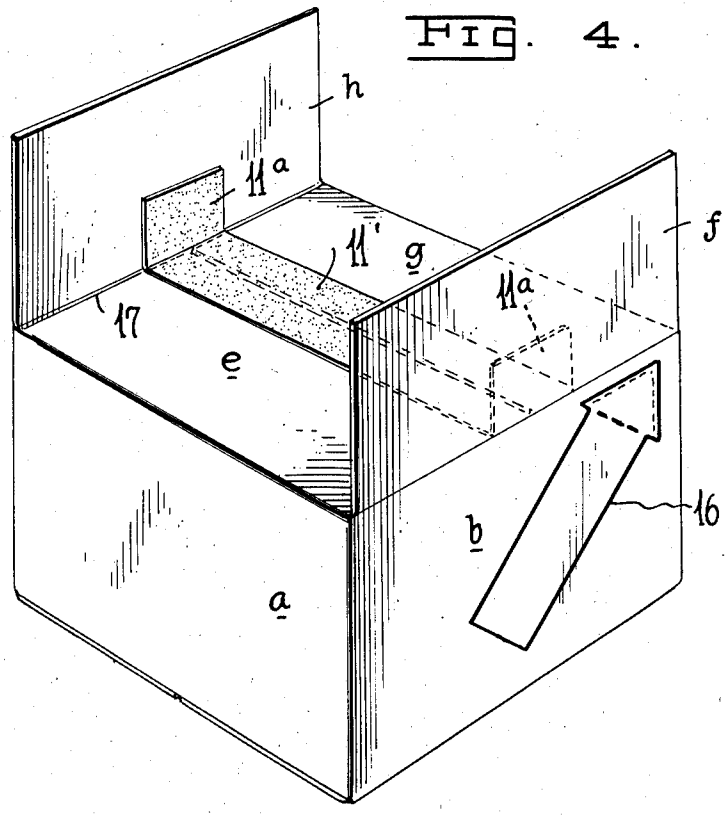
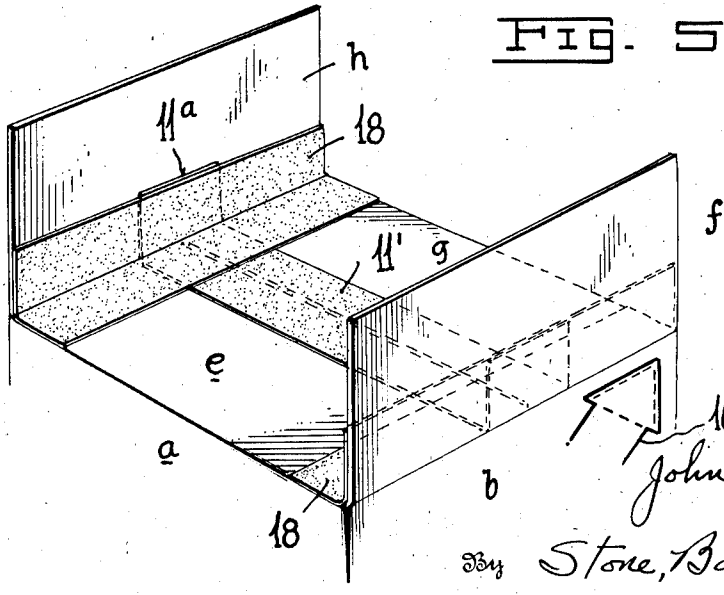


Fig. 5.



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METHOD OF SEALING FOLDED BLANK BOXES

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Application June 7, 1938, Serial No. 212,357

9 Claims. (Cl. 229—45)

This invention relates to folded blank boxes, and more particularly to boxes made of relatively heavy fibrous material such as corrugated board or fiber board, and commonly known as shipping cases.

The present application is a continuation in part of my prior copending application Serial No. 170,693, filed October 23, 1937.

Boxes or containers of the above character are usually formed from a single blank of sheet material provided with the necessary cuts and creases or weakened fold lines dividing the blank into four side panels and a pair of inner and a pair of outer flaps at each end.

My prior above mentioned application is directed to improved means for forming the corners of such boxes so as to completely close them and prevent the sifting out of fine material. The present application is directed to means for sealing the longitudinal cracks or spaces between the pairs of end flaps, and for facilitating the cementing of the outer flaps securely upon the inner flaps.

An object of the present invention is to provide means for supporting the inner flaps so that they may be coated with cement and the outer flaps folded over and pressed down thereon so as to adhere thereto, without danger of the inner flaps sagging inwardly.

Another object is to provide means for securely sealing the crack between the flaps and also the crack between each flap and the adjacent side wall of the box, so as to prevent any possibility of the escape of finely divided material.

In order that the invention may be readily understood, reference is had to the accompanying drawings forming part of this specification, and in which:

Fig. 1 is a perspective view of a completed box or container showing in dotted lines one form of construction for carrying out the above objects;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1, looking in the direction of the arrows;

Fig. 3 is a transverse section on the line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a perspective view of a slightly different construction, the box being shown with the outer flaps in the position which they occupy before being folded down;

Fig. 5 is a similar fragmentary view showing the use of an additional sealing strip; and

Fig. 6 is a fragmentary transverse section on an enlarged scale, through the top of the box shown in Fig. 5, after the outer flaps have been folded down and cemented.

Referring to the drawings in detail, the four side panels of the box are designated *a*, *b*, *c* and *d*, while the pair of inner flaps at the upper end of the box are designated *e* and *g*, and the overlying pair of outer flaps are designated *h* and *f*.

It has long been the common practice, in closing boxes or shipping cases of the type in question, to first fold in the inner flaps, then cover them with a coating of adhesive such as silicate of soda, and then press the outer flaps down upon this adhesive, so as to securely hold the flaps together. With this method, it is apparent that a small hole or opening would be left at the intersection of the cracks between the two pairs of flaps.

In order to seal this opening, and referring first to Figs. 1 to 3, I employ a sealing strip of tough, flexible material, such as kraft paper. After bringing the inner flaps, such as *e* and *g*, down into position, I apply such a sealing strip 11 by means of adhesive along the crack between the meeting edges of these flaps. I then coat the outer surface of the inner flaps and sealing strip with adhesive, as indicated by the heavy line in Fig. 2, and press the outer flaps down upon the adhesive coated surface. In this way, the sealing strip is interposed between the pairs of inner and outer flaps. This is done, of course, at both the top and bottom of the box, as shown in the drawings.

When packing shipping cases of this character with loose granular or fluent material, it is difficult to support the inner top flaps with sufficient firmness to properly apply the sealing strip and press the outer flaps firmly against them. The material with which the case is filled and on which the inner flaps rest when folded down, is apt to yield, and permit the inner flaps to sink below the plane of the top of the box, thus rendering proper sealing impossible.

To remedy this difficulty, I provide a bridge piece or support 12, as shown in Figs. 1 to 3. This may conveniently be formed of the same material as the box blank and is preferably U-shaped, comprising a horizontal portion and a pair of substantially parallel legs 12a. These legs may be of such a length as to extend to and rest upon the bottom of the box, or, in some cases, shorter legs will suffice.

In using this device, I proceed as follows. The box is filled with fluent material and the bridge piece 12 is then inserted by pressing the same down into the material, the legs 12a becoming embedded in the material and in some cases extending to the bottom of the box. In any event,

the bridge piece is pressed down until its upper surface, which is positioned adjacent the center of the box, is substantially flush with the top edges of the box. As shown, the bridge piece 12 extends longitudinally of the meeting edges of the inner flaps.

After the bridge piece 12 has been placed in position, it is coated with adhesive and the inner flaps then folded in and pressed down upon it. Then the sealing strip is applied, the whole coated with adhesive and the outer flaps pressed down, as above described, the bridge piece sustaining the inner flaps and holding them in substantially horizontal position while the outer flaps are pressed down in close contact with them. After the adhesive has set, the bridge piece is firmly united to the inner flaps and forms a further reinforcement.

Owing to the complete and effective manner in which my improved shipping case is sealed, it is desirable to provide some special means for opening the same and for dispensing the contents. This can conveniently be done by forming one of the side panels with a section adapted to be cut and folded back so as to provide a pouring opening. I have indicated this in Fig. 1, in which triangular marks 13 and 14 are shown adjacent one upper corner of the side panel *b*, the marks 13 defining a line along which the section may be cut, and the mark 14 indicating a weakened line about which the triangular section may be folded back so as to provide an opening. Preferably the sides of the triangular opening thus formed are substantially parallel with the side and top edges of the box and are as close as practicable to the corner.

In order to call the purchaser's attention to this dispensing opening and to aid him in properly manipulating the same, I preferably enclose the above mentioned triangular section within an outline 15 representing the head of an arrow, the shaft 16 of the arrow extending diagonally across the panel and having printed thereon instructions or directions for opening the box. This dispensing feature is not claimed herein but is reserved to form the subject matter of a separate application.

Referring now to Figs. 4, 5 and 6, I have shown a slightly different construction. The sealing strip, corresponding to the strip 11 in the other figures, is illustrated at 11' in Fig. 4, but this strip is made longer so that the end portions 11a thereof are turned up as shown and may be pressed into contact with and secured to the inner faces of the upstanding outer flaps *f* and *h*. By carefully applying this strip 11', with its ends 11a, as shown and described, the inner flaps *e* and *g* are supported and firmly anchored to the upstanding outer flaps, and are thus prevented from sagging inwardly.

In such boxes as usually constructed, there exists a small crack or opening 17 between the sides of the inner flaps *e* and *g* and the adjacent side panels. In order to effectively close this crack or opening, I employ a second sealing strip 18, as clearly shown in Fig. 5, this strip extending longitudinally of the crack 17 and being secured partly to the inner face of the outer flap *h* and partly to the upper face of the inner flaps *e* and *g*, extending transversely across the same. The strip 18 overlies the strip 11' and its turned up end 11a, as shown in Fig. 5.

After having placed the strips 11' and 18 on the box, as illustrated in Fig. 5, the entire upper surface of the inner flaps, and of the strips 11' and 18 is coated with a suitable adhesive such as sodium silicate and the outer flaps then pressed down thereon, as illustrated in Fig. 6. The inner flaps *e* and *g*, being supported by the strip 11', are prevented from sagging inwardly and the outer flaps *f* and *h* can thus be pressed into firm contact therewith. Fig. 6 shows the final position of the parts, with the strip 18 folded over upon itself. In this figure, the cement is indicated at 19.

It will be understood that the improved form of strip 11' constitutes a means for supporting the inner flaps and may be used either in conjunction with or without the bridge 12 illustrated in Figs. 1 to 3. Similarly, of course, the sealing strips 18 may be and preferably are employed whether or not the bridge 12 is used. Thus the construction shown in Figs. 4, 5 and 6 constitutes what may be regarded as additions to the features shown in Figs. 1 to 3 and may be used either with or without such features.

Although in the drawings I have, for the sake of simplicity, shown only a conventional box, and have not attempted to illustrate my improved corner construction, it will, of course, be understood that the box shown in these figures is intended to embody one of the improved corner constructions described in my above identified prior application.

What I claim is:

1. In a folded blank box having an end closed by pairs of overlapping inner and outer flaps, each pair having parallel meeting edges, the outer flaps being folded over upon and cemented to the inner flaps, means extending longitudinally of the meeting edges of said inner flaps for supporting the same so that they will be substantially prevented from sagging inwardly.

2. In a folded blank box having an end closed by pairs of overlapping inner and outer flaps, the latter being folded over upon and cemented to the former, means for supporting said inner flaps so that they will be substantially prevented from sagging inwardly, said means comprising a sealing strip applied over and secured to the outside of the meeting edges of the pair of inner flaps and having its ends anchored to the inner faces of the adjacent respective outer flaps.

3. In a folded blank box having an end closed by pairs of overlapping inner and outer flaps, the latter being folded over upon and cemented to the former, means for supporting said inner flaps so that they will be substantially prevented from sagging inwardly, said means comprising an inverted U-shaped bridge piece positioned beneath and secured to the inner surface of said inner flaps.

4. In sealing the ends of folded blank boxes formed by pairs of overlapping inner and outer flaps, the free adjacent edges of the flaps of each pair lying in the same plane, and the outer flaps being folded down upon and cemented to the inner flaps, the step which comprises providing means extending along the adjacent edges of the inner flaps for supporting the same so that they will be substantially prevented from sagging when the outer flaps are pressed down into contact therewith.

5. The method of sealing the ends of folded blank boxes formed by pairs of overlapping inner and outer flaps, which comprises applying a sealing strip longitudinally over the meeting edges of the outside of the pair of inner flaps, coating the surface of said flaps, including said strip, with adhesive, and then folding over and pressing

the outer flaps into close contact with such adhesive coated surface, whereby said sealing strip is confined between and secured to both the inner and outer flaps.

6. The method of sealing the ends of folded blank boxes formed by pairs of overlapping inner and outer flaps, which comprises applying a sealing strip over the meeting edges of the outside of the pair of inner flaps, and attaching the ends of said strip to the inner faces of the adjacent outer flaps, coating the surface of said inner flaps, including said strip, with adhesive, and then folding over and pressing the outer flaps into close contact with such adhesive coated surface, whereby said sealing strip is confined between and secured to both the inner and outer flaps.

7. The method of sealing the ends of folded blank boxes formed by pairs of overlapping inner and outer flaps, which comprises applying a sealing strip over the meeting edges of the outside of the pair of inner flaps, applying a second sealing strip over the first along the crack between each side edge of the inner flaps and the adjacent sides of the box, coating the surface of said inner flaps, including both strips, with adhesive, and then floding over and pressing the outer flaps into close contact with such adhesive coated surface.

8. The method of sealing the ends of folded blank boxes formed by pairs of overlapping inner and outer flaps, which comprises applying a sealing strip longitudinally along the crack between each side edge of the inner flaps and the adjacent sides of the box, said strip engaging both the inner flaps and the adjacent outer flap, coating the surface of said inner flaps, including the portions of said strips in engagement therewith, with adhesive, and then folding over the outer flaps, together with said strips, and pressing them into close contact with such adhesive coated surface.

9. The method of sealing the upper end of a box having overlapping pairs of inner and outer flaps and filled with fluent material which comprises inserting in such material the legs of an inverted U-shaped bridge piece in such position as to support the edges of the inner flaps, securing the inner surface of such flaps to the upper surface of said bridge piece by means of adhesive, coating the outer surface of said inner flaps with adhesive, and pressing the outer flaps down upon the same.

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