

March 28, 1944.

K. K. NEWSOM

2,345,000

BOX AND CLOSURE CONSTRUCTION

Filed Sept. 22, 1941

2 Sheets-Sheet 1

FIG. 1

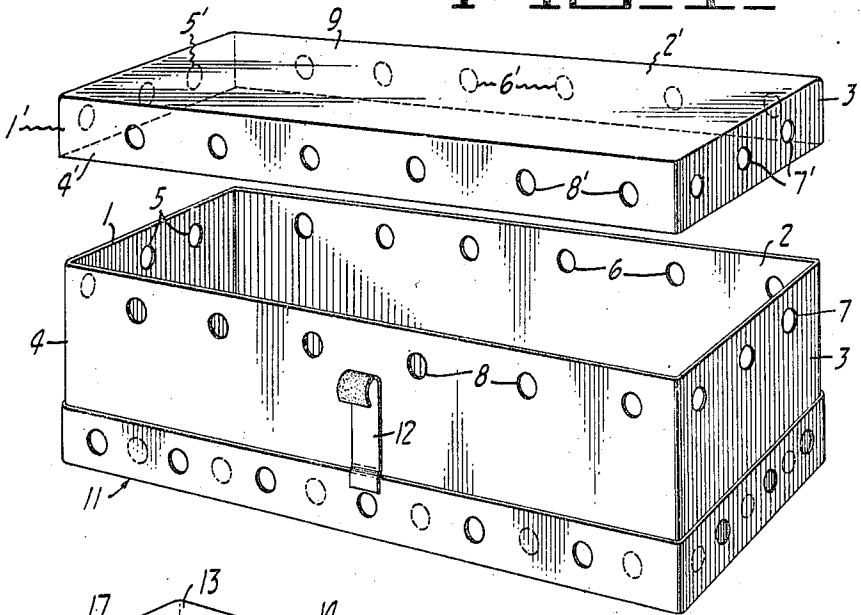


FIG. 2

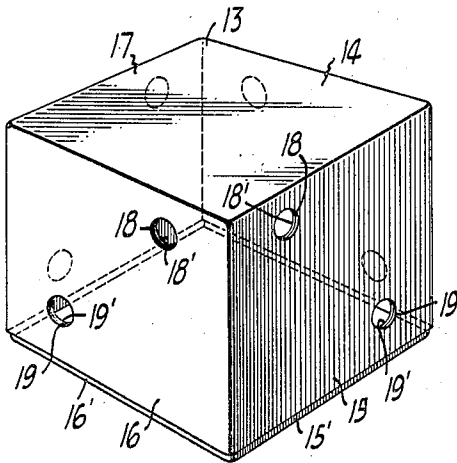


FIG. 3

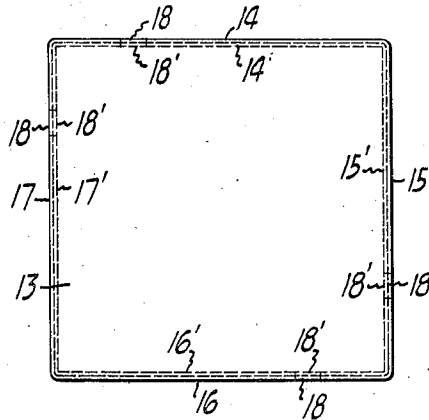
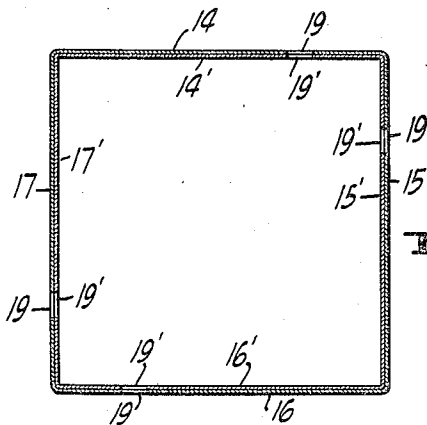


FIG. 4



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FIG. 5-

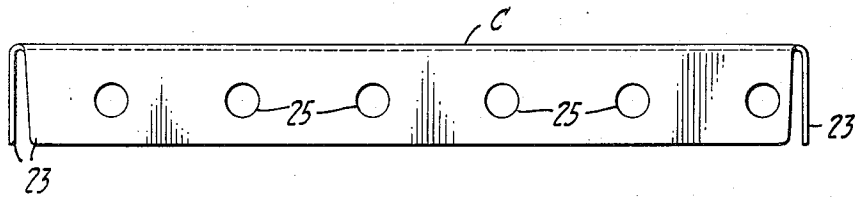


FIG. 6-

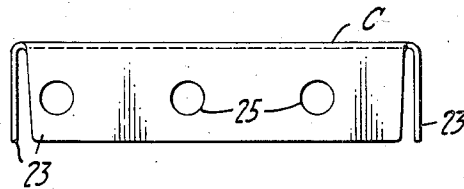
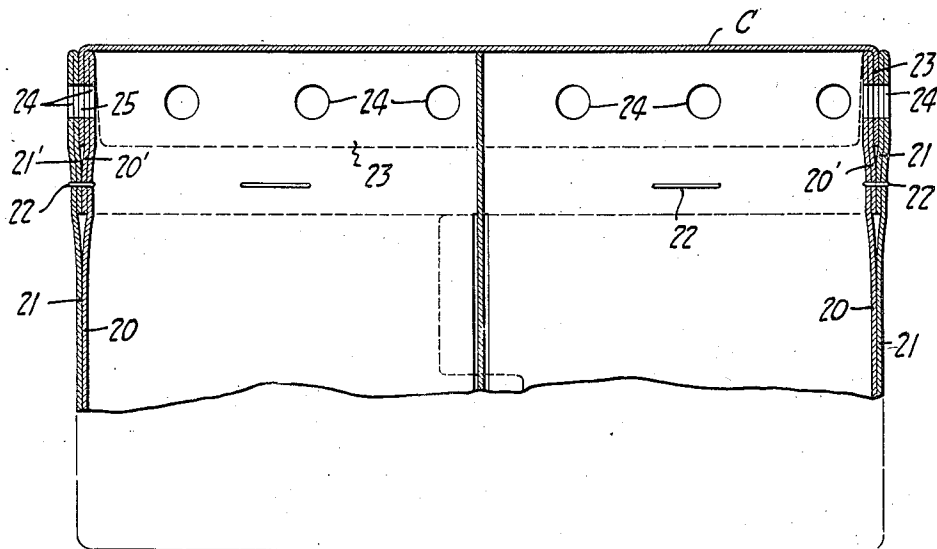


FIG. 7-



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BOX AND CLOSURE CONSTRUCTION

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Application September 22, 1941, Serial No. 411,771

1 Claim. (Cl. 229—6)

This invention relates to a box and closure with ventilation openings therein.

One of the objects of this invention is a strong, economically made box and closure therefor, so constructed as to provide for ventilation or sealing of the box, as desired, by merely placing the closure on the box in one or the other of two positions, and which closure when so positioned is automatically secured on the box against being shifted or moved in its plane out of either of said positions.

Another object of the invention is an oblong box having at least one of its six sides open, and a closure removably supported on the free edges of the four sides defining said open side, and which closure and said four sides are so constructed as to provide means for ventilation of the box or for sealing the box against such ventilation according to the position of the closure on the box; the said closure being formed to fit on the box and over said open sides in any one of several positions.

An additional object is the provision of a box having four lateral sides, a bottom, and a removable closure for the side of the box opposite said bottom, and which lateral sides have ventilation openings therein which may be closed or left open, as desired, by merely turning the cover in the plane thereof to one of several predetermined positions when the closure is free from the box, and by then placing the closure on the box in the desired position according to whether the box is to be ventilated or sealed.

A still further object is a box having removable top and bottom closures arranged and adapted to cooperate with openings in the marginal portions of the side walls adjacent said closures for either sealing or uncovering said openings, as desired, to provide for a completely sealed box, or one with ventilation openings adjacent either the bottom or top closure or both.

Other objects and advantages will appear in the specification and drawings.

The disclosure herein includes matter divided out of my co-pending application, Serial No. 186,996, filed January 26, 1938, and in this respect is a division of said application; Figures 5, 6 herein corresponding to Figures 9, 10 in said application, and Figure 7 corresponding to Figure 8 in said application insofar as the invention herein is concerned.

In the drawings, Figure 1 is a perspective view showing a box with upper and lower closures, and which upper closure is free from the box pre-

paratory to positioning the same on the box in a manner to provide for ventilation, while the lower closure corresponds in every respect to the upper closure, but is in position on the box sealing the lower end of said box, and which lower margins of the lateral sides of the box and said lower closure are adapted to provide for ventilation the same as the upper closure by merely reversing the lower closure, end for end.

Figure 2 is a perspective view of a form of the invention that slightly differs from that of Figure 1 in that the box and upper closure are formed to provide for ventilation of the box adjacent both the top and bottom of the box, or which box may be sealed by making merely a quarter turn of the closure about its vertical axis from the position shown in Figure 2, before placing the closure on the box.

Figure 3 is a top plan view of the box of Figure 2, and Figure 4 is a horizontal sectional view of the box of Figure 2 taken below the upper openings in the box and closure therefor.

Figure 5 is a side elevational view of a closure for the box of Figure 7.

Figure 6 is an end elevational view of the closure of Figure 5.

Figure 7 is a fragmentary sectional view taken through a box with the closure of Figures 5, 6 in position thereon, and which box and closure are of slightly different construction from that of Figure 1, or Figure 2.

Boxes and closures made in accordance with this invention are preferably of fiber board, or cardboard, and the boxes of Figures 1, 2 may be formed in any of the conventional ways, and may be "knock-down" or "set-up" boxes.

The four lateral sides, 1 to 4, inclusive, in Figure 1 are each formed with a plurality of openings arranged in a horizontal row in the upper and lower marginal portions thereof adjacent the upper and lower sides of the box. Side walls 1, 3 are opposed to each other, and walls 2, 4 which are at right angles to walls 1, 3 are also in opposed relation.

The upper openings in side walls 1, 3, respectively, are designated 5, 7 while the upper openings in walls 2, 3, respectively, are designated 6, 8.

The aforesaid openings in each side wall are preferably circular, and of equal diameters, and are also preferably equally spaced apart.

Where each of the four lateral sides is provided with a row of openings, as in Figure 1, it will be seen that one of the end openings in each

row is spaced a substantially greater distance from the corner of the box adjacent thereto than is the opposite end opening in each row with respect to the corner adjacent said latter opening. The greater of the above distances is necessarily greater than the diameter of any one of the openings in each row in order to accomplish the sealing result. Also it is to be noted that the openings in the opposed sides are correspondingly positioned so that each opening is exactly opposite a corresponding opening in the opposite side. The spacing between adjacent openings in each row is greater than the diameter of any opening of such row.

The top closure comprises a flat sheet 9 having opposed conventional flaps or flanges 1', 3' along two of its opposite edges and flanges 2', 4' along its other two edges. The sheet 9 fully extends over the upper open side of the box, and the flanges 1' to 4' are arranged to telescopically and slidably receive the upper marginal portions of the lateral sides 1 to 4 with the free edges of the flanges terminating below the rows of openings in said lateral sides. The flanges 1', 3' are adapted to fit against the walls 1, 3 while flanges 2', 4' fit against walls 2, 4.

Flanges 1', 3', have a row of openings 5', 7', respectively, in each corresponding to openings 5, 7 in walls 1, 3 while flanges 2', 4' each have openings 6', 8' therein corresponding to openings 6, 8, respectively. These openings in said flanges are spaced from the sheet 9 so as to register with the openings in the upper marginal portions of the sides of the box when the sheet is supported on the free upper edges of sides 1 to 4. Thus when the closure sheet 9 is positioned on the box, with the closure flanges in the position indicated in Figure 1, the openings in the flanges will register with the openings in the side walls providing for ventilation of the box at its upper end.

Upon an end for end reversal of the top closure, the box will be sealed at its upper end, and this sealed position will resemble the position of the bottom closure as shown in Figure 1, assuming the box to be inverted and the bottom closure 11 to be on top.

This bottom closure is identical in structure to the top closure, and the lower marginal portions of the side walls are each formed with a row of openings identical with those in the upper marginal portions.

This structure being already explained with respect to the top closure and upper openings, the description is clear and definite; hence no need exists for any further description of the said lower closure and the lower marginal portions of the side walls and the openings in said portions and in the lower closure flanges.

To provide a fully ventilated box, top and bottom, all that is necessary is to reverse the lower closure 11, end for end, and to provide a fully sealed box, it is only necessary to reverse the upper closure 9, end for end. To provide a box having the lower portion ventilated and the upper portion sealed, it is only necessary to reverse the upper and lower closures, respectively, end for end from the positions shown in the drawings.

If desired, after the box is formed and assembled, the closures may be secured to the box against renewal, by tape 12, staples, adhesive, clips, or by any other suitable means.

Figures 2 to 4 show a box structure in which there is a rectangular closure portion 13 having rectangular flanges 14 to 17, inclusive, adapted to

telescopically fit over the rectangular sides 14', 15', 16, 17' of the box when the closure portion is in position closing the open upper end of the box. Insofar as the box and closure structure are concerned, they may be made collapsible or permanently set up, as desired, in any of the many conventional ways.

Each of the flanges on the closure is provided with at least one pair of openings, one of which openings 18 is an upper opening positioned adjacent, but spaced from a corner of said closure portion, while the other of each pair of openings in each flange, designated 19, is positioned adjacent the free edge of such flange and adjacent the corner of the flange that is diagonally across from the corner in which the opening 18 is positioned. Each of the sides 14' to 17' of the box is formed with at least one pair of openings, there being an upper opening 18' and a lower opening 19' in each side, and which openings are correspondingly positioned in said sides to openings 18, 19 in the respective flanges.

The upper openings 18 in the flanges and upper openings 18' in the box sides are positioned adjacent two diagonally opposite corners of closure portion 13, while the lower openings 19, 19' are positioned adjacent the two diagonally opposite corners of the bottom of the box that are in a plane at right angles to the two said diagonally opposite corners of the closure portion. The flanges 14 to 17 extend almost to the bottom of the box, and as the openings in the flanges and sides are positioned to correspond when the box sides are telescopically enclosed by the flanges, it will be seen that the opening 18, 18' and 19, 19' will register with each other when side 14' is against flange 14, thus providing a row of ventilating openings along the lower portion of the box and a row of ventilating openings along the upper portion of the box.

In the box illustrated in Figures 2 to 4, the sides thereof are of similar shape and size, while the flanges are likewise of similar shape and size. Hence, in order to fully seal the ventilating openings, and consequently the box, all that is necessary is to remove the closure from the box and to give it a quarter turn about its vertical axis in either direction, and to then replace it on the box. The openings 18, 19 and 18', 19' will then be closed by an imperforate portion of the sides of the box and flanges, respectively.

It is, of course, obvious that where the box is oblong, instead of square, that the provision for full sealing of upper and lower openings by flanges on a single top closure in the general manner shown in Figures 1 to 3 would require an arrangement of openings generally as shown in Figure 1, and a full end for end reversal of the closure, or box would be required.

Figures 5 to 7 correspond to the construction shown in Figures 8 to 10 in my co-pending application, Serial No. 186,996, and in this form of box, each of the side walls is a double layer of cardboard, each side wall comprising an inner layer 20, and an outer layer 21. The inner and outer layers may terminate in free edges along the upper open side of the box, but in the drawings I show extensions 20' on each outer layer folded against the main inner layer to a position between the inner and outer layer, while an extension 21' on each outer layer 21 is folded against the main layer 21 to a position also between the inner and outer layer. Thus the extensions 20', 21' lie against each other, and the lines of bend define the upper free edge of the

side walls of the box. The extensions 20', 21' and layers 20, 21 of each side of the box are stapled together by staples 22, or by any other suitable means, but said staples are disposed substantially below the upper free edges of the side walls a sufficient distance to enable the flaps 23 of cover C to be inserted between the adjacent sides of extensions 20', 21', or to between the inner and outer sides 20, 21, in the event the extensions are omitted.

Each of the side walls is provided along its upper margin, and above the staples 22, with a row of openings 24, which openings extend through the inner and outer layers, including these extensions. Also each of the flaps 23 is formed with a row of openings 25 therein.

The openings in the side walls and in the flaps of the closure, correspond in their arrangement to the openings in the box and closure of Figure 2, being so arranged that the openings in the closure and side walls will cooperate for providing ventilation for the box when the closure is in the position as shown in Figure 4, but upon reversal of the cover, the box will be sealed.

The fact that the closure flaps in this form of box are tightly held between the inner and outer layers of each side of the box, or between the extensions of said layers, as the case may be, insures an extremely tight seal in the event a seal is desired, but in any event, the closure flaps receive the maximum of protection against injury thereto and the box is stronger along the rows of openings than is the case where a single walled box is used. This is important in many cases where rigidity in the box, and its capacity to take abuse is essential.

It is to be understood that the disclosure herein is illustrative and is not intended to be restrictive to the specific form described, since it is clear that the number of ventilating openings

desired may vary, and likewise, the shapes of the openings may be changed, and different box structures may be used.

Having described my invention, I claim:

- 5 A four-sided rectangular box having an open upper side and a closure removably positioned over the latter provided with a pair of opposed flanges depending therefrom and overlapping the upper marginal portions of two of the opposed
- 10 sides of said box, a row of equally spaced registering openings of uniform size formed in each of said flanges and formed in the said marginal portion overlapped thereby providing for free circulation of air across the box through said op-
- 15 posed marginal portions, the adjacent openings of each row being spaced from each other a distance greater than the width of each opening, each of the said openings in one of said marginal portions being diametrically opposite to one of
- 20 the openings in the marginal portion opposed thereto, the diametrically opposite end openings at one of the corresponding ends of the rows in said opposed marginal portions and flanges being spaced from the adjacent one of the remain-
- 25 ing two opposed sides a substantially greater distance than the distance between the other of said remaining two opposed sides and the end openings of the said rows that are adjacent there-
- 30 to, the ratio of said greater distance being other than an even multiple of said distance, whereby a side to side reversal of the closure on said box will position the openings in said flanges over
- 35 imperforate portions of said marginal portions between the openings in said marginal portions with one of the diametrically opposite corresponding end openings in each of the flanges over the imperforate portions of said marginal portions adjacent the said other of said remaining
- 40 sides of the box.

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