

Aug. 14, 1951

R. M. DUNNING

2,564,099

CARTON END CLOSURE STRUCTURE

Original Filed Jan. 4, 1945

2 Sheets-Sheet 1

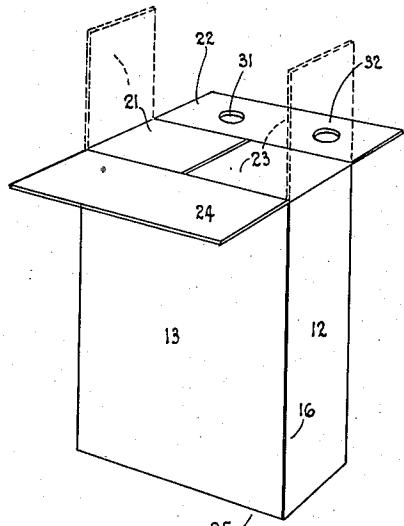


Fig. 1

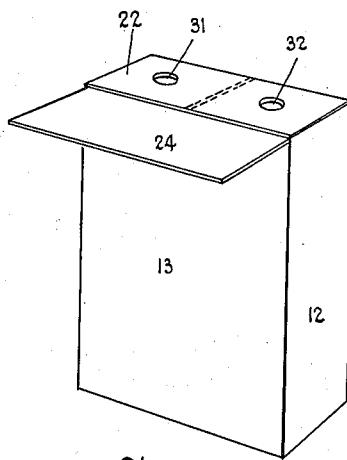


Fig. 2

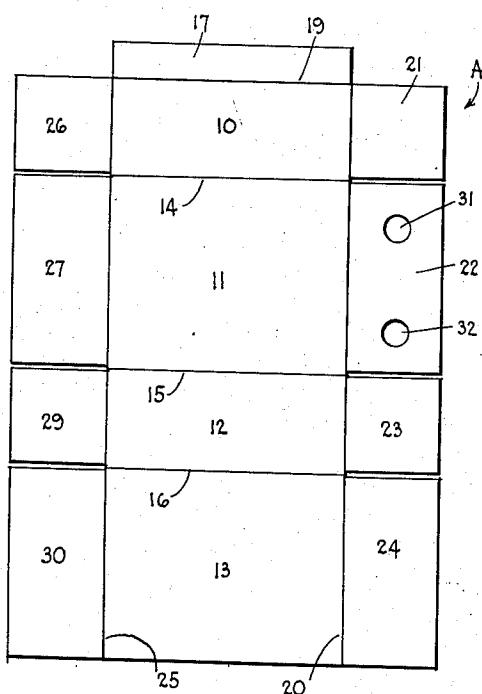


Fig. 4

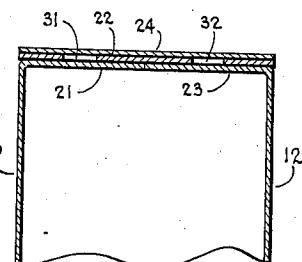


Fig. 3

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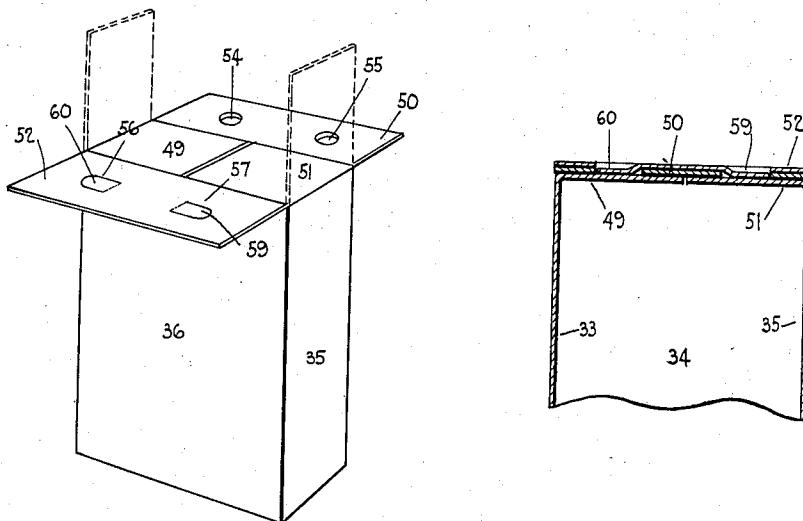
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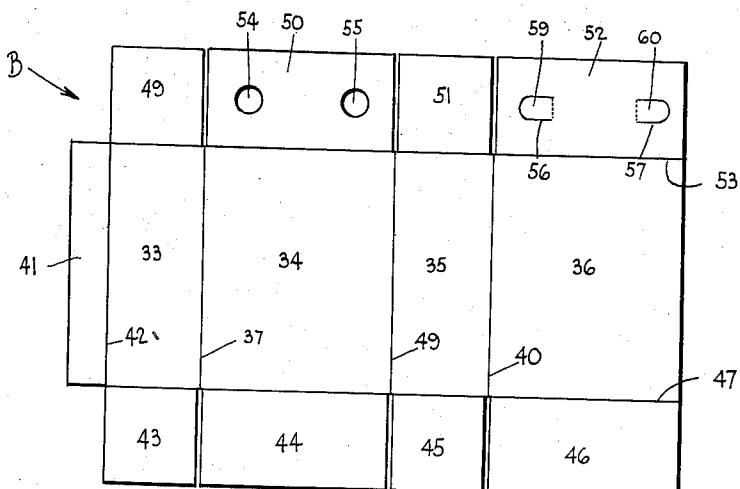
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Fig~5

Fig~6



Fig~7

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CARTON END CLOSURE STRUCTURE

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Original application January 4, 1945, Serial No.
 571,237½. Divided and this application May 3,
 1947, Serial No. 745,789

1 Claim. (Cl. 229—17)

1 My invention relates to an improvement in cartons and deals particularly with a tubular carton having adhesively sealed end flaps.

Much difficulty has been experienced in the sealing of tubular cartons having glue flaps on their ends designed to be adhered in superimposed relation. I have found that by providing apertures in certain of these glue flaps the innermost glue flaps can be drawn against the outer flaps by vacuum. I have also found that a carton having apertures in the intermediate flaps have certain structural advantages over other cartons. This advantage lies in the fact that the adhesive enters the apertures and forms a firm anchor between the flaps.

An object of the present invention lies in the provision of a carton having flaps designed to be folded in superimposed relation and in providing apertures in the flap which forms the intermediate layer of the end wall. An object of my invention also lies in the provision of a sealed carton having end flaps glued in superimposed relation to form end closures and in providing apertures in the intermediate layers of these closures so that the outermost layers can be secured directly to the innermost layers.

A feature of the present invention lies in the provision of a tubular carton which is formed in the usual manner with glue flaps foldably connected to the ends of the side walls. Certain of these flaps are designed to fold into coplaner relation to form an inner end closure lamination. Another flap is foldably connected to another side wall and is designed to fold over the first named flaps to form an intermediate lamination. A fourth side wall end is designed to fold over the intermediate lamination to provide an outer lamination. Apertures are provided in the flap forming the intermediate lamination so that the inner lamination can be directly connected to the outer lamination.

An added feature of the present invention lies in the provision of a carton having tubularly arranged side walls and end closure flaps designed to fold into superimposed relation. Apertures are provided in certain of the flaps outwardly of the outermost laminations so as to provide an effective means of anchoring the innermost lamination thereto.

The present invention is a division of application Serial No. 571,237½ filed January 4, 1945, now Patent No. 2,435,878 for "Method of Sealing Cartons by Suction."

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claim.

2 In the drawings forming a part of my specification:

Figure 1 is a perspective view of a carton in partially sealed condition showing the construction thereof.

Figure 2 is a perspective view of my carton at a later step of the sealing operation showing the arrangement of flaps therein.

Figure 3 is a sectional view through an end of the sealed carton showing the construction thereof after the completion of the sealing operation.

Figure 4 is a diagrammatic view showing the blank from which the carton is formed.

Figure 5 is a perspective view of a modified 15 form of carton construction in partially folded condition.

Figure 6 is a sectional view through the carton of Figure 5 showing the carton in sealed form.

Figure 7 is a view of the blank of which the 20 carton of Figures 5 and 6 is formed.

The carton A illustrated in Figures 1 through 4 of the drawings includes a series of foldably connected wall panels 10, 11, 12 and 13 which are foldably connected along parallel fold lines 14, 25 15, and 16. A glue flap 17 is foldably connected to one end panel 10 along a fold line 19.

The wall panels 10, 11, 12, and 13 are connected at one end along a fold line 20 to end flaps 21, 22, 23, and 24, respectively. These side wall panels may likewise be connected along a second fold line 25 parallel to the fold line 20 to corresponding end closure flaps 26, 27, 29 and 30.

As illustrated in the drawings the end flaps 21 and 23 are of smaller area than the end flaps 22 and 24 and in the sealing operation are usually folded into coplanar relationship. One of the flaps 22 or 24 is folded over the flaps 21 and 23 to overlie the same, and the other of these last named flaps is folded over the first. In the construction illustrated the flap 22 is designed to form the intermediate flap, while the flap 24 is designed to form the outermost flap.

A pair of spaced apertures 31 and 32 are provided in the flap 22. These apertures expose the portion of the upper surfaces of the flaps 21 and 23 in folded condition thereof. The arrangement of the flaps in partially folded condition is best illustrated in Figures 1 and 2 of the drawings.

As indicated in these figures, the carton blank A is first secured in tubular form by adhering the glue flap 17 to an edge of the panel 13. The end flaps at one end of the carton are then sealed. As the end flaps on one end of the carton can be sealed over a solid block or mandrel, this end of the carton can usually be made sift-proof with

little difficulty. Thus while both ends of the carton may be apertured, in practice it is necessary and desirable to aperture the closing flaps at only one end of the carton.

After the carton has been sealed in tubular form, the flaps 26 and 29 are folded into coplanar relation over a block or mandrel and the flaps 27 and 30 are folded over the same to form a tight seal. Sealing pressure may be applied to secure these flaps in superimposed relationship. A carton is thus formed having one sealed end, and the other end thereof is open for filling. After the contents have been placed in the carton A, the flaps 21 and 23 are folded into coplanar relation and the flap 22 is folded to overlie these innermost flaps. Adhesive is applied either to the upper exposed surfaces of the flaps 21 and 23 or to the undersurface of the flap 22 so as to provide a means of adhering these flaps together. After the flap 22 has been folded into place, suction is applied to the top of the carton acting to draw the smaller flaps 21 and 23 upwardly thereagainst. Thus a more effective seal may be provided between the innermost flaps 21 and 23 and the intermediate flap 22 than would otherwise be possible.

Adhesive is applied either to the upper surface of the flap 22, or to the under-surface of the flap 24, and this last named flap is folded to overlie the intermediate flap 22. The adhesive is thus allowed to enter the apertures 31 and 32, this adhesive forming a firm anchor to the walls of these apertures and sealing the innermost flaps and the outermost flap thereto. The edges of these apertures absorb the moisture in the glue more quickly than the surfaces thereof so that a portion of the adhesive is drawn into the stock, forming the intermediate lamination forming a firm anchor for the inner and outer flaps.

It will also be seen that if a fairly heavy layer of adhesive is provided between the various laminations, the apertures 31 and 32 will substantially fill up with adhesive forming a connection between the inner and outer laminations. Thus a more effective seal is obtained than is ordinarily possible in a carton of this type.

In Figures 5, 6, and 7 of the drawings I disclose a modified form of construction which is very similar to that previously described. The carton B shown in these figures includes side wall panels 33, 34, 35, and 36 which are foldably connected along fold lines 37, 39, and 40. A glue flap 41 is foldably connected to one end panel 33 along a fold line 42. End closure flaps 43, 44, 45 and 46 are foldably connected to one end of the panels 33, 34, 35, and 36, respectively along a fold line 47. Closure flaps 49, 50, 51, and 52 are foldably connected to the other ends of the respective wall panels along a common fold line 53.

One flap such as 50 designed to form an intermediate flap of the end closure is provided with spaced apertures 54, and 55 which overlie solid portions of the innermost flaps 49 and 51. The flap 52 which may form the outermost end flap is provided with spaced U-shaped cuts 56 and 57 which are in alignment with the apertures 54 and 55.

In sealing the carton the glue flap 41 is adhered to the wall panel 36 to produce a tubular carton. One end of the carton is then sealed

in the conventional manner if it is so desired. The contents are then placed within the carton B and the flaps 49 and 51 are folded into coplanar relationship. The flap 50 is next folded over the flaps 49 and 51 and a coating of adhesive is provided between these laminations of flaps. The flap 52 is also folded over and adhered to the flap 50.

Suction is applied to the top of the carton 10 preferably while the tabs 59 and 60 defined by the U-shaped cuts 56 and 57 are out of the plane of the remainder of the flap 52. Thus partial pressure enters the apertures 54 and 55 and 15 draws the flaps 49 and 51 up against the under-surface of the flap 50. Thus all of the flaps are sealed in coplanar relationship.

It will be noted that the tabs 59 and 60 can 20 enter the apertures 54 and 55 and directly adhere the innermost flaps to the outermost flaps. As a result a glued connection is provided between the innermost and outermost flaps, thus adhering these flaps more securely than would otherwise be the case. Furthermore in this structure as in the 25 previously described carton A, the adhesive between the laminations enters the apertures and is drawn into the cut edges of stock, forming the center lamination, thereby creating a better anchor for the adhesive than would otherwise be available. The seal thus effected is accordingly 30 superior to that of the usual sealed end carton and the tabs 59 and 60 substantially fill the apertures 54 and 55 and are but slightly bent inwardly from the plane of the remainder of the flap 52.

35 In accordance with the patent statutes, I have described the principles of construction and operation of my carton, and while I have endeavored to set forth the best embodiments thereof, I desire to have it understood that these are 40 only illustrative thereof, and that obvious changes may be made within the scope of the following claim without departing from the spirit of my invention.

I claim:

45 A carton comprising a series of side walls and an end closure, said end closure including flaps on two opposed side walls folded into superimposed relation, a flap on the third end wall folded over the innermost flaps to form an intermediate lamination, and a flap on the fourth side wall folded over said intermediate lamination to form an outer lamination, adhesive between said laminations, and apertures in the intermediate lamination spaced from the edges 50 thereof, said adhesive entering the apertures of 55 said intermediate lamination, and tabs formed in the flap forming the outermost lamination and foldable inwardly through said apertures and adhered to the innermost lamination.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
837,324	Mitchell	Dec. 4, 1906
2,084,106	Palmer et al.	June 15, 1937
2,266,649	Marshall	Dec. 16, 1941
2,330,045	Georgiou	Sept. 21, 1943
2,351,165	Vergobbi	June 13, 1944