

Nov. 2, 1948.

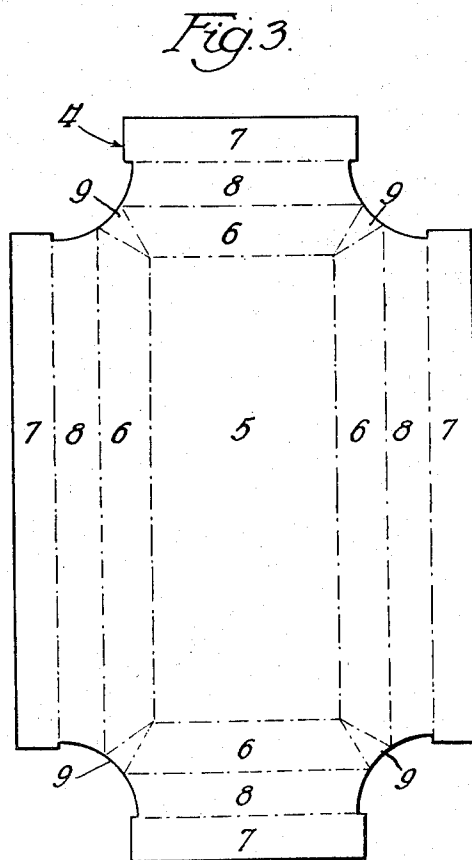
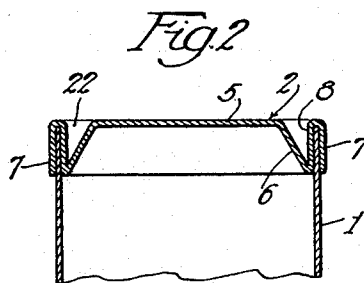
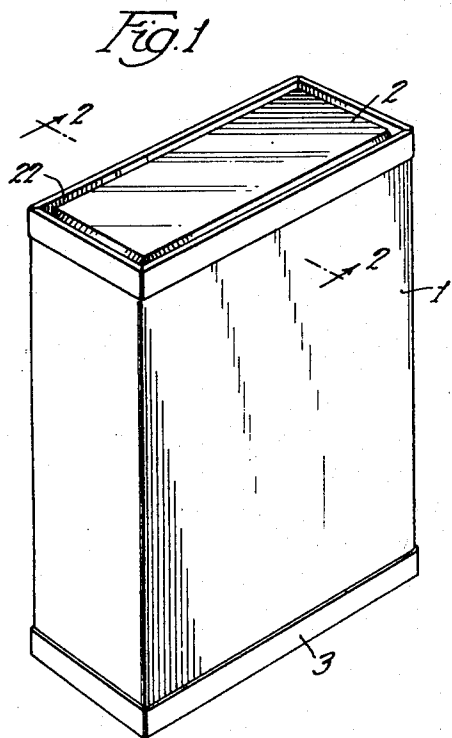
F. D. PALMER

2,452,952

CARTON

Filed July 3, 1944

3 Sheets-Sheet 1



Inventor
Frank D. Palmer
By: Soans, Pond & Anderson Attys.

Nov. 2, 1948.

F. D. PALMER

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Fig. 4.

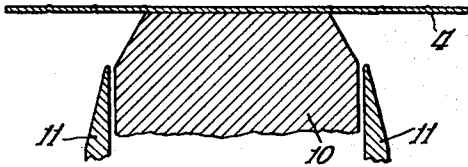


Fig. 5

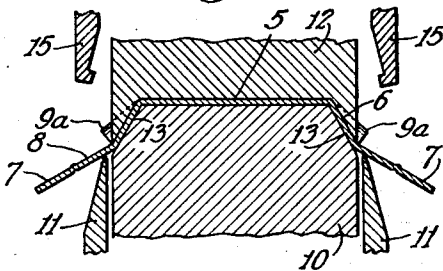


Fig. 6

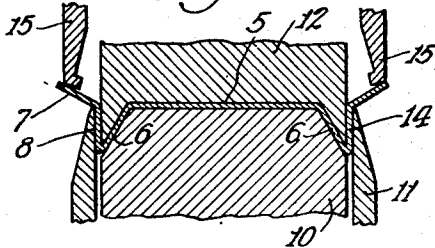


Fig. 7

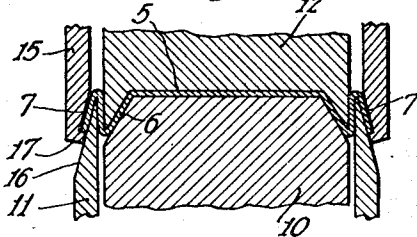


Fig. 8

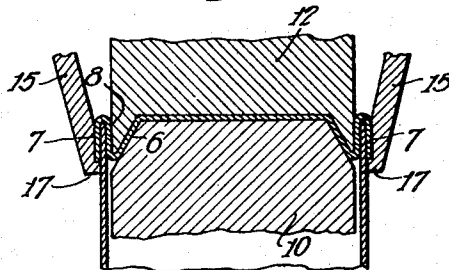
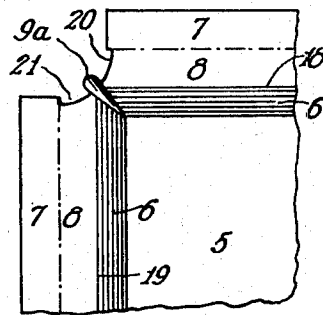


Fig. 9



Inventor
Frank D. Palmer.

By: Evans, Pond & Anderson
Attys

Nov. 2, 1948.

F. D. PALMER

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CARTON

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Fig. 10

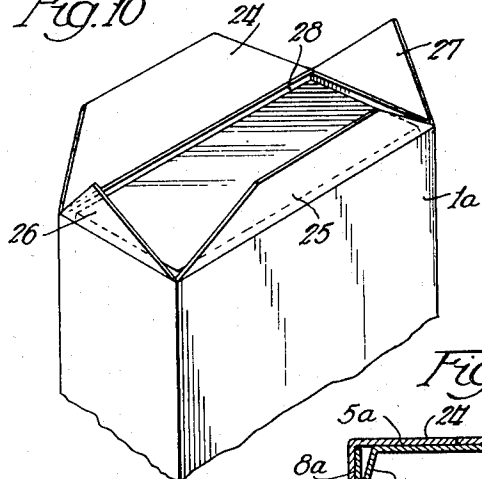


Fig. 11

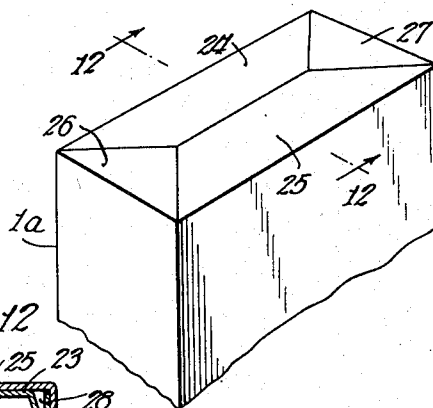


Fig. 12

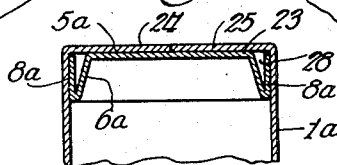


Fig. 13

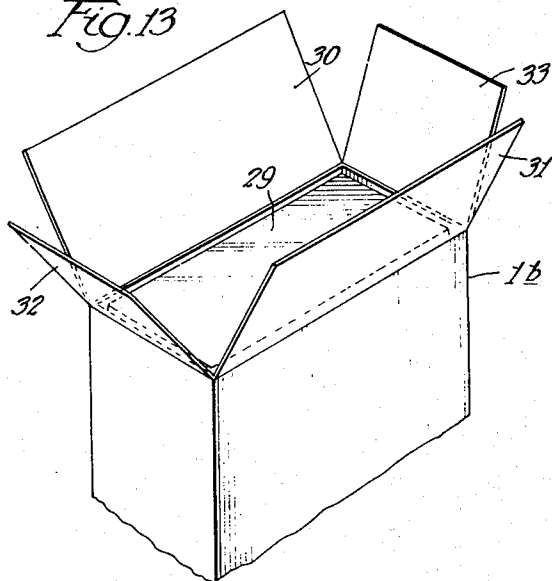
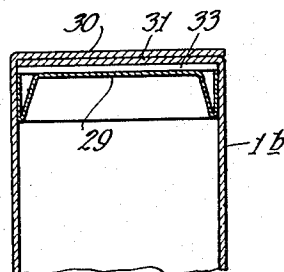


Fig. 14



Inventor
Frank D. Palmer
By: Soans, Pond & Anderson
Attys.

UNITED STATES PATENT OFFICE

2,452,952

CARTON

Frank D. Palmer, Chicago, Ill., assignor to F. D. Palmer, Inc., Chicago, Ill., a corporation of Illinois

Application July 3, 1944, Serial No. 543,312

3 Claims. (Cl. 229—5.5)

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This invention relates to the production of paperboard cartons or containers, and it has particular reference to certain features of end closure construction.

The main objects of the invention are to provide a paperboard carton with an end closure which may be easily and effectively secured to the body of the container in such a manner as to provide a hermetically sealed, sift-proof container; to provide a substantially flush end closure wherein attaching portions thereof enter within the container body; and other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawings (three sheets), wherein there is disclosed several forms of package construction embodying the present invention.

In the drawings, Fig. 1 is a perspective illustrating one form of the improved container construction;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a plan of a blank employed to form the end closure for the container shown in Figs. 1 and 2;

Figs. 4, 5, 6, 7 and 8 more or less diagrammatically illustrate successive steps in the formation and application of the improved end closure and its application to a container body;

Fig. 9 is a fragmentary plan illustrating a corner portion of the end closure blank in the partially formed condition shown in Fig. 5;

Fig. 10 is a fragmentary perspective of another container closure structure embodying some of the elements of the structure shown in Figs. 1 to 9 inclusive, together with certain additional features, the container being shown in partially closed condition;

Fig. 11 is a perspective corresponding to Fig. 10, but showing the structure in closed condition;

Fig. 12 is a section on the line 12—12 of Fig. 11;

Fig. 13 is a fragmentary perspective corresponding to Fig. 10 but showing another form of construction in partially closed condition, and

Fig. 14 is a section through the end closure of the structure shown in Fig. 13 when in fully closed condition.

The improved container structure herein illustrated comprises a tubular body member 1 which, in this instance, is illustrated as being of rectangular form. Said body accordingly has four side walls and it is formed in the usual manner from a single blank of material suitably scored so as to be foldable to the said rectangular tubular form, the opposite ends of the walls being suitably united by a glue flap or the like in the

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conventional manner. Both ends of the tubular body may be closed by the same type of end closure, one end being designated 2 and the other end 3. In the following explanation, reference will be made to the top end closure only.

The end closure may be formed from a blank 4, such as illustrated in Fig. 3. Said blank is suitably scored or creased to define a central or main end wall panel 5 and peripheral flange portions around said main panel. The peripheral flange portions are further scored so as to divide the same into inner portions 6, outer portions 7 and other, or intermediate, portions 8. The inner portions 6 have their adjacent ends integrally connected by web portions 9, and the adjacent ends of the outer and intermediate portions are separated from each other as shown.

A blank, such as illustrated in Fig. 3, is first subjected to certain forming operations, which are illustrated in Figs. 4 to 7 inclusive. The first step consists in placing the blank in proper position on the upper end of a punch member 10, which is relatively vertically movable within a surrounding sleeve-like member 11. After the blank is in place on the end of the punch member 10, a die member 12 is moved downwardly relative to the punch member 10 so as to fold the inner flange portions 6 to a downwardly and outwardly inclined position against the beveled or angular end wall portions 13 of the punch member 10. The sleeve-like member 11 is disposed in such position that its upper end engages the intermediate flange portions 8 to thereby effect a preliminary upward bending of the flange portions 8 and 7 relative to the inner flange portion 13. Thereupon, the sleeve 11 is moved upwardly relative to the punch member 10 and relative to the die member 12, so as to fold said intermediate flange portions 8 to vertically upwardly extending position against the side walls 14 of the lower end portion of the die 12. During such upward folding of the intermediate flange portions 8, the outer flange portions 7 engage the lower ends of depending hook-like members 15, which serve to bend or fold said outer flange portion 7 downwardly relative to the intermediate flange portions 8 (see Fig. 6). The punch 10 and die 12, together with the interposed and partially folded blank, are moved in unison upwardly within the surrounding members 15, which are thereby caused to continue the downward folding of said outer flange portion 7 until such flange portions are disposed in downwardly and upwardly extending position against the outer surfaces 16 of the sleeve member 11. The hook-like folders 15 are

so proportioned that when they reach their lowermost positions, the hook end portions 17 thereof will underlie the free edges of the then depending outer flange portions.

After the punch and die structure has operated to form the blank to the condition shown in Fig. 7, the die member 12, together with the folding members 15, are separated as a unit from the punch member 10 and sleeve 11. The formed end closure member will be retained in the die member 12, owing to the gripping effect of the hook-like folders 15. Thereafter, a carton body may be placed in position under the formed-up end closure member in the die structure 12, and the latter moved downwardly relative to the carton body, so as to cause the flange portions 7 and 8 to embrace a marginal end portion of the container body, substantially as shown in Fig. 1. The flange portions 7 and 8 may be adhesively coated on the surfaces thereof which engage the inside and outside surfaces respectively of the container body, and the folding member 15 may be so actuated as to exert pressure to squeeze the flange portions 7 and 8 and the intervening body portion tightly together, and against the lower end portion of the die 12. If preferred, the said flange portions 7 and 8 may be coated with heat sealable material, and either or both the die 12 and the folding members 15 may be electrically or otherwise heated so as to reactivate such heat sealing coating, to thereby effect attachment of the end closure to the marginal end portion of the container body. If desired, the end portion of the container body, or for that matter, the entire container body may also be coated with heat sealable material which may also serve the function of moisture-proofing the container. In such a case, the end closure should also be coated on either or both of its surfaces to co-operate with the body coating to render the container moisture and air impervious.

When the inner flange portions 6 are folded to their angular position shown in Fig. 5, the web portions 9, which join the adjacent ends of said inner flange portions, will buckle outwardly or be folded to an outwardly projecting position, as represented at 9a in Figs. 5 and 9. By inspection of Fig. 9, it will be seen that said outwardly folded web or gusset portion 9 projects outwardly beyond the normal planes of the inside surfaces of the container body, which would coincide approximately with the fold lines 18 and 19, about which the intermediate flange portions 8 are folded into upwardly extending position for application against the inside faces of the container walls. When the end closure member 5 is inserted into the container body, said buckled or folded web portion 9 is cramped into the corner of the container so as to completely fill and close the same, whereby an effective sift-proof corner seal is provided.

It will, of course, be understood that said web portion 9 is deformed from the condition illustrated in Fig. 9 to fit within the corner portion of the container, and that whether or not said connecting web is coated with adhesive or heat sealable material, an effective sift-proof seal will be produced because of the bulk of material cramped into the corner.

If desired, said corner web may also be coated with adhesive material, or with heat sealable material, to insure adhesive joining of said web portion with the container body. Said web portion 9 when buckled to the condition illustrated in 9a, will be disposed at least partially between

the adjacent ends 20 and 21 of the intermediate flange portions 8 when the latter are folded to their outwardly extending position against the inside of the container walls. As shown in Fig. 9, the flange portions 8 and 7 extend outwardly and downwardly from the fold lines 18 and 19, and it will be readily understood that when said intermediate portions 8 are folded to upwardly extending position, the ends 20 and 21 thereof will squeeze between them the buckled web portion 9a; hence, said buckled web portion serves to effectively fill any space which may otherwise occur between the ends of the intermediate flange sections 8, thereby avoiding possible leaks due to any failure to cause tight interengagement of said ends 20 and 21.

As shown in Fig. 2, the main or central panel 5 of the end closure 2 is substantially flush with the end of the container body 1, and there is provided a relatively narrow outwardly facing peripheral recess or groove 22 on the end of the container. Said outwardly facing groove or recess is of such narrow width as to be substantially unobjectionable, and it facilitates the application of pressure for tightly squeezing the flange portions 7 and 8 into engagement with the intervening marginal end portion of the container body 1. The elimination of a completely recessed end by the arrangement described, provides a substantially flush end package which facilitates stacking the packages one upon the other. The relatively small peripheral recess 22 provided in the described structure is much less objectionable than a fully recessed end closure from the standpoint of cleanliness.

In some instances, it may be desired to avoid even the presence of the relatively small peripheral recess 22, while at the same time retaining the advantages flowing therefrom in respect of secure and leakproof attachment of the end closure to the container body. One manner of accomplishing this purpose is represented in Figs. 10 to 12 inclusive, wherein the end closure member 23 corresponds to the end closure member 4, except that the outer portions 7 of the peripheral flange have been eliminated. The end closure 23 accordingly embodies a main panel 5a and a peripheral flange having an inner downwardly and outwardly inclined portion 6a and vertically upwardly extending portions 8a. The flange portions 8a may be adhesively united under pressure to the surrounding marginal end portion of the container body 1a in a manner similar to that in which the flange portions 7 and 8 are united to the body in the structure shown in Figs. 1 to 9 inclusive. In this modified arrangement, the walls of the container body are provided with end flaps 24, 25, 26 and 27, which are foldable inwardly into overlying relation to the end member 23, so as to cover the peripheral recess 28 of the end member 23.

As shown in Figs. 10 to 12 inclusive, the end flaps 24 to 27 inclusive are so proportioned or shaped that when they are folded into overlying relation to the end member 23, their edges will abut one another to form, in effect, a single ply cover over the end closure 23. The flaps 24 to 27 inclusive may, of course, be adhesively secured to the underlying closure portion 23 so as to hold the said flaps in closed position or, if preferred, a suitable seal or label may be applied over the outside of the closed flaps to hold the same in closed condition.

In the arrangement shown in Figs. 13 and 14, the end closure 29 is illustrated as being formed

of relatively thin sheet material, as compared with the heavier paperboard material contemplated in Figs. 1 to 12 inclusive. The end closure 29 may be formed of adhesively coated impervious paper or metal foil, or of heat sealable sheeting, and it may be secured to the surrounding marginal end portions of the walls of the container 1—b. The form of the end closure 29 may be the same as that explained above in connection with Figs. 10, 11 and 12, so that the end closure is wholly disposed within the container body with its main end wall or panel substantially flush with the end of the container body. The walls of the container body 1—b may be each provided with end flaps 30, 31, 32 and 33, of which the flaps 30 and 31 may be of such size as to overlie the entire end area of the container, while the flaps 32 and 33 each overlie substantially one-half such end area. The flaps 32 and 33 may be first folded inwardly into overlying relation to the end closure 29, after which the flaps 30 and 31 may be folded inwardly into overlapping relation to said flaps 32 and 33 and the end closure 29. Said flaps 30 and 31 are also then disposed in mutually overlapping relationship, and they may be adhesively, or otherwise united. If preferred, the flaps 30 to 33 inclusive may be held in their folded position by the application of a suitable seal or label secured to the flap 30 and extending downwardly and secured to a portion of the adjacent side wall of the container. Such an arrangement provides a convenient reclosable package, and the thin paper or foil end member may constitute a sealing member which is adapted to be broken when the package is to be opened. The insert end closure 29 constitutes, in effect, a frangible inner seal which is effectively protected against damage by the plural-ply-flap-formed cover.

The described structure is, of course, subject to certain modifications, while retaining the benefits of the described structure.

I claim:

1. A paperboard container having a plurality of side walls joined at their edges to form a tubular body, an end closure within said body, said end closure embodying a panel disposed substantially flush with the end of said body and provided with a peripheral flange having inner portions respectively corresponding to the walls of said body and extending inwardly of the latter, intermediate portions extending outwardly from said inner portions, outer portions refolded relative to said intermediate portions so as to be disposed outside of the body, marginal end portions of said body walls being disposed between and adhesively secured in face-to-face relation to said intermediate and outer flange portions, said closure also having web portions integrally connecting the adjacent ends of said inner flange portions, said web portions being normally foldable to outwardly projecting position between the adjacent

ends of said intermediate flange portions, and said web portions being cramped into the corners of said body to thereby form sift-proof corner seals.

2. A paperboard container comprising a tubular body having a plurality of side walls, and an end closure, said end closure embodying a panel disposed adjacent the plane of the end of said body and a peripheral flange, said flange having inner portions respectively corresponding to the walls of said body and extending inwardly of the latter and other portions extending outwardly from said inner portions in face to face engagement with the inside of the respective wall portions of said body, said closure also having web portions integrally connecting the adjacent ends of said inner flange portions, and said web portions being folded to outwardly projecting positions between the adjacent ends of said wall engaging flange portions and being cramped into the corners of said body to provide the container with sift-proof corner seals.

3. A paperboard container comprising a tubular body, and an end closure embodying a panel disposed adjacent the plane of the end of said body and a peripheral flange, said flange having an inner portion extending angularly outwardly from said panel and inwardly of said body and another portion extending outwardly from said inner portion in face to face engagement with the inside of said body and adhesively secured thereto, said flange portion providing an outwardly facing recess therebetween for facilitating the application of pressure to said interengaging flange and body portions for sealing the same together, said closure also having web portions integrally connecting the adjacent ends of said inner flange portions, said web portions being folded to outwardly projecting positions between the adjacent ends of said wall engaging flange portions and being cramped into corners of said body to provide the container with sift-proof corner seals, and said body being provided with end flaps extending from the ends of its walls and folded into outwardly overlying relation to said end closure, thereby to provide the container with a smooth and recess-free end wall.

FRANK D. PALMER.

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