United States Patent [19]

Solomon

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[54] **METHOD OF ASSEMBLING AND FILLING HINGED CONTAINERS**

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[21] Appl. No.: **434,802**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 185,510, Oct. 1, 1971, Pat. No. 3,813,025.

[30] **Foreign Application Priority Data**

Oct. 2, 1970 United Kingdom..... 46937/70

[52] **U.S. Cl.** **53/37;** 53/35; 53/158

[51] **Int. Cl.**..... **B65b 5/06;** B65b 19/12

[58] **Field of Search** 53/35, 37, 148, 236, 158

[56] **References Cited**

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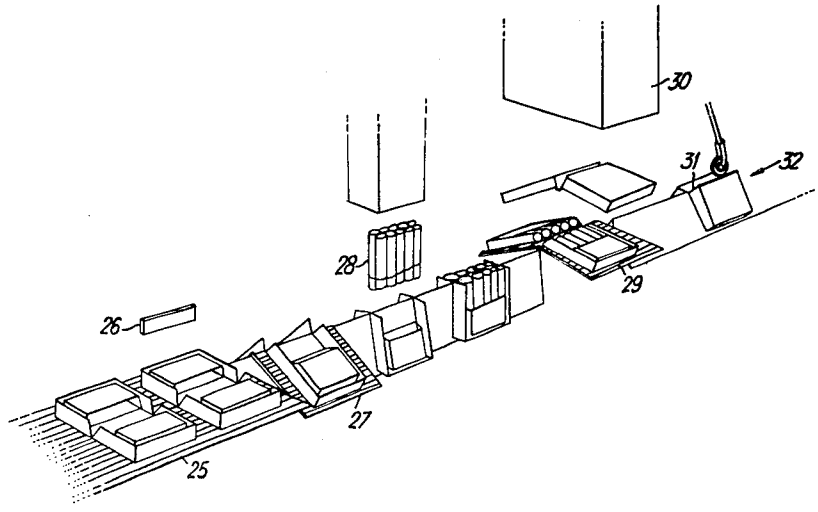
Primary Examiner—Robert L. Spruill

Attorney, Agent, or Firm—Browdy and Neimark

[57] **ABSTRACT**

An inner structural component of the container is formed of two sections each having a base portion lying out of the plane of and offset from a retaining strip for defining a pocket, the base portion and retaining strip being interconnected by a pair of opposite side walls, and the strip of one section being interconnected to the strip of the other section by a hinge line defined by a line of structural weakness. The inner component is initially oriented so that the retaining strips of each section faces downwardly, and the inner component is then bent along the hinge line until the retaining strips of the two sections are substantially juxtaposed and substantially vertically oriented. After products are inserted in each pocket of the section an outer structural component is placed over the filled inner component. The outer component has two sections each with a base portion juxtaposed to the respective base portions of the inner component, a pair of opposite side walls juxtapose to the respective opposite side walls of the inner component, and a pair of end walls connected one to the other by a line of structural weakness defining a hinge line juxtaposed to the hinge line of the inner component. The two components are secured together at least along their juxtaposed hinge lines.

4 Claims, 12 Drawing Figures



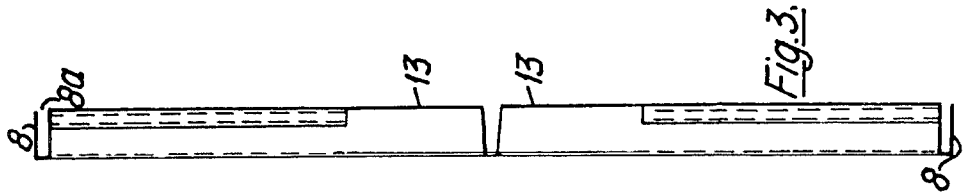


Fig.3.

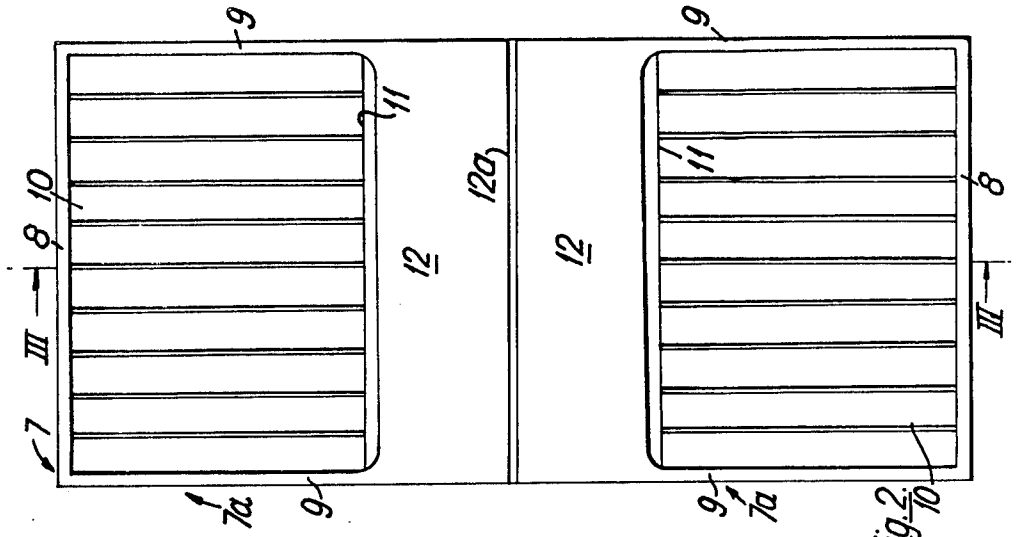


Fig.2.

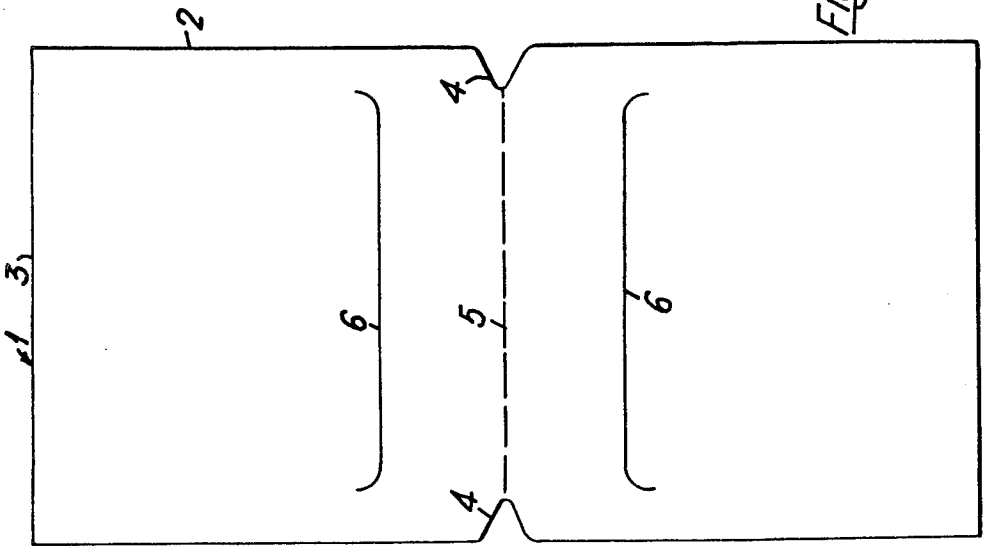


Fig.1.

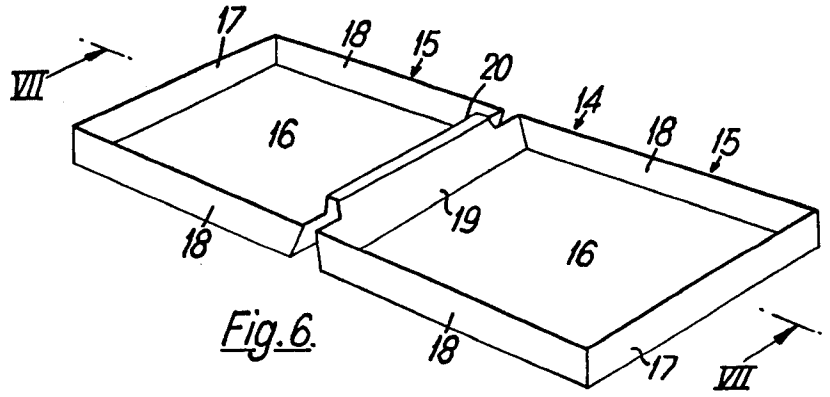


Fig. 6.

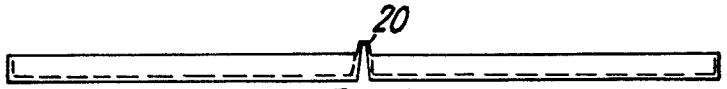


Fig. 7.

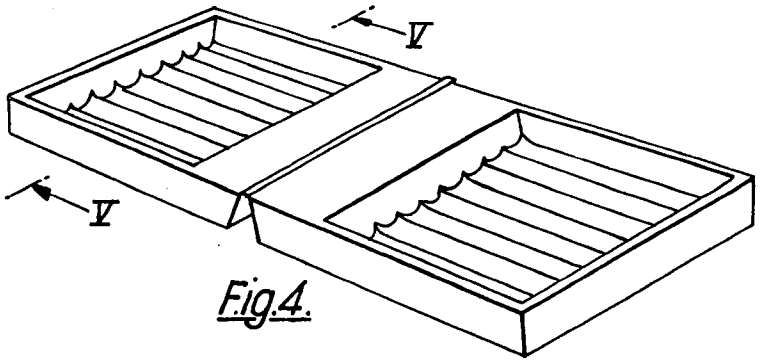


Fig. 4.



Fig. 5.

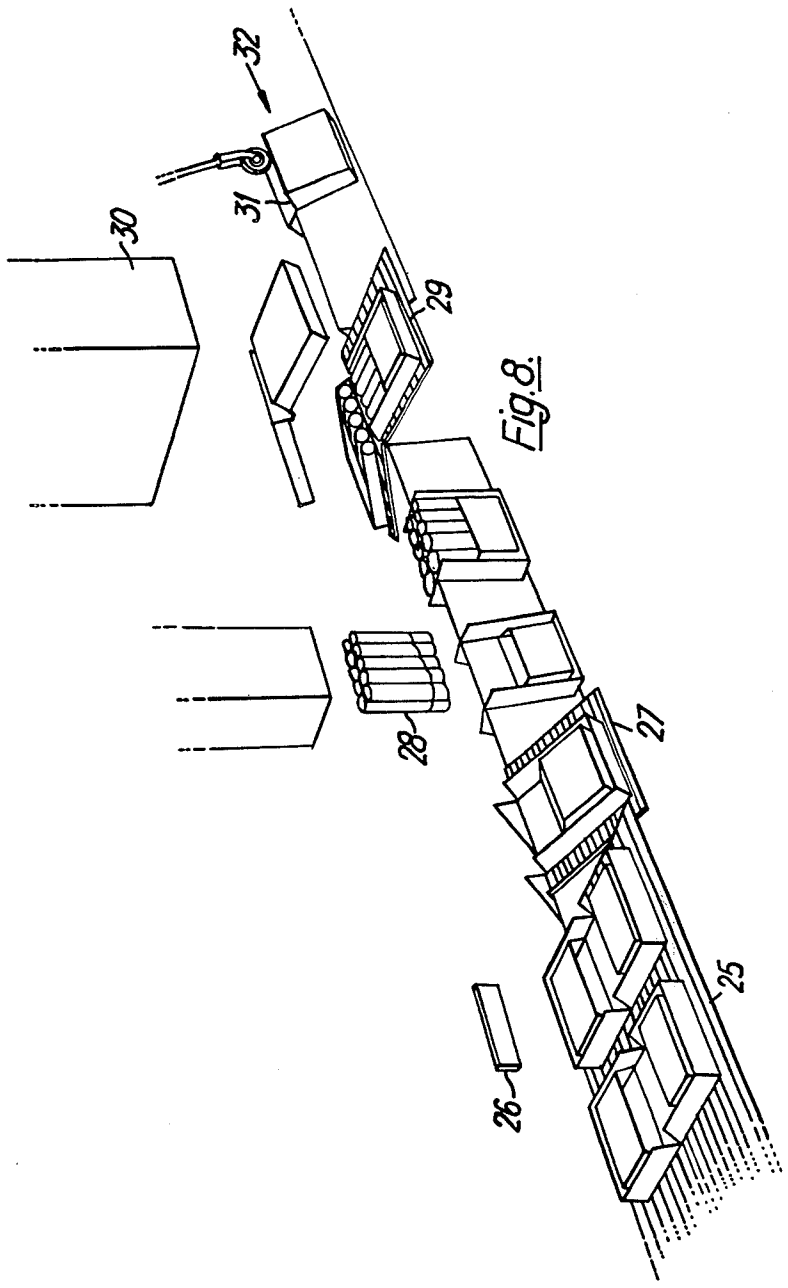


Fig. 8.

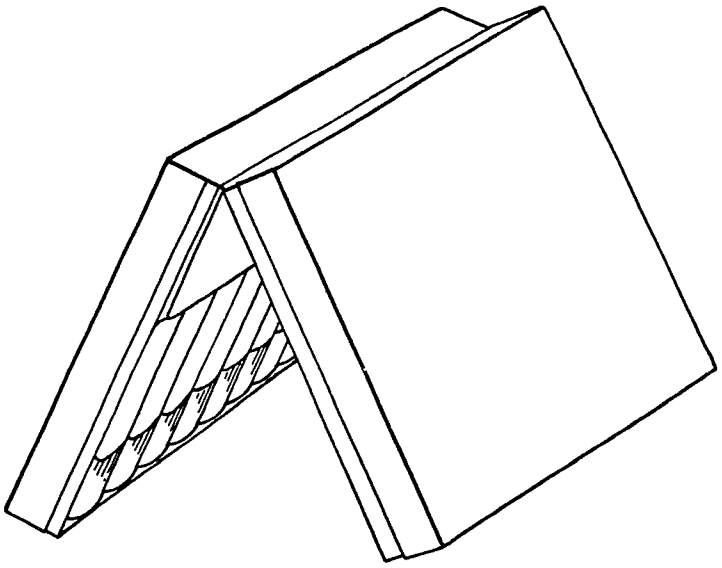


Fig. 9.

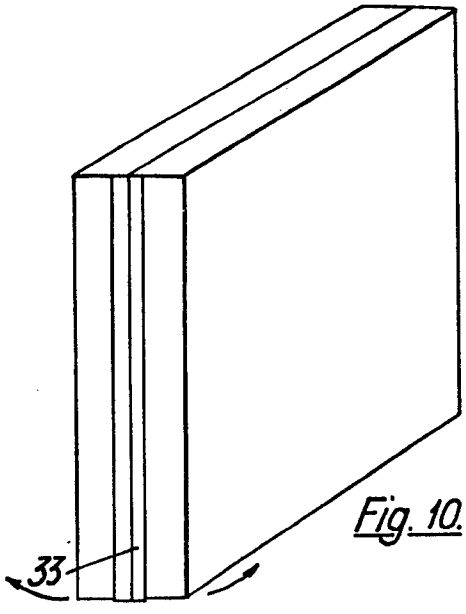
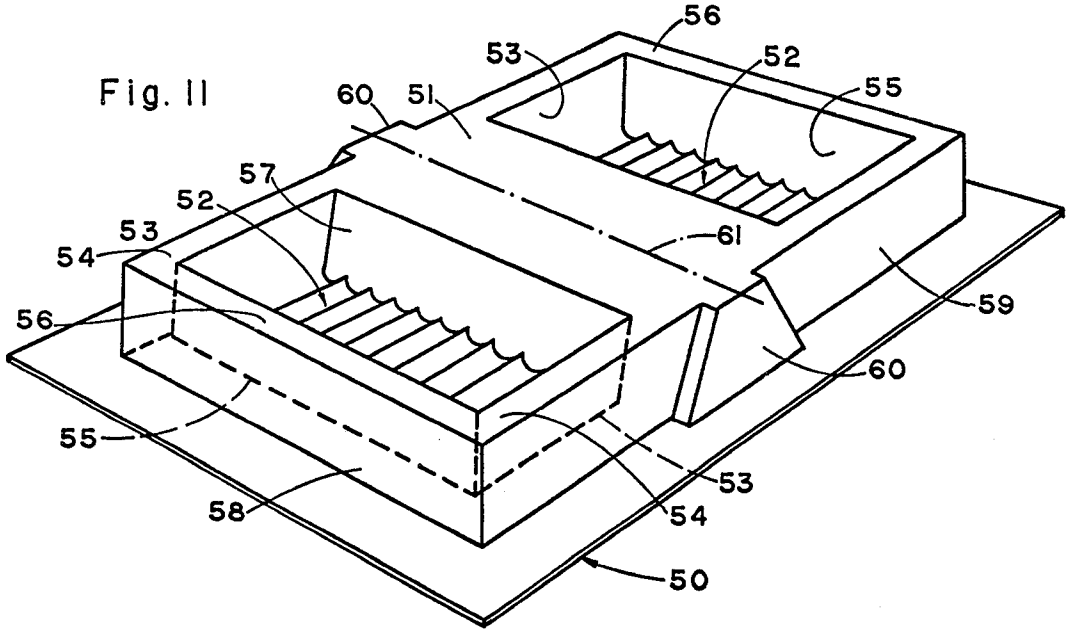


Fig. 10.

Fig. 11


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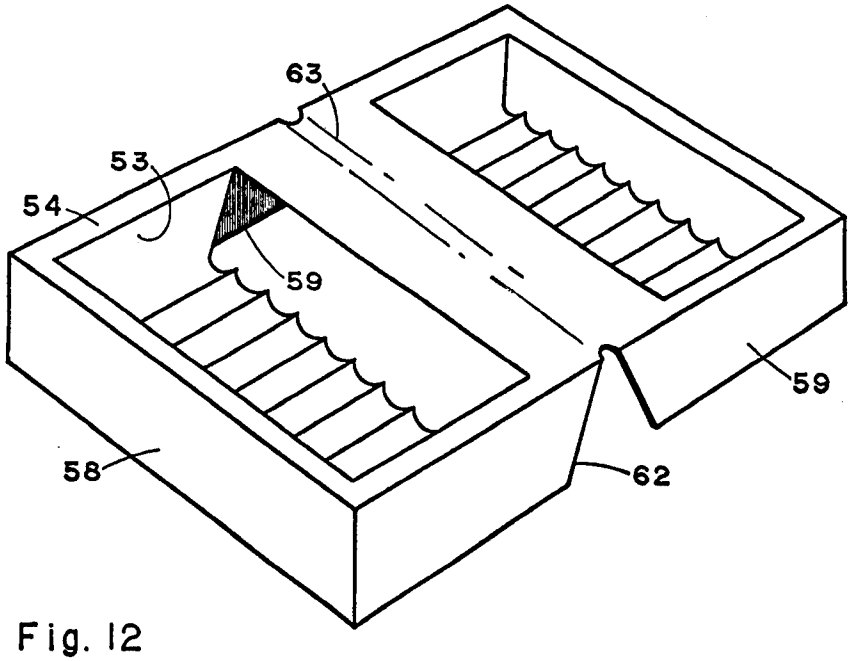

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Fig. 12

METHOD OF ASSEMBLING AND FILLING HINGED CONTAINERS

This is a continuation in part of application Ser. No. 185,510 filed Oct. 1. 1971 now U.S. Pat. No. 3,813,025.

This invention relates to a method of assembling and filling hinged containers.

Hinged containers to which the present invention is applicable have interconnected inner and outer structural components and are termed hereinafter, containers of the type described. The outer component of a container of the type described comprises at least two tray-like sections, each of which has a base portion with a pair of opposite side walls and a pair of opposite end walls, one end wall of one section being connected to one end wall of another section by a line of structural weakness defining a hinge line between the sections. The inner component likewise comprises at least two tray-like sections each of which has a base portion lying out of the plane of and offset from a retaining strip, the base portion and retaining strip being interconnected by a pair of opposite side walls. The strip of one section is connected to the strip of the other section by a line of structural weakness defining a hinge between the sections. The two components are nested so that the base portion, the side walls, and the hinge line of the inner component are juxtaposed to the respective base portions, the side walls, and the hinge line of the outer component. The components are secured together at least along their respective hinge lines to define a container that is opened or closed by pivoting the components about their hinge line.

The space between each retaining strip on the inner component and the base portion of the outer component nested therewith forms a pocket within which products packaged in the container are retained when the container is opened. Because the edge of each retaining strip is spaced from the end wall of the outer section, clearance is provided to effect removal of products from the pocket when the container is open. When the products are cigarettes, the spacing between the retaining strip and base portion is just larger than the diameter of a cigarette while the distance between the hinge line and the opposite end wall of the outer component is great enough to accomodate the length of a cigarette. A plurality of cigarettes, preferably ten, extending in a direction perpendicular to the hinge line can thus be stored in a row in each pocket of a container.

According to the present invention, there is provided a method of assembling and filling a container comprising the steps of:

a. providing an inner structural component of the container in the form of at least two-tray-like inner sections, each of which has a base portion lying out of the plane of and offset from a retaining strip for defining a pocket, the base portion and retaining strip being interconnected by a pair of opposite side walls, and the strip of one inner section being interconnected to the strip of the other inner section by a line of structural weakness defining a hinge line between the inner sections;

b. initially orienting the inner component so that the retaining strips face downwardly;

c. bending the inner component along its hinge line until the retaining strips of the two inner sections are substantially juxtaposed and substantially vertically oriented;

d. inserting products in each pocket of the sections by dropping such products substantially vertically in the pockets;

e. providing an outer structural component of the container in the form of two tray-like outer sections each of which has a base portion with a pair of opposite side walls and a pair of opposite end walls, one end wall of one section being connected to one end wall of another section by a line of structural weakness defining a hinge line between the outer sections;

f. placing the outer component in nesting relationship over the inner component so that the base portions, the side walls, and the hinge line of the outer component are juxtaposed to the respective base portions, the respective side walls, and the respective hinge line of the inner component; and

g. securing together the two components at least along their hinge lines.

For a better understanding of the present invention and to show how the same can be carried out in practice reference will now be made to the accompanying drawings in which:

FIG. 1 is a plan view of a blank used for constructing an inner structural component of one form of hinged container in accordance with the present invention,

FIG. 2 shows the structural component formed out of the blank shown in FIG. 1,

FIG. 3 is a longitudinal sectional view of the inner structural component shown in FIG. 2 taken along the line III—III,

FIG. 4 is a perspective view of the inner structural component shown in FIG. 2,

FIG. 5 is a cross sectional view of the inner structural component shown in FIG. 4 taken along the line V—V,

FIG. 6 is a perspective view of an outer structural component in accordance with the invention,

FIG. 7 is a longitudinally sectioned view of the outer structural component shown in FIG. 6 taken along the line VII—VII,

FIG. 8 shows schematically a container assembly and filling process in accordance with the invention,

FIG. 9 shows a filled container in accordance with the invention in an open position,

FIG. 10 shows a closed container in accordance with the invention,

FIG. 11 is a perspective view of another form of blank used in constructing an inner structural component shown in an intermediate stage of fabrication; and

FIG. 12 is a perspective view of a completed inner structural component made from the blank shown in FIG. 11.

As indicated above, hinged containers in accordance with the invention are formed of interfitting inner and outer structural components. As seen in FIG. 1 the inner structural component is formed of a substantially rectangular blank 1 formed of a thermo-plastic material such as, for example, polyvinyl chloride, having longitudinal walls 2 and side walls 3. The longitudinal walls 2 are formed with inwardly directed, substantially triangular notches 4 whose spices lie along a median line 5 of the blank 1. Transversely directed incisions 6 are formed in the blank parallel to the median line 5 and equally spaced therefrom.

The next stage in the process of constructing the inner structural component consists in processing the blank 1, shown in FIG. 1, by standard vacuum or pressure forming techniques so as to constitute an inner

structural component 7 as shown in FIGS. 2 to 5 of the drawings. The component 7 thus formed consists essentially of the two tray-like sections 7*a* each having a doubled over end wall 8 with an inlet 8*a* and a pair of side walls 9.

Each tray section 7 is formed with a base 10 which, as shown in the drawings, is suitably corrugated during the forming process so that it can conveniently accommodate substantially cylindrical contents, for example, cigarettes.

The base 10 of each section 7 extends from the end wall 8 (with which it is formed integrally) to an edge 11 which corresponds to the incision 6 in the blank 1 and is formed integrally with doubled over portions of the side wall 9.

The central portion of the component 7 is offset with respect to the base 10 and constitutes a pair of retaining strips 12 formed integrally with the outer side walls 9 of the structural component and located above corresponding apertures 13, formed in the underside of the component as seen in FIG. 2. The strips 12 are joined together by a line of weakness which constitutes a hinge line 12*a* and which coincides with the median line 5 of the blank 1.

As seen in FIGS. 6 and 7 of the drawings the outer structural component 14 also consists of a pair of tray-like sections 15 having planar base portions 16, outer end walls 17 and side walls 18. The tray-like sections 15 are furthermore provided with a pair of adjacent inner end walls 19 which, in the example described, project, at least in their central portion, beyond the corresponding edges of the side walls 18 and are integrally united at a hinge line 20.

The outer structural component 14 just described is also preferably made by vacuum or pressure forming of a thermoplastic material but can, if desired, also be formed of carton or other paper-like material.

Reference will now be made to FIG. 8 of the drawings which illustrates one form of assembly of a hinged container using inner and outer structural components 7 and 14 as just described whilst at the same time filling the container with its contents which, in the present example, are cigarettes.

As seen in FIG. 8, inner structural components 7 of the kind shown in FIGS. 2 to 5 of the drawings are successively placed on a non-magnetic conveyor 25 and are located on this conveyor in such a position that the underside of the tray base portions 10 as seen in FIG. 2 are uppermost as are the apertures 13 and the open ends 8*a* of the doubled over walls 8.

In this position there are inserted into the doubled over end walls 8 magnetized silvers. The inner structural component 7 provided with its magnetized silvers 26 now proceeds onto a metallic guide 27 to which it clings under the influence of the magnetized silvers 26 and this metallic guide 27 holds the inner structural component 7 as the tray-like sections 7*a* of the latter are folded towards each other about their hinge line 12.

When in this folded over position, the apertures 13 are located uppermost and the inner structural component 7 is in the position, shown in FIG. 8 wherein it can received two aligned sets of cylindrical objects 28 such as, for example, cigarettes, cigars, pencils or the like which are retained between the lowermost base 10 and the uppermost retaining strip 12 on each side. (In order to facilitate the introduction of the cylindrical objects in position where the base portions have been corrugated as shown in FIGS. 2 to 4 of the drawings, it can be arranged that the degree of corrugation tapers off from the end wall 8 to the edge 11).

The thus filled inner structural component is then moved onto a portion 29 of the conveyor wherein the two tray sections 7*a* are caused to move outwardly into a substantially aligned position and in this position there is dispensed, from an outer structural component dispenser 20 an outer structural component 10 which fits over the inner structural component 7, the hinge line 20 of the outer structural component being juxtaposed on the hinge line 12*a* of the inner structural component and the side and end walls of the outer structural component lying against the side end walls of the inner structural component. In this position the two structural components are secured together at least at their juxtaposed hinged lines, but also preferably around their side walls, for example, by high frequency heat welding. The welding together of the two juxtaposed hinge lines results in the production of a container hinge 31.

The now formed and filled container 32 moves off the conveyor belt and the two portions thereof close together when brought towards each other under the influence of the juxtaposed magnets 26.

The semi-opened container 32 is shown in FIG. 9 of the drawings which clearly shows the contents, in this case cigarettes, held in position in the container by the retaining strips formed integrally with the side walls.

In the particular example described above the side walls 18 of the outer structural component 14 are of slightly lesser depth than the side walls 9 of the inner structural component but on the other hand the inner end walls 19 of the outer structural component at least in their central portion are equal in depth to the inner side walls 8 of the inner structural component 7. Under these circumstances there is left exposed in the assembled container 32 a peripheral strip 33 of the inner structural component 7 and where, as is preferably the case, the inner structural component 7 is provided with a metallized surface this exposed strip provides an attractive contrast with the surrounding appearance of the outer structural component 14. It will be realized, however, that both the outer and inner structural components 7 and 14 can have side and end walls of equal height.

The assembled filled container can then be suitably packaged, for example, in a cellophane wrapping on which can be imprinted advertising, identifying or other matter. It will furthermore be appreciated that whilst, in the examples described above, the retaining strips 12 have been formed adjacent the container hinge, equivalent constructions can be envisaged wherein the retaining strips are formed adjacent the outside edges of the container.

Instead of forming the inner structural component shown in FIGS. 2–5 from the blank shown in FIG. 1, the component can be formed in the manner shown in FIG. 11 to which reference is now made. The first step involves deforming a sheet 50 of thermoplastic material such as polyvinylchloride in the manner shown in FIG. 11 using a standard vacuum or pressure forming technique. The deformed sheet has a central portion 51 lying in a plane spaced from a pair of depressed, equal-sized rectangular base portions 52 each of which has a pair of parallel side edges and a pair of parallel end edges. Each of the pair of parallel side edges are con-

nected by side walls **53** to side margins **54** coplanar and integral with the central portion **51.** The far edge end of each of the base portions is connected by end wall **55** to the side walls **53** and to an end margin **56** coplanar and integral with the side margins **54.** The near end edge of the base portion is connected by an end wall **57** to the side walls **53** and to the central portion **51.** To each end margin is connected a skirt **58** that overlies and is spaced from end wall **55.** Skirt **58** is likewise connected to the side skirts **59** which are connected to the side margins **54** and overlie and are spaced from the side walls **53.** The skirts **58** and **59** are also connected to themselves along their adjoining edges and to the sheet **50.**

Projecting outwardly from each of the skirts **59** is a generally triangular extension **60** centrally located on the side skirt. The apex of each of these triangular extensions is directed towards the central portion **51** and bisect the central portion **51** and bisect the central portion. Finally, the base portions **52** may be corrugated in a direction perpendicular to the line **61** bisecting the central portion **51.**

The blank of FIG. **11** is now in an intermediate stage of fabrication; and the final configuration shown in FIG. **12** is achieved by carrying out three operations:

1. Trimming the skirts from the remainder of the blank along the line of connection and severing the projection **60** on each of the side skirts to form a triangular notch **62** as shown in FIG. **12;**

2. Creasing the center portion **51** along the line **61** bisecting the central portion to form a line **63** of weakness extending between the apices of the triangular notches **62;** and

3. Removing from the deformed sheet the two walls **57** that connect the central portion to the respective base portions **52.**

The result of carrying out these operations is to achieve an inner structural member like that shown in FIG. **4.**

I claim:

1. A method of assembling and filling a container comprising the steps of:

a. providing an inner structural component of the container in the form of at least two tray-like inner sections, each of which has a base portion lying out of the plane of and offset from a retaining strip for defining a pocket, the base portion and retaining strip being interconnected by a pair of opposite side walls, and the strip of one inner section being interconnected to the strip of the other inner section by a line of structural weakness defining a hinge line between the inner sections;

b. initially orienting the inner component so that the retaining strips face downwardly;

c. bending the inner component along its hinge line until the retaining strips of the two inner sections are substantially juxtaposed and substantially vertically oriented;

d. inserting products in each pocket of the sections by dropping such products substantially vertically in the pockets;

e. providing an outer structural component of the container in the form of two tray-like outer sections each of which has a base portion with a pair of opposite side walls and a pair of opposite end walls, one end wall of one section being connected to one end wall of another section by a line of structural weakness defining a hinge line between the outer sections;

f. placing the outer component in nesting relationship over the inner component so that the base portions, the side walls, and the hinge line of the outer component are juxtaposed to the respective base portions, the respective side walls, and the respective hinge line of the inner component; and

g. securing together the two components at least along their hinge lines.

2. A method according to claim **1,** including the steps of:

a. providing on each section of the inner component a double-over end wall in the form of an end wall connected to the base portion and the pair of opposite side walls, a margin connected to the end wall and lying in the plane of the retaining strip, and a skirt connected to the margin spaced from and overlying the end wall for defining an inlet that opens upwardly when the inner component is initially oriented; and

b. inserting a magnetic element into each inlet in the inner component prior to the step of placing the outer component in nesting relationship to the inner component.

3. A method according to claim **2** including the step of providing a vertically oriented magnetic guide with which the magnetic elements are cooperable for holding the inner component bent along its hinge line such that the retaining strips are substantially juxtaposed prior to insertion of products into the pockets of the sections.

4. A method according to claim **3,** including the step of securing the skirt on each section of the inner component to respective juxtaposed end walls on the sections of the outer component after the latter has been placed in nesting relationship to the inner component.

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