United States Patent [19]

Solomon

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[45] **May 28, 1974**

[54] **HINGED CONTAINER**

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[73] Assignee: **British & Foreign Tobacco Company Limited,** London, England

[22] Filed: **Oct. 1, 1971**

[21] Appl. No.: **185,510**

[30] **Foreign Application Priority Data**

Oct. 2, 1970 Great Britain 46937/70

[52] **U.S. Cl.** ..... **229/2.5,** 229/44 R, 220/31 S

[51] **Int. Cl.** **B65d 1/00,** B65d 5/66

[58] **Field of Search** ..... 229/2.5, 44; 206/45.19, 206/41 H, 41.2 B; 220/31 S

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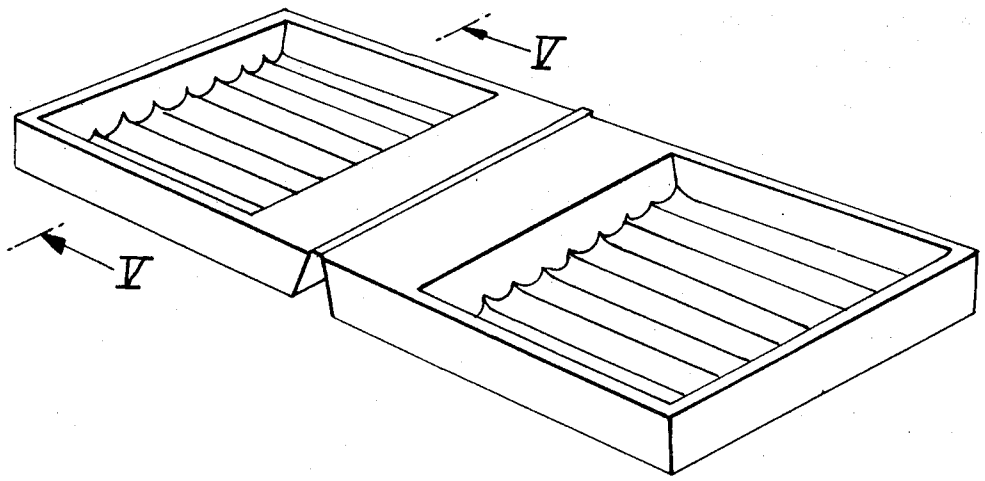
Primary Examiner—Davis T. Moorhead

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[57] **ABSTRACT**

A hinged container which consists essentially of interfitting inner and outer structural components which are coupled together by a hinge line, one of the components being formed so as to accommodate the container content. The invention also relates to methods of forming the constituent components and their assembly to form the container. Essentially the invention relates to a method for the simultaneous assembly of the container and its filling.

4 Claims, 13 Drawing Figures



PATENTED MAY 28 1974

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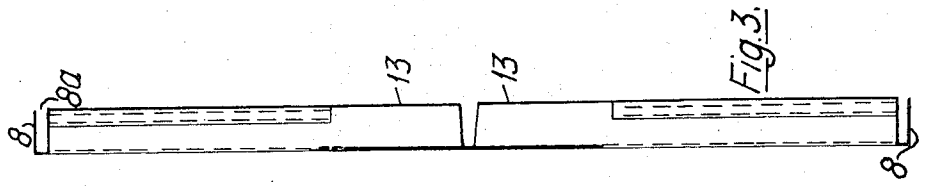


Fig. 3.

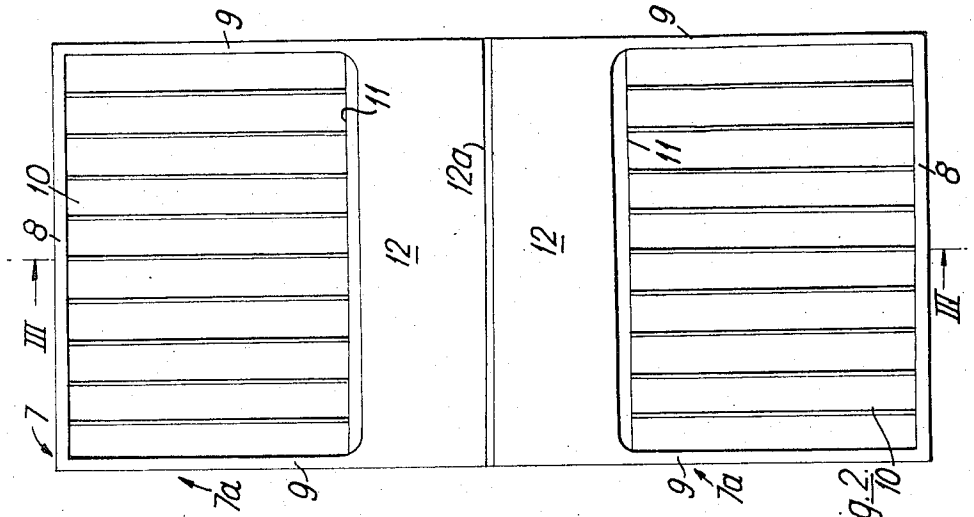
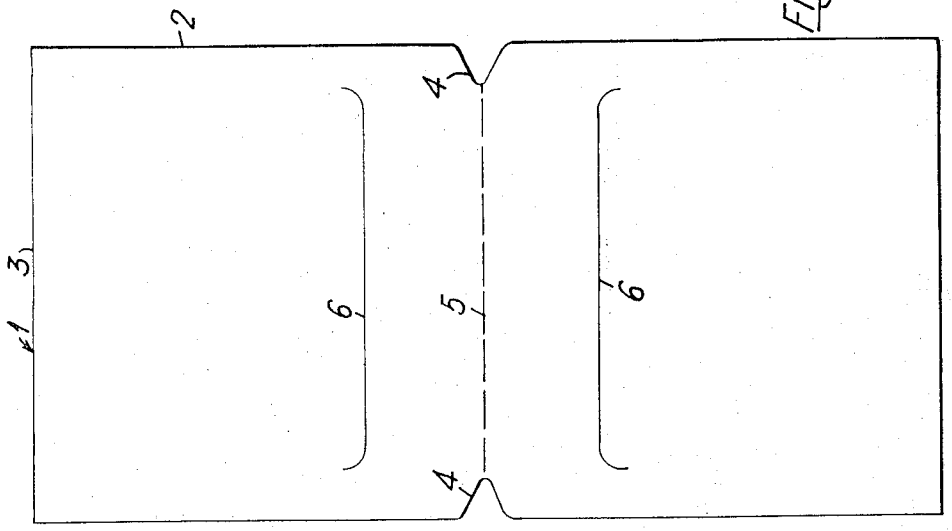


Fig. 2.

Fig. 1.



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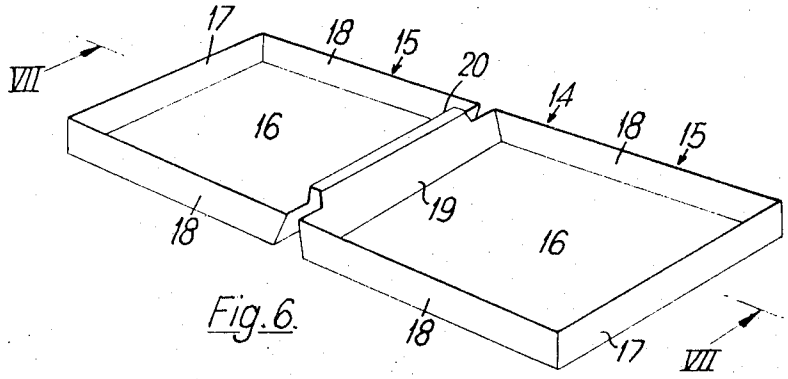


Fig. 6.

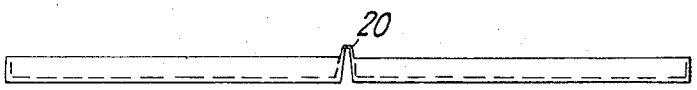


Fig. 7

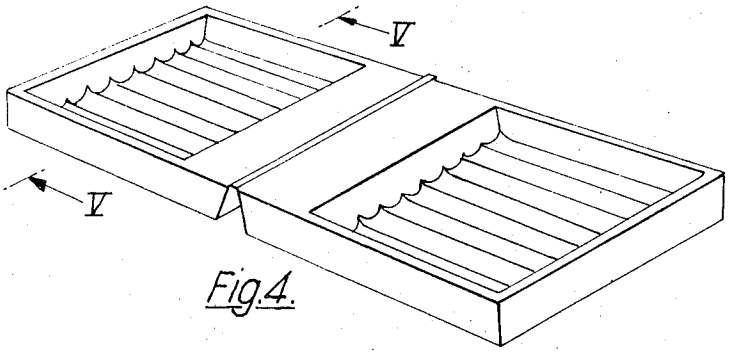


Fig. 4.



Fig. 5.

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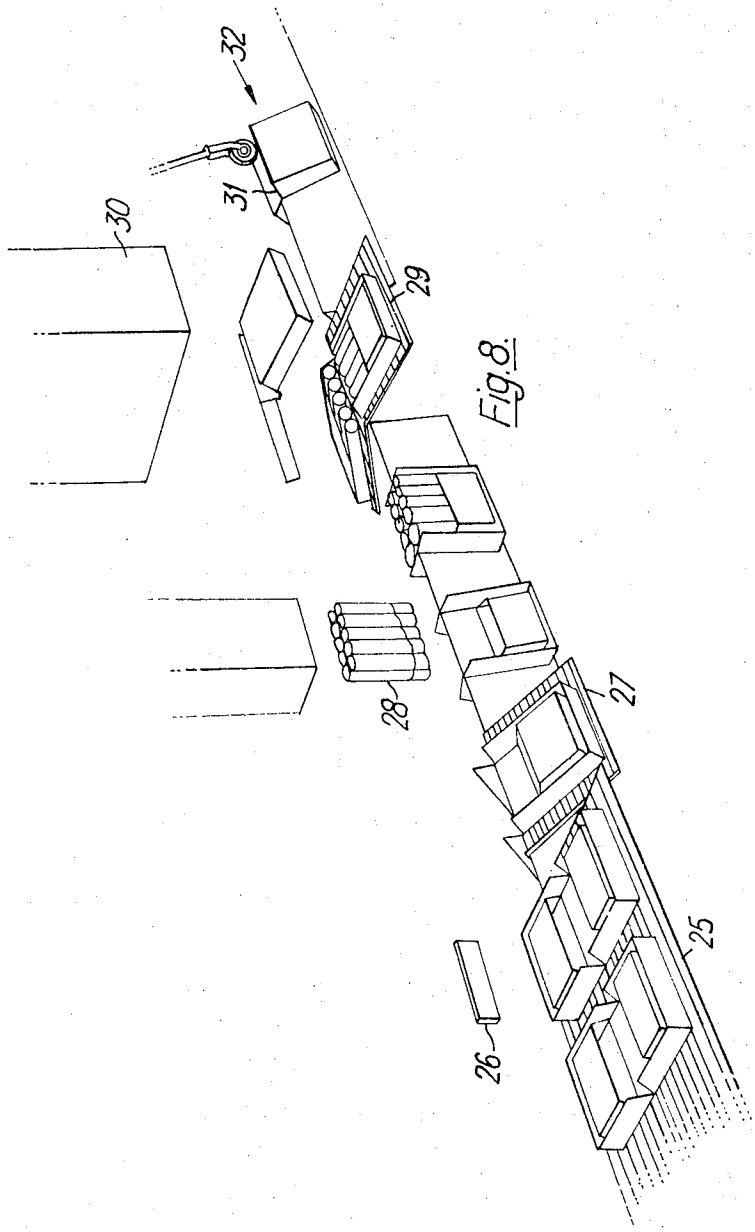


Fig. 8.

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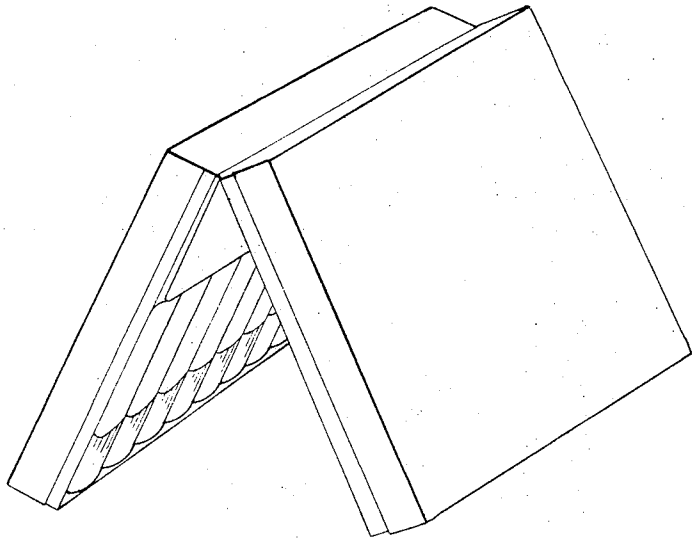


Fig. 9

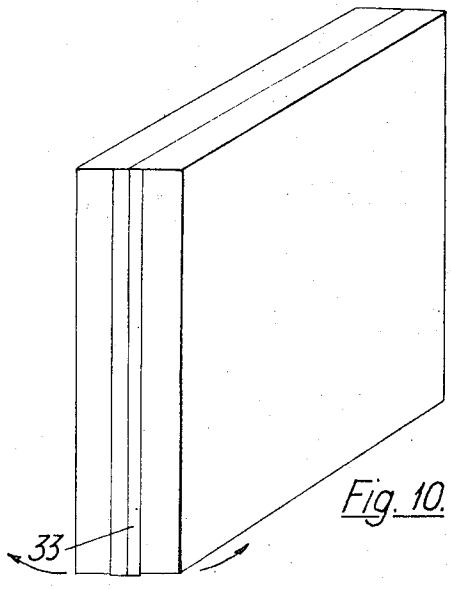


Fig. 10.

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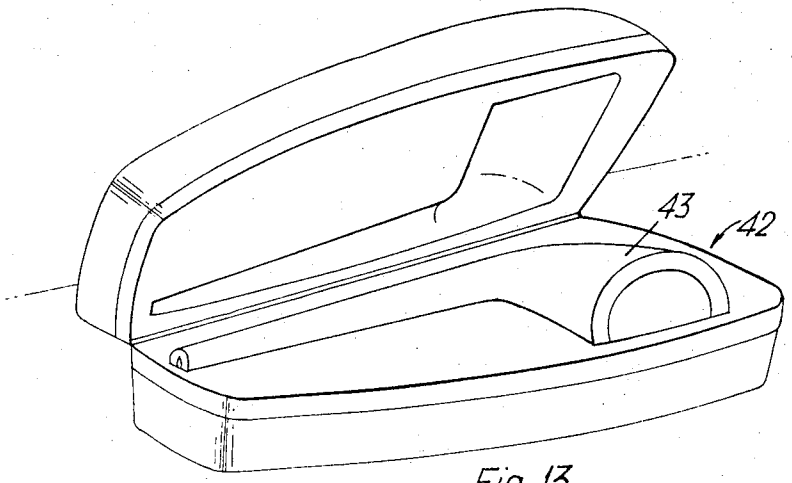


Fig. 13.

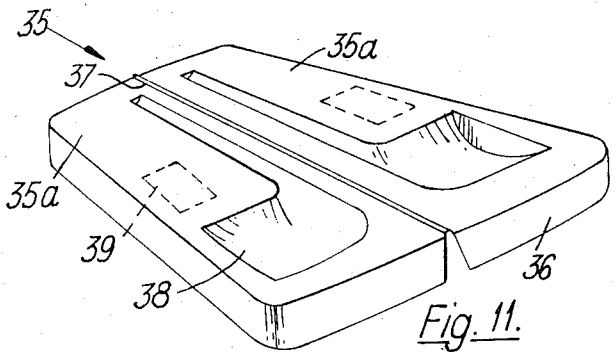


Fig. 11.

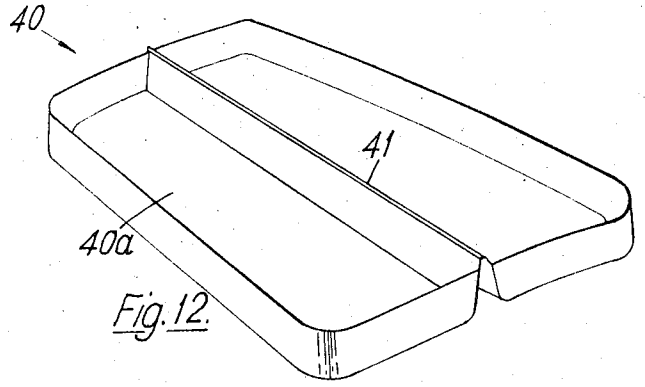


Fig. 12.

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HINGED CONTAINER

This invention relates to hinged containers and methods for their manufacture, assembly and filling.

According to the present invention there is provided a hinged container comprising inner and outer structural components each structural component comprising at least two sections separated by a hinge line, the structural components being secured together at least at their hinge lines to form at least one container hinge and to constitute at least two complementary container portions each consisting of corresponding inner and outer sections of the structural components, at least one section of the inner structural component being formed with one or more recesses and/or cutouts adapted to accommodate the container contents whilst the sections of the outer structural component respectively enclose or cover the sections of the inner structural component, the container portions being pivotable about their hinge(s) to and from a position wherein two inner sections are juxtaposed.

Preferably each structural component comprises a pair of tray-like sections which are integrally coupled together at a common edge of adjacent side walls constituting a hinge line, the sections of the inner structural component fitting within sections of the outer structural component with the side walls of the inner structural component sections juxtaposing the corresponding side walls of the outer structural component sections.

In accordance with a preferred embodiment of the invention each tray-like section of the inner structural component comprises a base portion formed with an aperture which extends substantially across the width of the section and with a retaining strip formed integrally with upper edges of the side walls of the section and superimposed on said aperture.

In accordance with a further aspect of the present invention there is provided a method of manufacturing an inner structural component of the kind just defined from a thermoplastic sheet blank in which is formed a pair of transverse incisions on either side of a median line comprising the step of subjecting said sheet blank to vacuum or pressure forming so as to form said tray-like sections having base portions which extend up to said incisions and retaining strip portions offset with respect to the base portions.

Preferably said retaining strips are constituted by the sheet blank portions intermediate said incisions.

In accordance with a further aspect of the present invention there is provided a process for the combined assembly and filling of said containers with their contents comprising the steps of successively feeding each inner structural component on a conveyor belt with said apertured portions facing downwardly, bending each component about its hinge line into a position wherein said retaining strips are substantially juxtaposed, feeding said contents into each tray-like section, placing said outer structural component on the filled inner structural component so as to enclose it and so that the hinge lines of the two components are disposed adjacently and securing said hinge lines together,

In accordance with one preferred embodiment of this process the manufacture of the container structural components, the assembly of the components to form the container and the filling of the container with its contents constitutes a continuous process.

Preferably magnetic means are provided for releasably retaining the container portions in the closed position of the container.

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 a second form of inner structural component in accordance with the invention,

FIG. 12 is a perspective view of a second form of outer structural component in accordance with the invention, and

FIG. 13 is a perspective view of a container formed with the components shown in FIGS. 11 and 12 and containing a pipe.

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 sturctral 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 8a 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 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 slivers. The inner structural component **7** provided with its magnetized slivers **26** now proceeds onto a metallic guide **27** to which it clings under the influence of the magnetized slivers **26** and this metallic guide **27** holds the inner structural component **7** as the tary-like sections **7***a* of the latter are tray-like 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 receive 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 **7** 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 **30** 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 hinge 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 **16**.

The semi-opened container **32** is shown in FIG. **9** of the drawings which dearly 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.

FIGS. **11** to **13** show an alternative construction of a container in accordance with the present invention. With this construction an inner structural component **35** as shown in FIG. **11** of the drawings constitutes a pair of tray-like sections **35***a* with downwardly extending side and end walls **36** integrally coupled together at a hinge line **37** and in which is formed a pair of recesses **38** corresponding to the shape of a pipe. Secured to the underside of the tray sections **35***a* shown in FIG. **11** of the drawings is a pair of magnets **39**.

An outer structural component **40** shown in FIG. **12** of the drawings also consists of a pair of tray-like portions **40***a* coupled together at a hinge line **41**. In assembly the inner structural component **35** is inserted in the outer structural component **40** with the hinge lines **37** and **41** abutting and the two components are secured together for example by high frequency heat welding at their hinge lines and around the side walls whereupon there is formed a container **42** such as shown in FIG. **13** of the drawings which can accommodate suitably shaped contents, in this case a pipe **43**.

In all cases the inner and outer structural components can be formed of similar or differing materials having similar or differing appearances and colours.

Whilst in the manufacturing process described schematically with reference to FIG. 8 of the drawings the assembly of the container and its filling is described apart from the formation of the structural components, it will be realized that both the formation of the structural components by stamping out and the subsequent assembly of the components and their filling to form containers can be part of a continuous process.

It will furthermore be realized that during the forming process the structural components can have any desired pattern imparted thereto and if required the outer structural component can be suitably apertured in which case the thus revealed portions of the inner structural component can provide an attractive pattern printing or the like.

Finally, whilst the invention has been specifically described with reference to a hinged container comprising two hinged together portions it will be understood that the invention is equally applicable to hinged containers comprising more than two such portions.

I claim:

1. A hinged container comprising an outer pair of tray like sections, each outer section having a base portion, a pair of opposite side walls and a pair of opposite end walls, an adjacent pair of end walls of said outer sections being integrally coupled together at a common edge thereof remote from said base portions and constituting an outer hinge line, an inner pair of tray like sections fitting respectively in said outer pair of tray like sections, each inner section comprising a base portion juxtaposing the corresponding base portion of the corresponding inner section and having formed therein an aperture extending substantially along the width of the inner section, a pair of opposite side walls juxtaposing corresponding side walls of the corresponding inner section, an end wall juxtaposing the end wall of the corresponding inner section remote from the hinge line, a retaining strip formed integrally with side walls of the inner section and extending over said aperture in a plane spaced from the said base portion, the retaining strips of said inner sections being integrally coupled to each other about a common edge thereof constituting an inner hinge line, said inner sections being open ended adjacent to said inner hinge line, said inner and outer sections being secured together at their hinge lines so as to form a pair of complementary container portions which are pivotable about their common hinge to and from a position where the portions are juxtaposed.

2. A hinged container according to claim 1 wherein the side and end walls of the inner sections are constituted by double wall structures, each double wall structure comprising a pair of wall elements which are integrally connected at a common edge thereof.

3. A hinged container according to claim 1, wherein side walls of the outer structural component are of slightly less depth than side walls of the inner structural component.

4. A hinged container according to claim 1, wherein magnetic means are provided for releasably retaining the container portions in the closed position.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,813,025

DATED : May 28, 1974

INVENTOR(S) : Arieh Solomon

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 6, lines 2, 5 and 7, delete "inner" and insert --outer--

Signed and Sealed this

first Day of June 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,813,025 Dated May 28, 1974

Inventor(s) Arieh SOLOMON

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 45, "tary-like" should read --tray-like--

Column 3, line 46, "tray-like" should read --folded--

Signed and sealed this 17th day of September 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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