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COMPOSABLE CONTAINER STRUCTURE CONSISTING OF SHEET-LIKE MATERIAL

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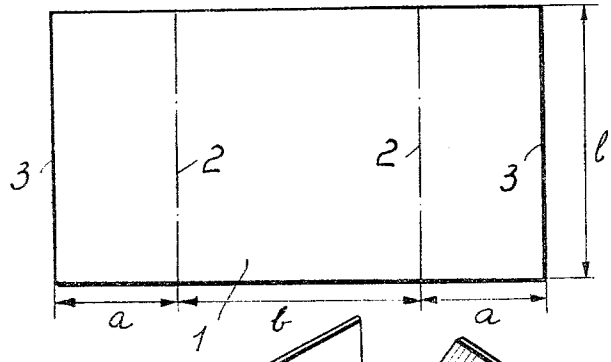


Fig. 1

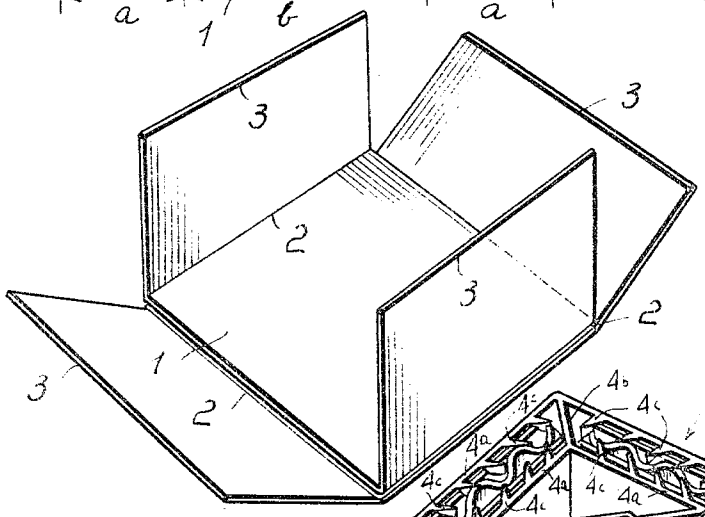


Fig. 2

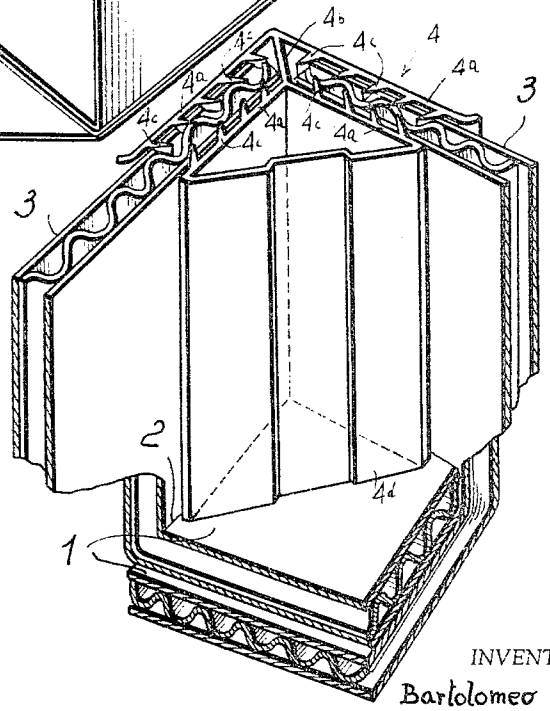


Fig. 3

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COMPOSABLE CONTAINER STRUCTURE CONSISTING OF SHEET-LIKE MATERIAL

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This invention relates to composable containers consisting of substantially stiff sheet like material, such as cardboard and similar materials, and more particularly a box for fruit, vegetables and the like, which may be composed from such a type of sheet material into a double bottom structure with easily connectable side walls for the formation and assembling of the box-shaped container by a single square member, applicable by pressure at the corner ends of the box.

Several types of composable containers are known, which may be made of one or more pieces of substantially stiff sheet material such as cardboard and similar materials, but such piece or pieces of sheet material are all obtained for the composition of such containers from shape- or dink-punching sheet material and providing fold lines delimiting different zones for the formation of the bottom and side walls of the composable container itself. Connections between the various parts for the assembling of such composable containers of known type, consisting of one or more shape- or dink-punched pieces, are usually made either by flaps which are laterally delimited by fold lines provided in the piece or pieces during the shape-punching operation for the formation of the piece or by auxiliary connecting means having sometimes also a complicated shape.

Because of the aforementioned shape- or dink-punching operation of the sheet material for the conformation of the shape punched piece or pieces for the assembling of such known composable containers, an evident waste of unutilizable cuttings occur with a consequent economical burden weighing on the manufacturing costs for such containers. Another economical inconvenience of such containers, besides the preparation of shape-punched pieces and cost involved in the equipment for such shape-punching operation, consists in the time needed for the assembling operations for obtaining the operative form of the composable container.

It is a main object of this invention to obviate all the above-outlined inconveniences by providing a practical possibility of erecting containers of this type from cardboard sheet material of the so-called undulated or corrugated type as it comes from the production line, that is to say, without requiring subsequent punching operations of the sheet or strip of cardboard produced on such manufacturing equipment. This possibility is sustained by the fact that the equipment for producing the so-called corrugated cardboard sheet or strip from which these composable containers are normally obtained may be provided with conveniently positionable means for operating on the cardboard sheet or strip under production score lines or lines whereat the thickness of the cardboard is reduced, which lines can also be used as fold lines of the cardboard and for cutting the cardboard strip perpendicular to its movement of advancement in the production line.

It is another object of this invention to make it possible to produce by such equipment one or more series of cardboard blanks or panels with two fold lines in such a way, that by arranging two of said cardboard pieces or blanks, crossed with respect to each other, and with their center zone overlapped and side zones or edges overturned about said fold lines upwardly, it is possible to obtain a double bottom composable container structure having side walls which are easily connectable at the corners of the container.

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Accordingly, the structure of the composable container, particularly for boxes to contain fruit, vegetables and the like, in accordance with this invention is characterized in that it is constituted of two pieces or blanks of substantially stiff sheet material such as preferably the so-called corrugated cardboard, each of them having a quadrangular shaped with right angles and fold lines parallel to, and equidistant from two parallel side edges of the blank said parallel fold lines of one of the blanks being provided at a distance which is respectively substantially equal to the length of the corresponding fold lines of the other blank, said blanks being disposed, crossed with respect to each other, with the portions comprised between the respective superposed fold lines and the side edges overturned upwardly round said respective fold lines, means in the form of an angular member with double walled wings being adapted to connect to each other the side edges of the two blanks by inserting the contiguous portions of the upwardly overturned edges of the two blanks between the said two walls of the wings of the angular member.

Further charactertistics and advantages will become more apparent from the following detailed description of a preferred but non-limiting embodiment of the composable container structure according to this invention when taken in conjunction with the accompanying drawing, in which:

FIG. 1 shows one of the blanks from which the container according to this invention is obtainable.

FIG. 2 shows a perspective view of said container in an intermediate assembling stage.

FIG. 3 shows, in an enlarged scale, one corner of the assembled container represented in a perspective view.

As mentioned above, the composable container according to this invention is obtained from cardboard sheet or strip material of the so-called corrugated cardboard type, consisting preferably of two flat sheets between which the corrugated sheet or layer is placed. This corrugated cardboard is produced in apparatuses provided with conveniently positionable tool means for providing on the cardboard web or tape under production the usual longitudinal score lines for selvage finishing purposes and cutting means to cut said cardboard web along a direction running perpendicular to its production forward motion in such a way as to build sheets or blanks of pre-determined dimensions.

These means for providing the said selvage finishing score lines may be used also for providing the fold lines of the invention on the cardboard web which will be used for the formation of the composable containers according to the invention from the sheets or blanks as they are cut off in the cardboard producing apparatus. In fact, by conveniently setting the aforesaid scoring and cutting means, of the corrugated cardboard producing apparatus, it is possible to manufacture one or more series of cardboard webs with longitudinal fold lines and to cut said webs perpendicular to said longitudinal fold lines in such a way as to build one or more series of blanks which are then used as obtained from the machine for erecting the composable container according to this invention.

Referring now to the embodiment shown in the figures of the accompanying drawing, FIG. 1 shows a blank **1** obtained from the aforesaid corrugated cardboard producing machine. On such blank **1** there are provided two longitudinal fold lines **2** at the same distance *a* from the corresponding longitudinal side edges **3**. Should it be desired to make containers with a square base, it would just suffice to prepare one single series of blanks, whilst in the case of containers with rectangular base, it would be necessary instead to prepare two series of blanks, one series with the fold lines **2** at the same distance *a* from the respective longitudinal side edges **3** and spaced from

each other a distance *b* substantially equal to the length *l* of longitudinal side edges 3 of the blank of the other series of blanks and vice versa.

The container under processing as shown in FIG. 2 is provided with a rectangular base and obtained by disposing, crossed with respect to each other, two of such blanks with respectively overlapped bases and overturning their side portions or edges upwardly about the fold lines 2. In such a manner, it is possible to assemble the composable container having a double bottom structure with crossed cardboard corrugations and with conveniently preset side walls allowing the mutual connection thereof for completing the assembling of the container. This connection is carried out according to this invention by a connection member, for example of extruded plastic material 4, which is quite simple and efficient, and has an angle shaped cross-section with wings provided with double walls 4*a* meeting at 90° angles and connection web 4*b* at the vertex of the square angle.

On the inner surfaces of the facing walls of the members 4*a* projections 4*c* converging like herringbone, towards the connection web 4*b* are provided between the walls of the angle members 4*a*. The projections 4*c* are in the form of continuous ribs extending parallel to the web member 4*b* and with an inclination of the projecting part of the ribs towards the web member. These continuous ribs will be hereinafter called "teeth." The inner walls of the wings 4*a* of the square angle shape of the connecting member 4 are connected to each other by a stiffening plate or part 4*d* like a longitudinal diaphragm (FIG. 3). Said longitudinal diaphragm part 4*d* destined to stiffen still further the composable container structure and allows to stack up even a considerable number of either empty or filled containers without danger that the container structure may vertically yield.

Such angular members are placed at the four corners of the container in such a way as to cause the vertical corner portions of the side walls or edges of the container to be forced between the walls 4*a* of said connecting angular member (FIG. 3).

The projections 4*c* provide a suitable lock on the connected parts due to their conformation and disposition.

As it will be noted from FIG. 3, the side walls 3 of the cardboard container have between their flat sheets 3*a* a corrugated sheet 3*b* the generatrix of the undulations of which extends perpendicularly to the bottom of the container and parallel to the web member 4*b*. In this way the teeth 4*c* penetrate through the flat sheets 3*a* and engage the corrugated sheet 3*b*.

In this way, a composable container structure is obtainable, which is particularly adapted as a box for containing fruit, vegetables and the like, being of rugged and resistant construction and involving a cost which is practically limited to the cardboard producing cost. In fact, so far as the cardboard is concerned there is no waste of material because any preparation step by shape-punching of the composable piece or pieces is hereby eliminated, and in connection with the container corners, pieces or sections of a member made by a continuous single extrusion process, for example of plastic material are used.

Such a connecting member may be provided in a length equal to, or longer than, the height of the container corner.

Evidently, the execution of the above-described container structure is only given by way of example, and it is obvious, therefore, that in the spirit of this invention several changes and detail modifications may be introduced in the course of the practical execution of such a container structure without departing from the scope of the invention as hereinabove described and claimed in the appended claims.

I claim:

1. In a cardboard container having two rectangular cardboard panels with superposed rectangular central portions forming the bottom of the container, said panels being arranged crosswise to each other, each of the cardboard panels having folded-up opposite end portions forming respective side walls of the cardboard container, in combination, a connecting structure for joining adjacent ends of the meeting side walls of the container one to another, comprising, for each of the four corners of the container: two spaced apart angle members one of which being the outer angle member and the other being the inner angle member, each of the angle members having wings meeting at 90° angles and forming a gap between the angle members receiving the meeting ends of the side walls of the cardboard container, a web member joining together at their vertices the two angle members, said web member bisecting the outer of said spaced apart angle members, the cardboard of said meeting ends including a sheet of corrugated cardboard therebetween having undulations the generatrix of which extending parallel to said web member, said wings having on their inner surfaces facing one another teeth in the form of continuous ribs extending parallel to said web member and projecting from said inner surface of the wings in a direction inclined towards said web member and embedded in said cardboard received in said gap and engaging said undulations to fix said cardboard within said gap, and a stiffening plate rigidly connecting the ends of the wings of said inner angular member.

2. In a cardboard container having two rectangular cardboard panels with superposed rectangular central portions forming the bottom of the container, said panels being arranged crosswise to each other, each of the cardboard panels having folded-up opposite end portions forming respective side walls of the cardboard container, in combination, a connecting structure for joining adjacent ends of the meeting side walls of the container one to another, comprising, for each of the four corners of the container: two spaced apart angle members one of which being the outer angle member and the other being the inner angle member, each of the angle members having wings meeting at 90° angles and forming a gap between the angle members receiving the meeting ends of the side walls of the cardboard container, a web member joining together at their vertices the two angle members, said web member bisecting the outer of said spaced apart angle members, the cardboard of said meeting ends including two external flat sheets of cardboard and an intermediate sheet of corrugated cardboard having undulations the generatrix of which extending parallel to said web member, said wings having on their inner surfaces facing one another teeth in the form of continuous ribs extending parallel to said web member and projecting from said inner surface of the wings in a direction inclined towards said web member and embedded in said cardboard received in said gap and engaging said undulations to fix said cardboard within said gap, and a stiffening plate rigidly connecting the ends of the wings of said inner angular member.

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