

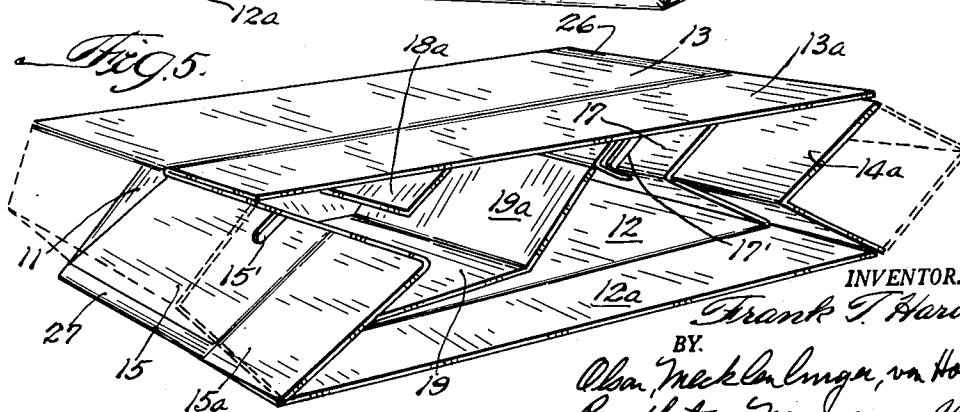
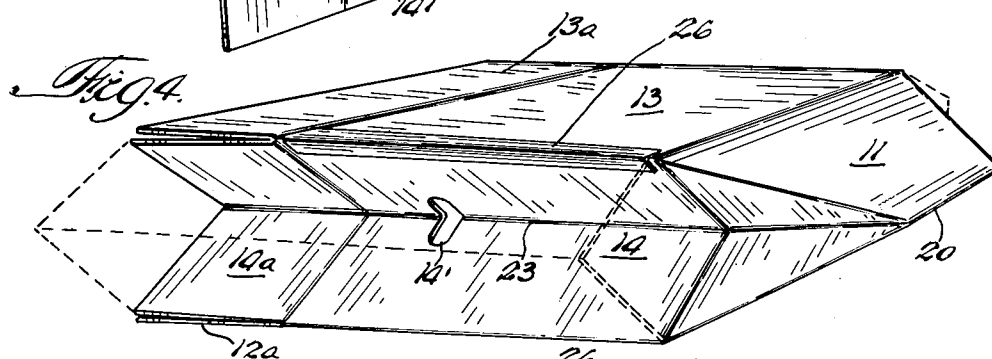
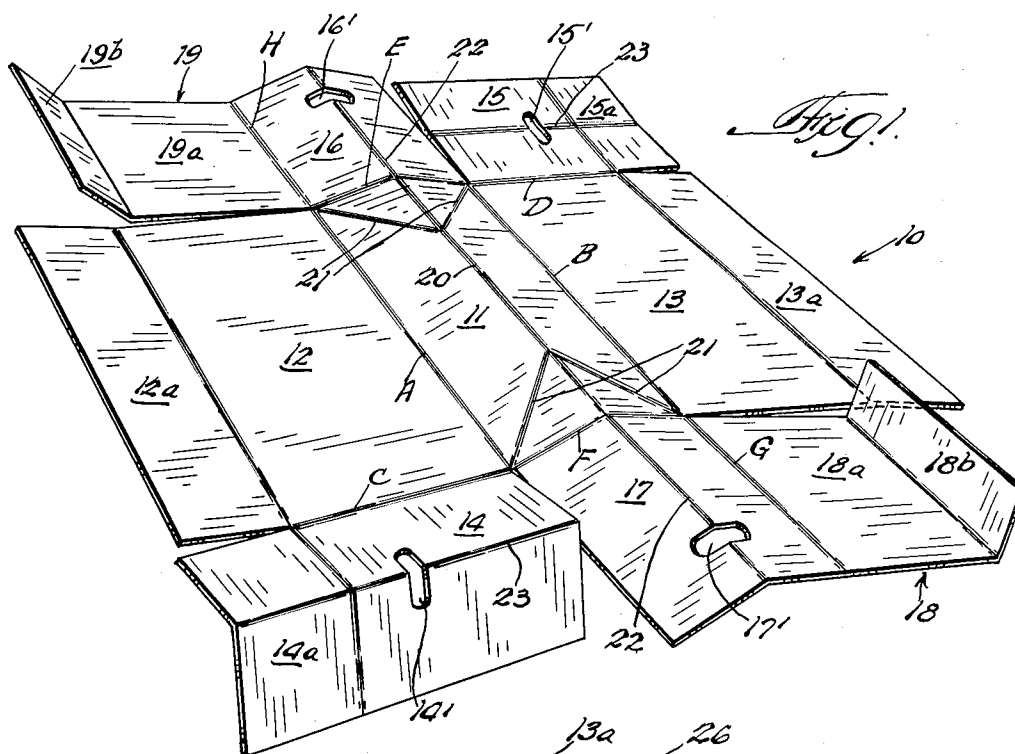
June 19, 1962

F. T. HARDON
COLLAPSIBLE CONTAINER

3,039,670

Filed May 25, 1960

2 Sheets-Sheet 1



INVENTOR.

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BY

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Oskar Neckelunge, von Holt,
Rondleten & Newman. *Vol. 15.*

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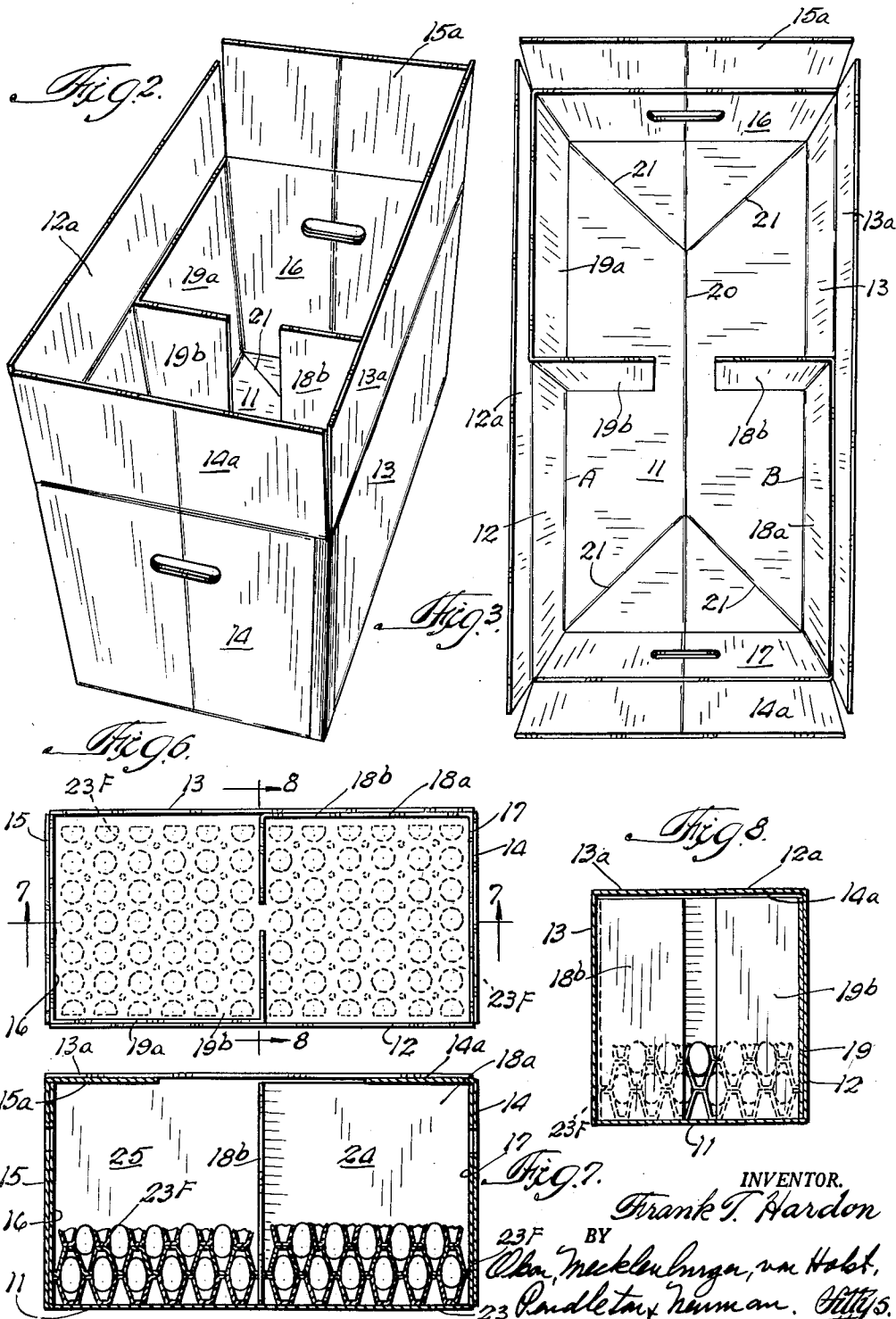
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3,039,670

COLLAPSIBLE CONTAINER

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This invention relates to a collapsible container or case suitable for shipping or storage purposes and, more particularly, to a container or case having a compartmented interior. As by way of example, reference will be made to cases or containers for the shipping and/or storage of quantities of fragile or perishable articles. One such article or commodity is eggs which are stored and transported in tremendous volume. The volume and characteristics of eggs are such that there has been developed what is termed a standard egg case or container.

The so-called standard egg case is standard only in the sense that it is of standard size comprising two like compartments, each adapted to hold fifteen dozen eggs together with the packing material required to hold the eggs in spaced relation in order to prevent breakage. Such standard egg cases have heretofore been made of wood and other rigid materials. They have also been made of container board of various constructions. However, quite aside from the material of which such cases have been constructed, they are open to one or more objections. Some are relatively heavy and not collapsible, others are expensive to produce. Some, while not heavy, are difficult to assemble and/or do not provide adequate strength to withstand the forces encountered in transporting the same with the contents packed therein. Other constructions which are fabricated of sheet material require several separate sheets to complete the container, or require special machinery not available in the conventional container fabricating plant. Again, in other constructions, a large amount of stitching is required and in certain instances the stitching must be done by hand. In certain constructions, where tape is used to hold the various sections together, the structure is such that it is not feasible to use the standard tape-applying equipment, such, for example, as the standard double taper.

Referring again to the packing of eggs in a standard egg case, several forms of packing material are utilized. One method of packing utilizes what is known in the trade as flats and fillers. United States Patents Nos. 2,168,317 and 2,216,193 disclose packing material of that type.

Another form of packing material used in the packing of eggs in a standard egg case is termed a filler-flat. United States Patent No. 1,956,955 is illustrative of that type of packing material.

Still another method of packing eggs utilizes separator sheets, each of which is adapted to support a plurality of 2 x 6 egg cartons. United States Patent No. 2,739,753 is illustrative of one form of that type of packing.

Thus reference has been made to three methods of packing eggs for storage and/or shipment in a so-called standard egg case. While the structure of the packing material differs one from the other in the three general packing methods to which reference has been made, all have one thing in common; that is to say, in each method there is provided a plurality of rectangular sheets, each of which is substantially the size of one of the two compartments of a standard egg case. These sheets are spaced apart vertically and are parallel to the bottom of the case or container. Thus, in the use of the filler and flats, the sheets are the "flats" which are spaced vertically by the "fillers." In the use of "filler-flats" the sheets are the filler-flats themselves, which comprise posts extending upwardly and downwardly from the plane of the sheet and, by contact

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with like posts of other sheets, provide the necessary spacing.

In the use of the so-called separator sheets the egg cartons which rest upon the separator sheet serve as a support for the next superposed separator sheet and thus provide for the vertical spacing of the separator sheets.

The general object of the invention is to provide a collapsible container having a bottom, sides, ends, top and cross partition to compartment the container into a plurality of vertical compartments and which shall comprise but a single blank of sheet material.

Another object of the invention is to provide a collapsible container of the type mentioned and which can be made rapidly and at relatively low cost.

A further object of the invention is to provide a collapsible container of the type mentioned which can be rapidly and easily converted from its collapsed or knocked-down condition to its set condition and also again easily collapsed when desired.

Again it is an object of the invention to provide a collapsible container of the type mentioned, which can be fabricated of fiberboard sheeting, such, for example, as double-faced corrugated sheeting, and in the fabrication of which it shall be possible to utilize machinery such as is generally available for the manufacture of fiberboard boxes of other types.

A more specific object of the invention is to provide a collapsible container of the type referred to in which the single blank can, during fabrication, be folded to collapsed generally flat condition and, whilst in this condition, the construction completed by the application of but two pieces of tape, one tape joining a vertical marginal end portion of the container to an adjacent vertical marginal portion of the side of the container, and the other tape joining a vertical marginal portion of the opposite end of the container with an adjacent vertical marginal portion of the opposite side of the container.

Still another object of the invention is to provide a construction in which the portion or portions comprising the cross partitions which compartmentize the container are braced against swinging movement longitudinally of the container by the rectangular sheets of the material used in packing fragile articles, such, for example, as eggs.

It is a further object of this invention to provide a collapsible carton which is of such design that a plurality of such cartons may be compactly packaged together when such cartons are in a collapsed state.

It is a still further object of this invention to provide a collapsible container which is capable of accommodating a wide variety of articles, is sturdy, easy to handle, and is capable of withstanding the rather rough treatment met with in use.

Further and additional objects will appear from the description, accompanying drawings and appended claims.

In accordance with one embodiment of this invention, a collapsible container is provided which is formed from a single blank of sheet material and which, when set up, has the general characteristics of a standard egg case or container. The container or case includes a bottom section, a pair of side sections foldably connected to opposite peripheral portions of the bottom section and end sections, parts of which are foldably connected to peripheral portions of said bottom section and the remaining parts of which are foldably connected to said side sections. The bottom, side and end sections of the container are adapted to form a chamber when said carton is in set-up condition. Integrally and foldably connected to one of the end section parts are partition sections which are adapted, when said container is set up, to effect compartmenting of the container chamber.

When used for the packing of eggs or the like there is disposed within each of the formed compartments the

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necessary packing material, such, for example, as flats and fillers, filler flats, separator sheets and filled egg cartons, which are supported on the separator sheets. However, quite aside from which type of packing material is used, the same comprises a plurality of rectangular sheets arranged in superimposed spaced relation and substantially parallel to the container bottom section. Each such sheet is of substantially the same size and configuration as the cross-sectional area of the compartment in which it is disposed, when the plane of cross section is taken substantially parallel to the bottom section. The sheets serve not only for separating the eggs but also are adapted to co-operate with one another to effect retention of the partition section in a fixed position within and cross-wise of the container chamber.

For a more complete understanding of the invention, reference should be made to the drawings, wherein:

FIGURE 1 is a perspective view of the single blank of sheet material from which the collapsible container is formed, the same being partly folded from its flat condition for illustrative purposes;

FIG. 2 is a perspective view of the collapsible container in a set-up condition with the top or cover flaps open to permit placement of the product and/or packing material into the container;

FIG. 3 is a top view of the container shown in FIG. 2;

FIG. 4 is a perspective view of the container taken from the underside of the container when it is in partially collapsed condition, in which the sides of the carton are spaced further apart than when fully collapsed to occupy the least space;

FIG. 5 is similar to FIG. 4, but viewed from the upper side of the container;

FIG. 6 is a top plan view on a reduced scale of the container as set up for use and partially filled with eggs and packing material and illustrating the manner in which the separator sheets of the packing material serve to brace the cross partition which compartmentizes the container, the top flaps being in open position;

FIG. 7 is a sectional view taken along line 7—7 of FIG. 6;

FIG. 8 is a sectional view taken along line 8—8 of FIG. 6;

Referring now to the drawings and, more particularly, FIG. 1, a single blank of sheet material 10 (originally flat but, as illustrated, partly folded), in this instance preferably double-faced corrugated fiberboard, is shown, and from which the collapsible container is adapted to be formed (see FIG. 2). The blank is provided with a plurality of score lines and fold lines which define a bottom section 11, of rectangular configuration, a pair of side sections 12 and 13 foldably connected along lines A and B to opposite peripheral portions of section 11; a pair of outer end sections 14 and 15 foldably connected along lines C and D, respectively, to peripheral portions of side sections 12 and 13, and a pair of inner end sections 16 and 17 foldably connected along fold lines E and F, respectively, to the peripheral portions of bottom section 11 intermediate fold lines A and B. It will be noted in FIGS. 2 and 7 that the side and end sections are adapted to assume substantially vertical positions and the bottom section a horizontal position when said carton is in a set-up condition.

Integral with and foldably connected along lines G and H to peripheral portions of inner end sections 16 and 17 are partition sections 18 and 19, which are adapted to compartment the interior of the set-up container. Each partition section is of like construction and includes a first segment 18a or 19a which is foldably connected to the inner end section periphery and a second segment 18b or 19b foldably connected to the first segment periphery and extending angularly therefrom into the container interior when the carton is in set-up condition. During set up of the container, first segment 18a or 19a is adapted to be disposed in parallel juxtaposed position relative to

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the respective side section. Partition sections 18 and 19 are of substantially the same height as side sections 12 and 13 and thus serve to reinforce the set-up container against crushing when several loaded containers are arranged in stacked relation.

Side sections 12 and 13 and outer end sections 14 and 15 are provided with flaps 12a, 13a, 14a, and 15a, respectively, which are adapted to co-operate with one another to effect closing of the upper side or top of the container subsequent to the latter being filled.

An important advantage possessed by the instant container is its ability to be collapsed for storage or shipping in bulk with other similar cartons and again easily set up for use when desired. The container is shown in its partially collapsed condition in FIGS. 4 and 5. It should be understood this condition is for illustrative purposes. When fully collapsed, the sides 12 and 13 will be pressed closer together to make a thinner package. To permit such collapsing, numerous score lines are formed in the various defined sections of the blank 10. The bottom section 11, for example, is provided with a centrally disposed longitudinally extending score line 20, which is parallel to fold lines A and B. Adjacent opposite ends of score line 20 are a pair of angularly extending score lines 21, which terminate at the corners of bottom section 11. By reason of score lines 20 and 21, bottom section 11 is able to fold outwardly, as seen in FIG. 4, when the carton is collapsed. Inner end sections 16 and 17 are provided with centrally disposed score lines 22 which are aligned with score line 20 of bottom section 11. Outer end sections 14 and 15 are also provided with score lines 23, which are also aligned with inner end section score lines 22 when the container is set up. Score lines 22 and 23 enable the inner and outer end sections to fold inwardly when the carton is collapsed (see FIGS. 4 and 5). The score lines 23 also permit the outer end sections to be folded outwardly, if desired, as shown in dotted lines in FIGS. 4 and 5, as will be explained in greater detail later.

The container may be readily manipulated by the packer from the collapsed condition to a set-up condition by placing the container so that the score line 20 of the outwardly protruding bottom section rests against a horizontal surface and then exerting a downward force on the upper edges of the side sections 12 and 13.

In FIGS. 6, 7, and 8 the container is shown as packed with eggs utilizing the conventional filler-flats of the type disclosed in said Patent No. 1,956,955. Other types of egg packing material may be used such, for example, as fillers and flats, of which said Patents Nos. 2,168,317 and 2,216,193 are illustrative.

Still another type of packing material which can be used is that in which separator sheets are provided for the support of individual egg cartons, usually of the 2 x 6 type. Patent No. 2,739,753 discloses one specific form of such separator sheet. This is by way of illustration and not by way of limitation.

By reference to the drawings of the instant application and the disclosures of the illustrative patents to which reference has been made, it will be seen that there are a number of different packing materials available and used in the packing of large quantities of eggs. The so-called standard container or shipping case is of such size as to accommodate 30 dozen eggs, 15 dozen per compartment when packed with the packing material of any of the types referred to above. The container or case of the instant invention is well adapted to serve as a standard egg case, and FIGS. 6, 7, and 8 may be considered to be of the proper size and structure to qualify as a standard egg case.

It will be seen that in each type of egg packing material mentioned there is a plurality of rectangular sheets substantially the size of one of the compartments positioned in each compartment. They are spaced apart vertically and are parallel to the bottom of the container,

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As will be seen shortly, they function not only as egg packing material but also as a part of the egg case or container assembly when the container is in set-up condition. In the flat-filler type of packing material, the flat is the sheet. In the filler-flat type of packing the filler-flat as a whole is the sheet, and in the separator-carton type of packing the separator member is the sheet. As a matter of convenience, such members and/or the like will all simply be termed "flats."

The segments 18b and 19b of partition sections 18 and 19 of the container co-operate with one another to form the container interior into two contiguous compartments 24 and 25. The flats 23F serve to retain partition section segments 18b and 19b in relatively fixed positions within the carton interior, even though they are not united.

While in FIGS. 6, 7, and 8 but a few flats are shown, in practice the entire container, from bottom to top, will be filled as shown in the patents cited.

While the improved container has heretofore been described relative to the packaging of eggs, it is to be understood, of course, that this is merely by way of illustration, as the carton has many other applications.

In order to retain the outer end sections 14 and 15 and the side sections 12 and 13 in folded relation with respect to one another, adhesively coated tapes 26 and 27 or other suitable means of securement may be utilized. It will be noted in FIG. 5 that such tapes or securing means are applied to two diagonally opposed corners of the container. These tapes can conveniently be applied while the carton is in collapsed condition, by means of a conventional tape-applying mechanism, such, for example, as a standard double taper.

Thus, an improved collapsible container has been provided which is formed of a single blank of sheet material and includes as part thereof partition sections which co-operate to effect compartmenting of the carton interior. The container is inexpensive to produce and avoids waste material. The container is sturdy and capable of accommodating a variety of objects. The container may be readily collapsed into a compact package suitable for storage or shipping in bulk with other empty cartons. The container may also be set up without difficulty.

Modified Collapsed Condition

The end sections 14, 14a, 15, 15a can, if desired, be positioned to extend away from the end marginal portions of the side sections instead of extending inwardly and between the same, as shown in full lines in the drawings. This arrangement is indicated by means of dotted lines in FIGS. 4 and 5. If the side sections be then pressed toward each other the assembly will be slightly thinner but will be of larger area. Such an arrangement is preferred by some. If shipped in this condition it will be convenient for the user, in order to set up the container for use, to place the score line 20 on a horizontal surface. The assembler can then reach into the opposite ends of the container, grip the inner end sections 16, 17 by placing the hand in the hand holes 16'-17' and press forcefully downward, which will effect set up of the container.

Further Remarks

While several embodiments of this invention have been shown above, it will be understood, of course, that the invention is not to be limited thereto, since modifications may be made, and it is contemplated, therefore, by the appended claims, to cover any such modifications as fall within the true spirit and scope of this invention.

I claim:

1. A collapsible container formed of a single blank of sheet material and comprising a bottom section; a pair of oppositely disposed side sections foldably connected to peripheral portions of said bottom section; outer end sections foldably connected to peripheral portions of said

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side sections, the line of fold between an outer end section and a side section being normal to the line of fold between said side section and said bottom section; oppositely disposed inner end sections foldably connected to peripheral portions of said bottom section and intermediate said side sections; and partition sections foldably connected to a peripheral portion of said inner end sections, each of said partition sections having a first segment foldably connected to said inner end section and adapted to be disposed in substantially parallel relation with one of said side sections when said container is in set-up condition, and a second segment foldably connected to a peripheral portion of said first segment and adapted to extend angularly from said first segment into the interior of said carton when in said set-up condition, the second segments of said partition sections co-operating with one another to effect compartmenting of said carton interior.

2. A collapsible container formed from a single blank of sheet material, comprising a substantially rectangularly shaped bottom section provided with an elongated score line; a pair of oppositely disposed side sections foldably connected to the longer side portions of said bottom section, the lines of fold connection between said side sections and said bottom section being substantially parallel to said bottom section elongated score line; outer end sections foldably connected to peripheral portions of said side sections and adapted to substantially span the distance between said side sections when said container is in set-up condition, each outer end section being provided with an elongated score line disposed in spaced, substantially parallel relation with respect to the line of fold connection between said outer end section and said side section and in alignment with the score line of said bottom section; inner end sections foldably connected to the shorter side portions of said bottom section and adapted to be in substantial coincident relation with said outer end sections when said container is in set-up condition, each of said inner end sections being provided with an elongated score line aligned with the score line in the adjacent outer end section; and partition sections foldably connected to said inner end sections, each partition section having a first segment foldably connected to said inner end section periphery and adapted to assume a parallel juxtaposed relation with a side section when said container is in a set-up condition, and a second segment foldably connected to said first segment and adapted to extend angularly from said first segment into the carton interior and effect compartmenting thereof; the width of said second segment not exceeding the length of the shorter side of said bottom section.

3. The structure set forth in claim 2, wherein the outer end section projects outwardly when the container is in collapsed condition.

4. The arrangement set forth in claim 2, wherein the outer end section projects inwardly when the container is in collapsed condition.

5. A sheet of container board formed for use in making a collapsible compartmented container and comprising a central rectangular section adapted to form the bottom of the container, said central section having a longitudinal fold line extending from end to end and disposed centrally thereof, rectangularly shaped first sections connected at each end of said central section along fold lines normal to the said central longitudinal fold line, and adapted to form inner ends of the container when folded upwardly with respect to the bottom section, each first section comprising a central fold line which is an extension of and is aligned with the central fold line of said central section, each first section also having a rectangular segment secured to a marginal portion thereof along a fold line which is parallel to said central fold line and aligned with a longitudinal side portion of the said central section, said rectangular segment having a part thereof foldable along a fold line

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which is parallel to the fold line which secures the segment to the corresponding first section, rectangular second sections connected along the longitudinal side portions of said central section along fold lines parallel to the longitudinal fold line of said central section, said second sections adapted to form the sides of a container when folded upwardly from the central section, each second section having a rectangular portion secured to one end thereof along a fold line aligned with the fold line on which the adjacent first section is foldable, said rectangular portions each being foldable along a fold line which is centrally disposed thereof and parallel with the fold line along which said portion is secured to the said second section, said rectangular portions overlying the rectangular segments of said first sections when said sheet is set up, and said central section being further provided with fold lines which converge inwardly from the outer end corners of the bottom section to a point of juncture with the central fold line of said central section.

6. The sheet structure set forth in claim 5 in which each of the side forming second sections and each of the rectangular portions foldably connected thereto are provided with foldable top panels along the outer margins thereof and foldable along fold lines in the case of the second sections which are parallel to the fold lines along which the second sections are secured to the central section and in the case of the rectangular portions along fold lines which are normal to the fold lines by which said rectangular portions are connected to the second sections, said panels which are foldably secured to the rectangular portions also being foldable along fold lines which are centrally disposed thereof and parallel to

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the fold line along which said portion is secured to the adjacent second section.

7. A collapsible container comprising a blank of sheet material folded to form a container having a bottom section, side sections, end sections and a pair of partition sections, each of said partition sections having an end portion the length of which is less than the width of said bottom section, said end portions being foldable inwardly toward each other to effect compartmenting of the container interior, and a plurality of removable flats disposed in spaced superimposed relation with each of the formed compartments of said container interior and in substantially parallel relation with respect to said bottom section, each of said flats being of substantially the same configuration as the cross-sectional area of the compartment in which it is disposed, said flats cooperating with one another and with said side sections, said end sections and the end portions of said partition sections to effect retention of said end portions in a substantially fixed position within said carton interior.

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