April 7, 1953 D. H. BLATT ET AL 2,634,042

CELLULAR CONTAINER FOR ARTICLE SHIPPING AND STORAGE

Filed April 12, 1949 3 Sheets-Sheet 1

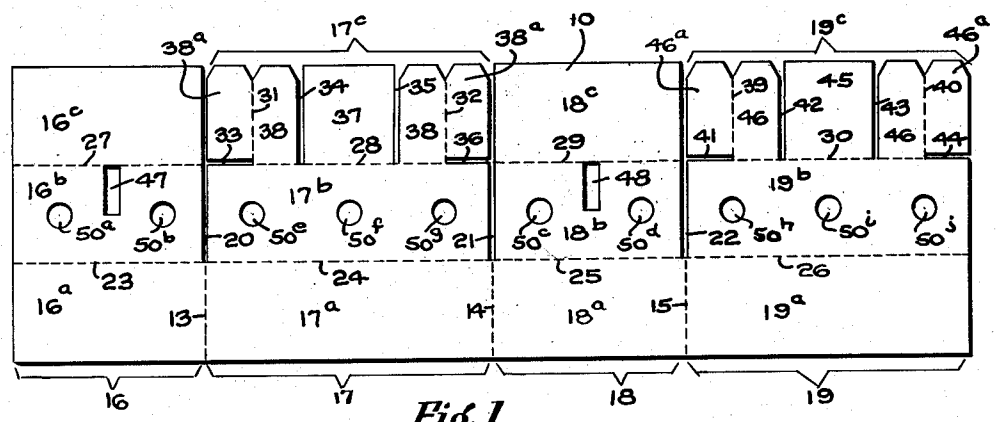


Fig. 1

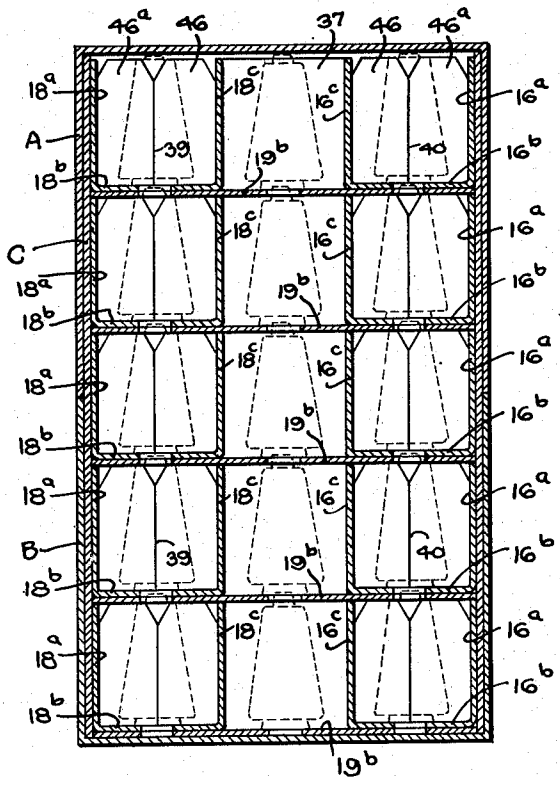


Fig 6

INVENTORS
David H. Blatt
Fredric R. Mann

BY Leon Edelson
Attorney

April 7, 1953 D. H. BLATT ET AL 2,634,042

CELLULAR CONTAINER FOR ARTICLE SHIPPING AND STORAGE

Filed April 12, 1949 3 Sheets-Sheet 2

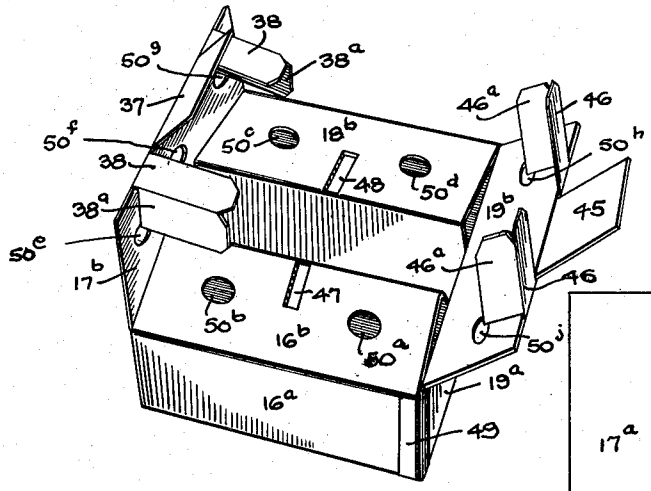


Fig. 2

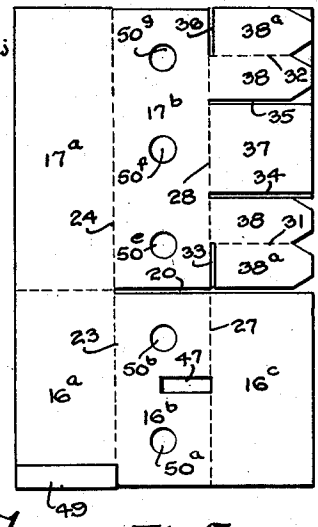


Fig. 7

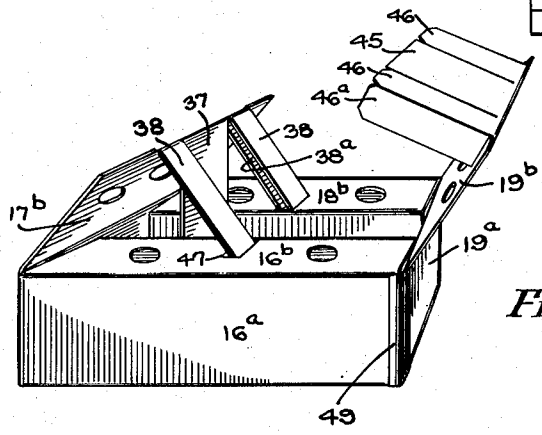


Fig 3

INVENTORS
David H. Blatt
Fredric R. Mann

BY Leon Edelson
Attorney

April 7, 1953 D. H. BLATT ET AL 2,634,042

CELLULAR CONTAINER FOR ARTICLE SHIPPING AND STORAGE

Filed April 12, 1949 3 Sheets-Sheet 3

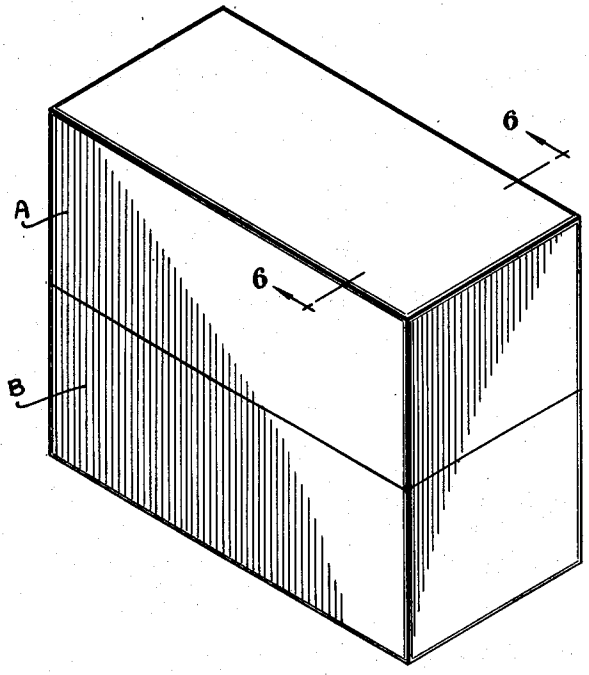


Fig. 5

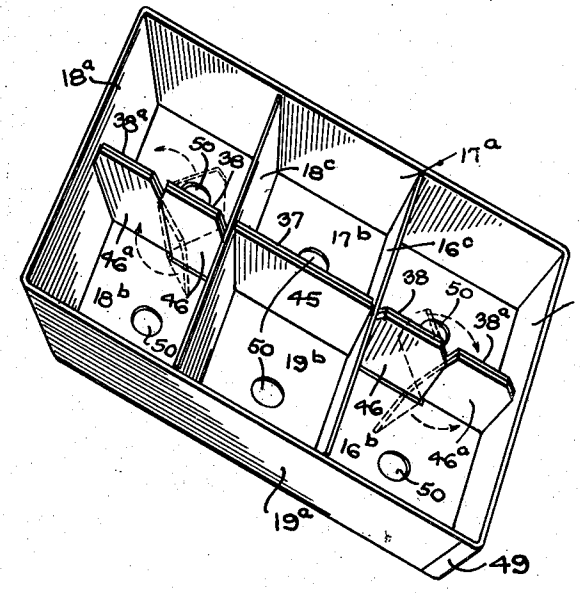


Fig. 4

INVENTORS
David H. Blatt
Fredric R. Mann
BY Leon Edelson
Attorney

Patented Apr. 7, 1953

2,634,042

UNITED STATES PATENT OFFICE

2,634,042

CELLULAR CONTAINER FOR ARTICLE SHIPPING AND STORAGE

David H. Blatt and Fredric R. Mann,
Philadelphia, Pa.

Application April 12, 1949, Serial No. 86,894

7 Claims. (Cl. 229—28)

1

This invention relates to shipping containers and more particularly to an improved construction of a cellular container designed to be readily and conveniently stacked within a main outer shell or container of conventional form, each cellular container being compartmentalized to receive a plurality of articles to be shipped and stored, such as cones of yarn or the like.

Among the principal objects of the present invention is to produce a cellular container from a single blank of corrugated paper board which is so scored and cut as to enable the blank to be readily expanded into the shape of a cellular carton with the several dividing partitions thereof so interlocked as to render the carton self-sustaining in shape and exceedingly strong and durable in use.

Other objects and advantages of the present invention will appear more fully hereinafter, it being understood that the invention consists substantially in the combination, construction and relative arrangement of parts all as will be described in detail hereinafter, as shown in the accompanying drawings and as finally pointed out in the appended claims.

In the accompanying drawings,

Figure 1 is a plan view of a blank of which the cellular carton of the present invention is formed;

Figure 2 is a perspective view showing the carton inverted and partially expanded into shape;

Figure 3 is a perspective view showing the inverted carton in an advanced stage of being expanded into its final shape;

Figure 4 is a perspective view of the cellular carton in its finally expanded shape;

Figure 5 is a perspective view of the outer shell or container in which a plurality of the cellular cartons of the present invention may be stacked;

Figure 6 is a vertical sectional view of the shipping and storage unit consisting of the outer container and its internally stacked cellular cartons as taken on the line 6—6 of Figure 5;

Figure 7 is a plan view showing the blank of Figure 1 folded and taped into flat form convenient for shipping and storage thereof.

Referring now to the drawings and particularly to Figure 1 thereof, it will be observed that the cellular carton of the present invention is formed of a single blank 10 of suitable sheet material, such as corrugated paper board or the like which is longitudinally and transversely scored along the dotted lines, as shown, to provide a plurality of relatively foldable sections, the blank being additionally cut or slit along predetermined lines, as shown, to further facilitate relative folding and

2

interlocking of the self-sustaining carton 11 of the form shown in Figure 4 having a plurality of separate article receiving compartments 12, each of these compartments being closed on all but the top side thereof. The particular form of cellular carton as produced from the blank 10 of Figure 1 and as shown in Figure 4 is provided with six of the open topped cells or compartments 12 arranged in two rows of three each with each compartment being of generally square shape. It will be understood, however, that the carton and the several cells or compartments thereof may be varied in their general dimension and shape by suitable modification of the carton forming blank 10, all without departing from the principles of the present invention as will now be described in detail.

The blank 10 is transversely scored along the parallel score lines 13, 14 and 15 to provide it with four relatively foldable main panel sections respectively designated 16, 17, 18 and 19. The panel sections 16, 17, 18 and 19 are partially separated by transversely extending cuts or slits 20, 21 and 22 which are respectively in straight line continuation of the transverse score lines 13, 14 and 15.

The several main panel sections 16, 17, 18 and 19 are respectively scored along the lines 23, 24, 25 and 26 and also along the lines 27, 28, 29 and 30, in consequence of which each of said sections is provided with a plurality of relatively foldable portions. Thus, the main section 16 includes the relatively foldable portions 16^a, 16^b and 16^c; section 17 includes the relatively foldable portions 17^a, 17^b and 17^c; the section 18 includes the relatively foldable portions 18^a, 18^b and 18^c; while the section 19 includes relatively foldable portions 19^a, 19^b and 19^c.

The portion 17^c is transversely scored along the lines 31 and 32 and slit as at 33, 34, 35 and 36 to thereby provide said section 17 with a central flap 37 disposed between a pair of oppositely disposed flaps 38—38. These latter flaps 38—38 are respectively provided with wing elements 38^a—38^a which are foldable about the score lines 31 and 32 flatwise against the flaps 38—38.

The portion 19^c of the main section 19 is likewise scored along the lines 39 and 40 and cut along the lines 41, 42, 43 and 44 to provide it with a central flap 45 disposed between a pair of flaps 46—46, each of which latter is provided with a foldable wing element 46^a adapted to be folded flatwise against its supporting flap 46.

The intermediate portion 16^b of the section 16 of the blank is provided with a rectangular slot 47,

while the intermediate portion 18b of the blank section 18 is similarly provided with a rectangular slot 48.

To form the cellular carton of the blank shown in Figure 1, the opposite ends of the blank are secured together by a tape 49 equal in length to the uniform depth of the portions 16a, 17a, 18a and 19a of the blank. The tape thus secures together only the free ends of the portions 16a and 19a, as best shown in Figures 2, 3 and 7. For convenience in the shipment and storage of the carton-forming blank it is doubled upon itself about the central fold line 14 and its opposite ends taped, as at 49, to provide a substantially flat, compact unit which may be conveniently shipped and stored in any desired quantities.

To expand the blank into the form of a self-sustaining carton, it is initially opened into quadrangular form with the main sections 17 and 19 disposed in parallel relation and the sections 16 and 18 also disposed in parallel relation but at right angles respectively to the sections 17 and 19. In such initial condition of the blank, the sections 16 and 18 are respectively disposed in position to form the opposite end walls of the carton, while the sections 17 and 19 are respectively disposed in position to form the opposite side walls thereof.

The portions 16b and 18b of the end wall sections are then turned inwardly relatively to the opposite end walls 16a and 18a of the carton to assume a substantially horizontal coplanar relation, following which the portions 16c and 18c are respectively folded about the score lines 27 and 29 to assume vertical positions parallel to each other and to the end wall portions 16a and 18a, the spacing between the inturned portions 16c and 18c and the end walls 16a and 18a of the carton being substantially equal. In this latter respect, it will be noted that in order to insure such uniform spacing between the parallel portions 16a, 16c, 18c and 18a of the carton, the portions 16b and 18b are each of a depth approximately equal to one-third the length of the carton side walls 17a and 19a.

The next step in setting up the carton is to fold the portions 17b and 19b of the side wall sections 17 and 19 inwardly into horizontally extending coplanar relation so as to present them in overlying relation with respect to the horizontally disposed portions 16b and 18b. At the same time, the central flaps 37 and 45 of the sections 17 and 19 are respectively projected into the space formed between the vertically disposed parallel portions 16c and 18c, simultaneously as the doubled flaps on either side of the flaps 37 and 45 are respectively projected into and through the slots 47 and 48 of the horizontally disposed coplanar portions 16b and 18b. It will be noted that these latter slots 47 and 48 are each of a length equal to the width of the doubled flaps 38—38a and 46—46a and also that each of these slots 47 and 48 is of a width sufficient to permit the free projection therethrough of a pair of the doubled flaps. Thus, the slot 47 is of a length and width sufficient to permit the free projection therethrough of that pair of the doubled over flaps which respectively depend from the corresponding outer ends of the sections 17b and 19b, while the slot 48 is of a length and width sufficient to permit the free projection therethrough of that pair of the doubled over flaps which respectively depend from the opposite corresponding ends of the sections 17b and 19b.

In setting up the carton, the preferable procedure is to overlap first one and then the other of the portions 17b and 19b with respect to the slotted portions 16b and 18b, such operations being best illustrated in Figures 2 and 3. Thus, as shown in these figures the portion 17b with its depending flaps 37 and 38—38 is first interengaged with the portions 16b and 18b of the carton, after which the doubled over flaps 38—38 are respectively projected through the slots 47 and 48, while the central flap 37 is projected into the space formed between the vertically disposed parallel portions 16c and 18c. Following the projection of the doubled over flaps 38—38 through the slots 47—48 so as to present the portion 17b of the carton in closely overlying relation with respect to the horizontally disposed portions 16b and 18b of the carton, the opposite portion 19b with its depending flaps 45 and 46—46 is similarly disposed in relation to the slotted portions 16b and 18b of the carton, in which latter case the doubled over flaps 46—46 are also respectively projected into and through the slots 47 and 48, while the central flap 45 depending from the portion 19b is snugly received in the space formed between the vertically disposed parallel portions 16c and 18c.

It will be understood, of course, that the horizontally disposed portions 16b and 18b and their overlying portions 17b and 19b constitute the bottom wall of the cellular carton, while the vertically extending parallel portions 16c and 18c constitute transversely extending partition walls which divide the container into three separate compartments, these partitions extending in parallel relation to the end walls of the carton (see Figure 4). The flaps 45 and 37 each projecting inwardly into the space formed between the partition walls 16c and 18c are in flatwise engagement with one another to conjointly form a central separator for the intermediate compartment of the carton to thereby divide the said compartment into two article-receiving cells of substantially square outline.

Similarly, the flap 38 with its freely extending portion 38a and the flap 46 with its freely extending portion 46a conjointly constitute a separator for the compartment immediately adjoining the end wall 16a of the carton, while the corresponding flaps at the opposite end of the carton correspondingly form a separator for the end compartment which immediately adjoins the end wall 18a of the carton, all as best shown in Figure 4. It will be noted that the cell-forming flaps 37—45, 38—46 and 38—46 are aligned longitudinally of the carton to conjointly form with the transverse partition members 16c and 18c a total of six article-receiving cells.

A most important feature of the present invention is the arrangement for interlocking the bottom wall portions 17b and 19b to the longitudinally spaced transversely extending bottom wall portions 16b and 18b of the carton, to thereby provide an exceedingly rigid cellular carton which is self-sustaining in form and which is adapted to support a relatively heavy load of articles respectively disposed in the several cells of the carton. In respect to this interlocking feature, it will be noted that when the doubled over flap elements 38—38a and 46—46a are projected through the slots 47 and 48 in the bottom wall portions 16b and 18b as above described, the wing elements 38a and 46a thereof are adapted to be swung into their outwardly extending positions as shown in full line in Figure 4, in which position the bottom ends of these wing elements

rest upon the uncut or solid surfaces of the bottom wall portions 16b and 18b of the carton and so secure the outermost bottom panels 17b and 19b flatwise against the said inner bottom wall portions 16b and 18b.

Should it be desired to collapse the carton so that it may be folded into its flattened condition, as shown in Figure 7, it is merely necessary to reversely swing the wing elements 38a and 46a flatwise against their respective supporting flaps 38 and 46, whereupon the doubled over flaps are adapted to be projected outwardly through the slots 47 and 48 and so break the interlock between the overlying bottom wall portions of the carton.

The cellular carton of the present invention is particularly adapted as an inner-pack element of a shipping container unit such as is shown in Figures 5 and 6, which unit includes a pair of upper and lower box sections A and B respectively adapted to be telescopically fitted over the opposite ends of an inner piece or liner fold made up in the form of a tube. The cellular cartons of the present invention are adapted to be stacked within the shipping unit formed of the members A, B and C, in the particular illustration shown a total of 15 such cartons being encased within the shipping unit, the cartons being therein arranged in five tiers of three cartons each. Of course, the carton dimensions may be varied as desired to provide for any desired stacking arrangement thereof within an outer shipping casing.

The cellular carton of the present invention is especially convenient for the packing, shipping and storing of yarn which is conventionally wound in truncated conical form upon a suitable core to form what is known in the trade as a cone of yarn, such as cones being shown in dotted line representation in Figure 6. The several cells of the expanded carton of the present invention are each of a dimensional size to receive an individual cone therein.

In some cases it may be desirable to make provision for projection of the upper end of each cone core into the enlarged bottom end of the next adjoining cone core in each vertical line of the cones, thereby limiting lateral movement or tilting of the cones in the carton cells in which they are respectively accommodated. To this end, the bottom walls of the several carton cells may each be provided with a central aperture 50 through which may be projected the reduced upper tip of the core of that cone which is disposed in a cell immediately below the particular aperture.

The apertures 50 thus formed in the bottom wall of each cell of a given carton may be provided for by initially forming the blank 10 (see Figure 1) with a series of cutout holes spaced as shown in the several sections 16b, 17b, 18b and 19b of the blank. The section 16b is provided with a pair of apertures 50a and 50b, while the section 18b is similarly provided with a pair of apertures 50c and 50d. The section 17b is in turn provided with three such apertures 50e, 50f and 50g, while the section 19b is also provided with three apertures 50h, 50i and 50j. When the carton is expanded into shape, as shown in Figure 4, the apertures 50b and 50e register with one another to form a through-hole for one end cell of the carton, while the apertures 50a and 50j similarly register to provide a through-hole for the adjoining end cell of the carton. Similarly, the apertures 50g and 50c register to form a through-hole for the cell at the opposite end of the carton, while the apertures 50d and 50h register to form a through-hole for the adjoining end cell. The apertures 50f and 50i in themselves respectively form the central holes of the intermediate pair of the carton cells.

It will be understood, of course, that the present invention is susceptible of various changes and modifications which may be made from time to time without departing from the general principles or real spirit thereof, and it is accordingly intended to claim the same broadly, as well as specifically, as indicated by the appended claims.

What is claimed as new and useful is:

1. In a structure of the character described, a single blank of sheet material cut, scored and folded to form an open-topped cellular shipping and storage container, said blank being characterized in that it includes a plurality of relatively foldable adjoining sections respectively constituting the perimetric side walls of the carton, a plurality of sections respectively attached to said side-wall-forming sections and adapted to be folded relatively thereto to form the bottom wall of the carton, one pair of said last-mentioned sections being arranged for coplanar disposition lengthwise along opposite sides of the carton and another pair thereof being arranged for coplanar disposition widthwise across opposite ends of the carton and in overlying relation with respect to said first-mentioned pair of the bottom-wall-forming sections, said widthwise-disposed pair of the bottom-wall-forming sections being spaced from each other to provide a space therebetween in the central region of the carton, and a plurality of sections respectively attached to said bottom-wall-forming sections and adapted to be folded at right angles thereto to provide vertically disposed intersecting partition walls within the interior of the carton, one pair of said partition-wall-forming sections being respectively attached to said widthwise disposed pair of bottom-wall-forming sections for disposition in spaced, parallel relation to each other and the end walls of the carton, the partition-wall-forming sections attached to the lengthwise extending bottom-wall-forming sections each including a central flap element positionable vertically substantially in the longitudinally extending median plane of the carton and a pair of foldable flap elements arranged to either side of said central flap element and extendable in unfolded condition into coplanar relation with respect to said central flap element, said foldable flap elements being each foldable upon itself for projection into and through a slot formed in a widthwise disposed bottom wall section of the carton preliminarily to being unfolded internally of the carton to positively interlock together the overlying bottom wall sections of the carton.

2. In a structure of the character described, a single blank of sheet material cut, scored and folded to form a shipping and storage carton having a plurality of article-receiving compartments, said blank being characterized in that it includes a plurality of relatively foldable adjoining sections respectively constituting the perimetric side walls of said carton, a plurality of sections respectively attached to said side-wall-forming sections and foldable at right angles relatively to the latter to form the bottom wall of said carton, said bottom-forming sections being paired for disposition in coplanar relation when folded relatively to the side-wall-forming sections, one pair of said bottom-forming sections being arranged for respective disposition length-

wise along opposite sides of the carton and the other pair thereof being arranged for respective disposition widthwise across opposite ends of the carton and in overlying relation with respect to said first-mentioned pair, a plurality of partition sections attached to each of one pair of said bottom-forming sections and foldable at right angles to the latter to provide vertically disposed longitudinally extending partitions within the interior of the carton, and a single partition section attached to each of the second pair of said bottom-forming sections and foldable at right angles thereto to provide vertically disposed partitions within the interior of the carton extending transversely and in intersecting relation to the longitudinally extending partition, certain of the sections forming the longitudinal partitions aforesaid being each provided with a wing portion foldable flatwise against its supporting section to form a doubled part of a width less than that of an adjoining widthwise extending bottom-forming section, each of the latter sections being provided with a transverse opening therein of a width sufficient to permit the projection therethrough of one of said doubled parts.

3. In a structure as defined in claim 2 wherein said second-mentioned pair of widthwise extending bottom-wall-forming sections being spaced apart lengthwise of the carton.

4. In a structure as defined in claim 2 wherein the longitudinally extending partition-forming sections are adapted for disposition in juxtaposed, flatwise engagement with each other to form a longitudinally extending double-thickness partition wall spaced centrally between and paralleling the longitudinally extending side walls of the carton.

5. In a structure of the character described, a single blank of sheet material cut, scored and folded to form an open-topped cellular shipping and storage container, said blank being characterized in that it includes a plurality of relatively foldable adjoining sections respectively constituting the perimetric side walls of the carton, a plurality of sections respectively attached to said side-wall-forming sections and adapted to be folded relatively thereto to form the bottom wall of the carton, one pair of said last-mentioned sections being arranged for coplanar disposition lengthwise along opposite sides of the carton and another pair thereof being arranged for coplanar disposition widthwise across opposite ends of the carton and in overlying relation to said first-mentioned pair of the bottom-wall-forming sections, and a plurality of intersecting partition-forming sections respectively attached to the bottom-forming sections, certain of said partition-forming sections being flatly foldable each upon itself for projection thereof through one pair of said bottom-forming sections, said certain partition-forming sections acting to positively interlock said bottom-forming sections when unfolded after such projection.

6. In a structure of the character described, a single blank of sheet material cut, scored and folded to form an open-topped cellular shipping and storage container, said blank being characterized in that it includes a plurality of relatively foldable adjoining sections respectively constituting the perimetric side walls of the carton, a plurality of sections respectively attached to said side-wall-forming sections and adapted to be folded relatively thereto to form the bottom wall of the carton, one pair of said last-mentioned sections being arranged for coplanar disposition lengthwise along opposite sides of the carton and another pair thereof being arranged for coplanar disposition widthwise across opposite ends of the carton and in overlying relation with respect to said first-mentioned pair of the bottom-wall-forming sections, and a plurality of intersecting partition-forming sections respectively attached to the bottom-forming sections, said widthwise-disposed pair of the bottom-wall-forming sections being spaced from each other to provide a space therebetween in the central region of the carton, and a plurality of intersecting partition-forming sections respectively attached to the bottom-forming sections, certain of the partition-forming sections being flatly foldable each upon itself for projection thereof through said widthwise extending bottom-forming sections, said certain partition-forming sections acting to positively interlock said bottom-forming sections when unfolded after such projection.

7. In a structure of the character described, a single blank of sheet material cut, scored and folded to form an open-topped cellular shipping and storage container, said blank being characterized in that it includes a plurality of relatively foldable adjoining sections respectively constituting the perimetric side walls of the carton, a plurality of sections respectively attached to said side-wall-forming sections and adapted to be folded relatively thereto to form the bottom wall of the carton, one pair of said last-mentioned sections being arranged for coplanar disposition lengthwise along opposite sides of the carton and another pair thereof being arranged for coplanar disposition widthwise across opposite ends of the carton and in overlying relation with respect to said first-mentioned pair of the bottom-wall-forming sections, said widthwise-disposed pair of the bottom-wall-forming sections being spaced from each other to provide a space therebetween in the central region of the carton, and a plurality of sections respectively attached to said bottom-wall-forming sections and adapted to be folded at right angles thereto to provide vertically disposed intersecting partition walls within the interior of the carton, one pair of said partition-wall-forming sections being respectively attached to said widthwise disposed pair of bottom-wall-forming sections for disposition in spaced, parallel relation to each other and the end walls of the carton, and a second pair of said partition-wall-forming sections each including foldable flap elements adapted to be folded upon themselves for projection through slots formed in the widthwise disposed pair of bottom-wall-forming sections of the carton and then unfolded internally of the carton to positively interlock each widthwise-disposed bottom-wall section with the lengthwise-disposed coplanar bottom-wall sections aforesaid.

DAVID H. BLATT.
FREDRIC R. MANN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
64,653	Fitzki	May 14, 1867
1,881,900	Oman et al.	Oct. 11, 1932
2,006,725	Unsinger	July 2, 1935
2,450,941	Crane	Oct. 12, 1948