May 23, 1961 W. H. FREDRICK 2,985,332

COLLAPSIBLE CONTAINER

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FIG_1

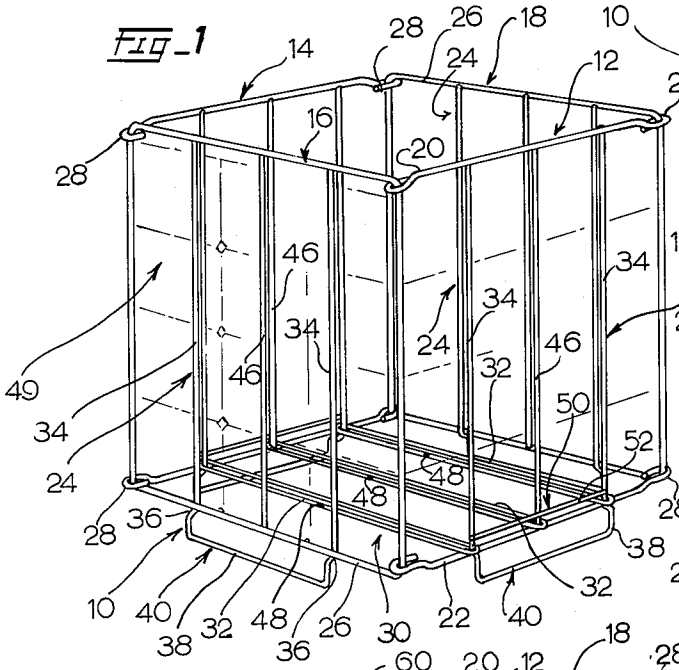


FIG_2

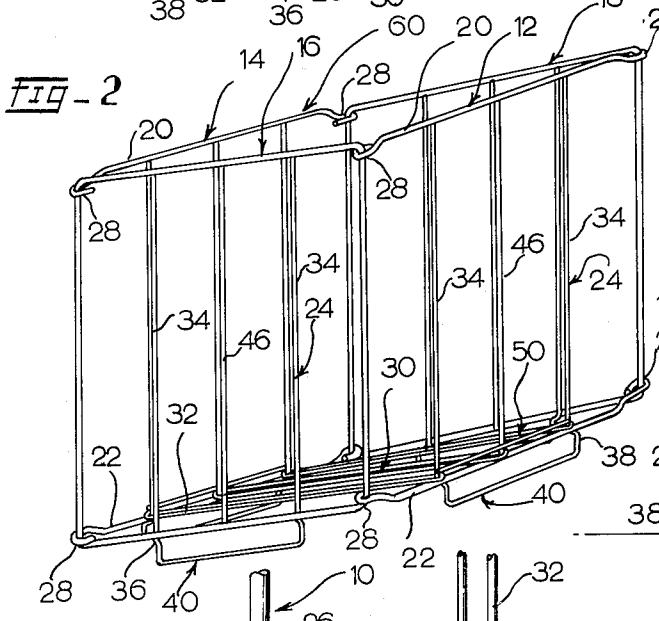


FIG_3

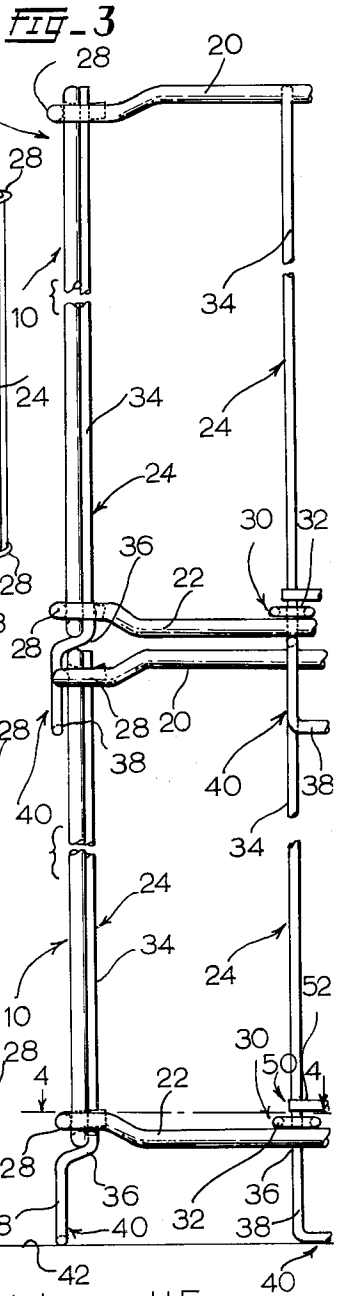
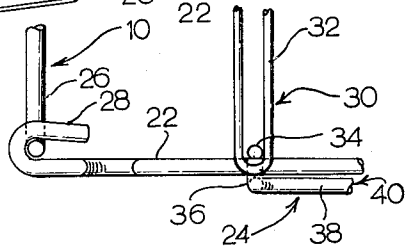


FIG_4



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COLLAPSIBLE CONTAINER

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FIG-5

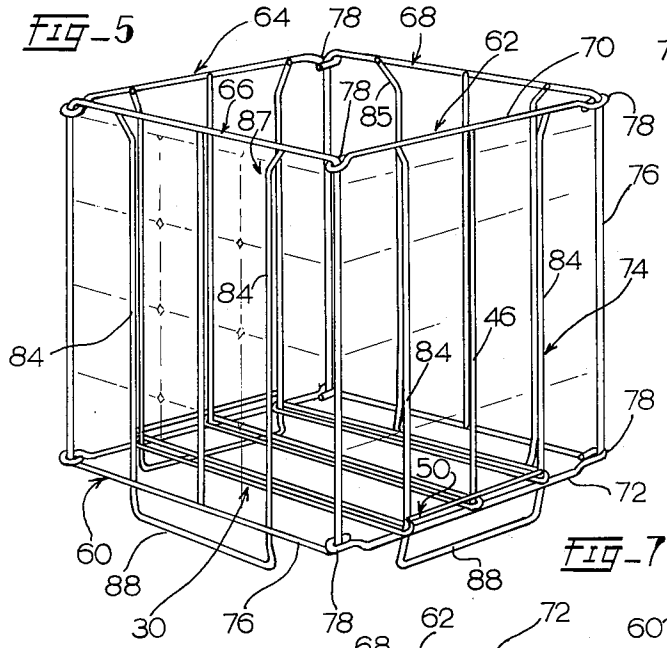


FIG-7

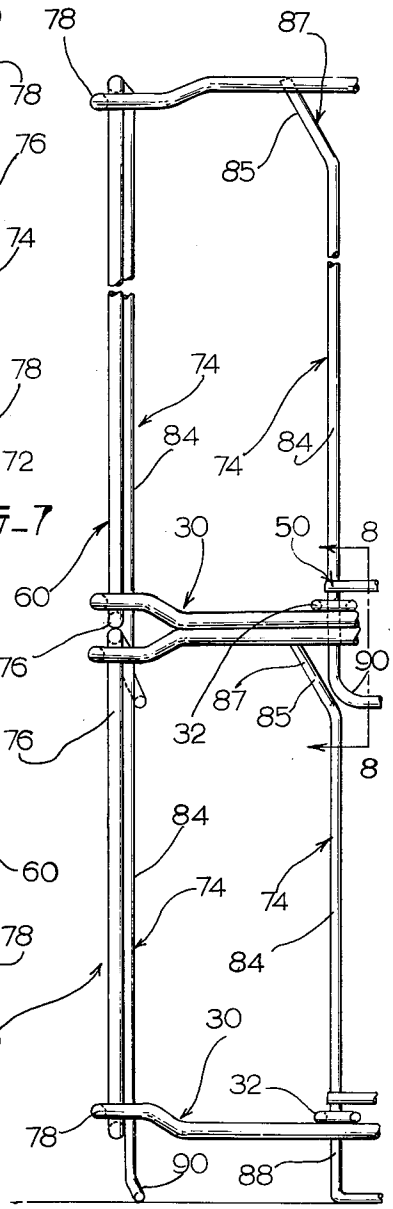


FIG-6

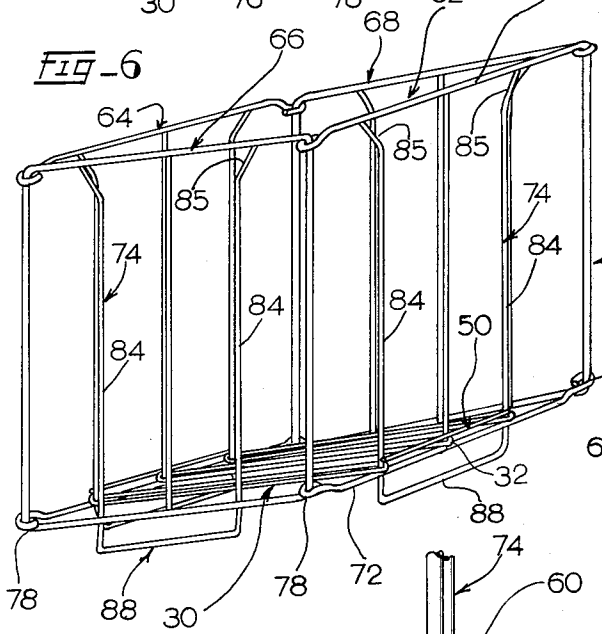
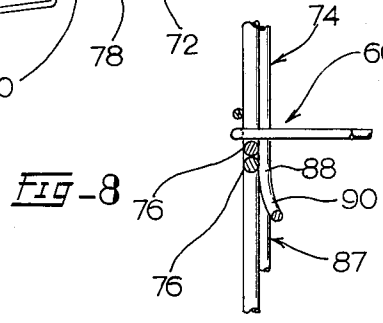


FIG-8



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COLLAPSIBLE CONTAINER

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3 Claims. (Cl. 220—6)

This invention relates to a collapsible container adapted to be utilized in shipping and storing various types of articles.

In describing the construction and mode of utilization of the collapsible container of my invention, particular reference will be made to the transportation, storage, and display of eggs in cartons, but it is, of course, readily understood by those skilled in the art that the teachings of the invention may be readily applied to many other types of comestibles and to many other types of articles such as packaged merchandise and the like, and it is therefore not intended that the aforesaid teachings be limited specifically to the packing, storing, shipping, and display of comestible goods alone.

The conventional practice followed in the packaging, transporting, storage, and display of various types of comestibles involves the utilization of wood and corrugated kraft paper containers which are, of course, subject to rapid deterioration and which involve a considerable storage problem, both on the part of the original packer and on the part of the retail merchant ultimately receiving the comestible goods packed in such containers. Frequently the merchant is expected to pay a deposit on the containers and must store the bulky containers in his storeroom, thus consuming a great deal of space which is sorely needed for the storage of merchandise.

This problem is particularly prevalent in the shipping, storage and packing of eggs since eggs are usually shipped in paper cartons packed in wooden containers and must be removed from the containers in order that they may be price marked and placed on the shelves on the display gondolas customarily utilized to display such merchandise. After the wooden or paperboard containers have been emptied, they must be stored in the storeroom of the retail merchant until such time as the employee of the packer picks up the containers to return them to the packing plant.

Another undesirable aspect of conventional wooden and paper containers utilized for shipping comestibles is the fact that they are frequently re-used even though they may be in an unsanitary or a structurally defective condition with resultant contamination or damage to the comestible articles shipped therein. This is particularly true in the case of eggs where the shipping cartons or containers should be of a uniform standard of sturdiness in order that breakage so characteristic of the shipping, storage, and display of eggs may be eliminated.

It is, therefore, an object of my invention to provide a collapsible container adapted to be utilized in packing, shipping, storing and displaying various types of comestible goods, said container being fabricated from plated wire or other metallic shapes and thus being characterized by an extremely long life and resistance to contamination and structural impairment. Thus, the containers of the invention can be readily sterilized and cleaned if the need therefor should arise and will resist the hard usage to which they are inevitably subjected during the packing, transporting and unloading processes.

Another object of the invention is the provision of a collapsible container of the aforementioned character which can, because of the fact that it can be folded into a relatively small compass, be easily stored in a relatively small space by both the packer and the merchant, thus eliminating the storage problems previously encountered in the use of conventional containers.

A further object of my invention is the provision of a collapsible container of the aforementioned character wherein the side walls of the container are foldable toward one another simultaneously with the bottom portion of the container and thus the container can be readily collapsed by a single movement into folded position. Of course, an associated object of the invention is the return of the container to its open, extended position by a correspondingly simple, single movement.

Of course, such containers must be stacked one upon the other during shipment and where conventional containers are utilized it frequently happens that displacement of one container stacked upon another occurs, the container falling to the floor and the contents thereof being damaged.

A further object of my invention is the provision of a shipping container of the aforementioned character wherein the side walls of the container have integrally formed thereupon interlocking means adapted to engage the upper extremity of the container disposed therebelow to prevent misalignment of the superimposed container with respect to the container disposed therebelow and to maintain said containers against displacement from operative relationship with each other.

An associated object of the invention is the provision of the aforesaid interlocking means on the side walls of the container which are adapted to space the bottom wall of the container above the surface of a floor or other supporting area upon which the container is disposed, thus preventing contamination of the contents of the container by moisture, dust, or other contaminants.

Other objects and advantages of the invention will be apparent from the following specification and the accompanying drawings which are for the purpose of illustration only and in which:

Fig. 1 is a perspective view showing a container constructed in accordance with the teachings of my invention;

Fig. 2 is a perspective view showing the container of Fig. 1 in collapsed condition;

Fig. 3 is an enlarged, fragmentary view showing the relationship between superimposed containers;

Fig. 4 is an enlarged, fragmentary, sectional view taken on the broken line 4—4 of Fig. 3;

Fig. 5 is a perspective view of an alternative embodiment of the container of my invention;

Fig. 6 is a perspective view showing the alternative embodiment in collapsed condition;

Fig. 7 is an enlarged, fragmentary view showing the relationship between superimposed containers; and

Fig. 8 is an enlarged, fragmentary, sectional view showing the relationship between the interlocking means of a superimposed container and the container disposed therebelow.

Referring to the drawings, and particularly to Figs. 1–2 thereof, I show a collapsible container 10 constructed in accordance with the teachings of my invention and being of substantially square configuration in plan. In the present embodiment of the invention, the entire container is fabricated from drawn wire shapes appropriately formed by conventional forming means and welded or otherwise secured in operative relationship. However, it is readily apparent to those skilled in the art, that, while the utilization of drawn wire as the primary structural material is desirable, in some applications the utilization of a material other than drawn wire may be indicated and it is not intended that the teachings of the invention be limited by the particular material utilized in fabricating the collapsible container 10.

The container 10 includes side walls 12, 14, 16, and 18, the side walls 12 and 14 including upper and lower

rods 20 and 22 which are maintained in spaced and operative relationship with each other by means of substantially U-shaped side members 24 operatively connected to said upper and lower rods. The side walls 16 and 18 include substantially square frame members 26 and also have U-shaped side members 24 secured thereto and serving to maintain the upper and lower extremities of the frame members 26 in spaced relationship with each other.

The upper and lower rods 20 and 22 of the side walls 12 and 14 are provided with loops 28 at their opposite extremities which engage the upper and lower corners of the frame members 26 of the side walls 16 and 18 to provide pivotal connections between the side walls 12, 14, 16, and 18 whereby said side walls may be folded toward each other into the collapsed position shown in Fig. 2 of the drawings and whereby they may be reversely pivoted into the expanded condition of the container 10 shown in Fig. 1 of the drawings.

The bottom 30 of the container 10 is constituted by a plurality of horizontally oriented, transversely extending members which are constituted, in the present embodiment of the invention, by parallel, spaced, closed loop wire members 32 which have their opposite extremities encompassing the lower extremities of the opposed side walls 12 and 14 and which are pivotally engaged therewith whereby, when the side walls 12, 14, 16 and 18 are collapsed or expanded, the closed wire loops 32 are correspondingly collapsed or expanded.

Each of the U-shaped side members 24 includes a pair of vertically oriented legs 34 whose upper extremities are secured, as by means of welding or the like, to the upper extremities of the side walls with which they are associated. In the case of the side walls 12 and 14, the upper extremities of the legs 34 are secured to the horizontally oriented rods 20, and in the case of the side walls 16 and 18 the upper extremities of the legs 34 are secured to the upper extremities of the frame members 26 of said side walls.

The legs 34 of the U-shaped members 24 are secured adjacent their lower extremities to the lower rods 22 of the side walls 12 and 14 and to the lower extremities of the frames members 26 of the side walls 16 and 18. Adjacent the point of securement of the legs 34 to the respective portions of the aforesaid side walls, they are bent outwardly, as best shown at 36 in Fig. 3 of the drawings, to displace the bights 38 of the U-shaped members 24 outwardly beyond the vertical plane of the side walls with which the individual bights 38 are associated to provide interlocking means 40.

The function of the interlocking means 40 constituted by the outwardly displaced bights 38 of the U-shaped members 24 is to maintain superimposed containers 10 in aligned, inoperative relationship in the manner shown in Fig. 3 of the drawings. When a container 10 is superimposed upon another container 10, as illustrated in the aforesaid figure, the interlocking means 40 of the superimposed container overlies and depends below the adjacent extremities of the side walls 12, 14, 16, and 18 of the lower container 10. Therefore, the possibility of disengagement of the upper container from operative engagement with the lower container is eliminated and a secure interlock is achieved therebetween.

In addition, the interlocking means 40 serves the further purpose of spacer means adapted to engage a floor or other surface 42 upon which the container 10 of the invention may be located. Therefore, the bottom wall 30 of the container 10 is located above the floor 42 and the possibility of contamination of the contents of the container 10 by dirt, moisture, or other contaminants is forestalled.

It will be noted that vertically oriented stiffening rods 46 are interposed between the vertically oriented legs 34 of the side members 24 of the container 10 whereby displacement of articles in the container 10 through the space between the legs 34 will be prevented. It should also be pointed out at this juncture that the formation of the interlocking means 40 integrally with the side walls 12, 14, 16, and 18 of the container 10 materially rigidifies the interlocking means. Moreover, the manner in which the legs 34 of the side members 24 are bent at 36 to underlie the lower extremities of the side walls provides a substantial bearing area for the side walls and prevents the separation of the lower extremities of the side wall members 24 from operative relationship with the side walls with which they are associated.

As previously indicated, the bottom 30 of the collapsible container 10 is constituted by a plurality of closed wire loops 32. The opposite extremities of the closed wire loops are, as best shown in Figs. 3 and 4 of the drawings, located in encompassing relationship with the vertically oriented legs 34 of the U-shaped side members 24 of the side walls of the container 10, thereby establishing a pivotal connection of said closed wire loops with the associated legs 34. Moreover, it will be noted that, as best shown in Fig. 1 of the drawings, the closed wire loops have their opposite extremities welded or otherwise fastened together at only one point 48, thereby facilitating the securement and formation of the wire loops 32 in operative relationship with the side walls of the container 10. In addition, the utilization of the closed wire loops provide a broader supporting area for articles deposited in the container 10, such as the egg cartons 49 shown in phantom lines in Fig. 1 of the drawings.

Operatively associated with the loop members 32 constituting the bottom 30 of the container 10 are retention means 50, said retention means being constituted by transversely oriented bars 52 which are secured adjacent the lower extremities of the legs 34 of the U-shaped side members 24 in spaced relationship with the lower extremities of the side walls 12, 14, 16, and 18 and which overlie the adjacent extremities of the wire loops 32. Thus, upward displacement of the respective extremities of the wire loops 32 from the lower extremities of the associated side walls is prevented and the cocking or displacement of the closed wire loops 32 is thus eliminated.

An alternative embodiment 60 of the container of my invention is shown in Figs. 5 through 8 of the drawings. The container 60 includes side walls 62, 64, 66, and 68, the side walls 62 and 64 including upper and lower rods 70 and 72 which are maintained in spaced and operative relationship with each other by means of substantially U-shaped side members 74 operatively connected to said upper and lower rods. The side walls 66 and 68 include substantially square frame members 76 and also have U-shaped side members 74 secured thereto and serving to maintain the upper and lower extremities of the frame members 76 in spaced relationship with each other.

The upper and lower rods 70 and 72 of the side walls 62 and 64 are provided with loops 78 at their opposite extremities which engage the upper and lower corners of the frame members 76 of the side walls 66 and 68 to provide pivotal connections between the side walls 62, 64, 66 and 68 whereby the side walls may be folded toward each other into the collapsed position shown in Fig. 6 of the drawings and whereby they may be reversely pivoted into the expanded position shown in Fig. 5 of the drawings.

The bottom 30 of the container 60 is of substantially the same construction as the bottom 30 of the previously described container 10 and, therefore, specific reference will not be made to the details of construction thereof.

However, each of the U-shaped side members 74 differs considerably in construction and mode of operation from the side members 24 described in the previous embodiment 10 of the invention and will thus be described in detail.

Each of the U-shaped members 74 includes a pair of

vertically oriented legs 84 whose upper extremities are bent outwardly at an angle of approximately 45°, as shown at 85, to define an interlocking zone 87 between the upper extremities of said legs for a purpose which will be described in greater detail below. The means of securement of the legs 84 to the respective side walls may be by welding or the like.

It will be noted that the lower extremities of the legs 74 are secured to the inner sides of the lower rods 72 of the side walls 62 and 64 and to the inner sides of the lower extremities of the frame members 76 of the side walls 66 and 68. Therefore, the bights 88 of the side members 74 are disposed in planes located inwardly of the planes of the respective side walls 62, 64, 66, and 68.

In addition, the extreme lower portions 90 of the side wall members 74 are bent inwardly, as best shown in Figs. 7 and 8 of the drawings, in order that they will clear the upper extremity of the side wall of a lower basket, as best shown in Fig. 7 of the drawings, when the lower extremities 90 of the bights 88 are inserted in the interlocking zone 87 between the upper extremities 85 of the legs 84 of associated side members 74. Furthermore, the bights 88 engage securely on adjacent portions of the side walls of the lower basket 60, as illustrated in Fig. 8 of the drawings, to frictionally engage said side walls and prevent accidental displacement of the bights from operative engagement with said side walls.

Therefore, when a container 60 is superimposed upon another container 60 in the manner shown in Fig. 7 of the drawings, the bights 88 are located in the interlocking zones 87 and are guided by the angularly bent upper extremities of the legs 84 of the members 74 into proper registry so that the upper and lower extremities of the side walls will engage instantly and accurately with each other, as best shown in Figs. 7 and 8 of the drawings. Moreover, since the lower extremities 90 of the bights 88 are bent inwardly, they clear the upper extremities of the side walls of the basket disposed therebelow and serve to permit the creation of the frictional lock between the bights 88 and the adjacent portions of the side walls of the lower basket.

Since the wire of which the side wall members 74 is fabricated is slightly resilient, deflection of the bights 88 by adjacent portions of the side walls of the containers 60 occurs to permit a slightly wedging action of the bights 88 with respect to the side walls of the lower basket, thus enhancing the frictional lock achieved by the co-operation of the bights 88 with the lower container 60.

I thus provide by my invention a collapsible container which is characterized by the ease with which it can be expanded and collapsed. Also of considerable importance is the fact that the container of my invention can be manufactured at a moderate cost and is characterized by the sturdiness and simplicity of its construction.

Inherent in the manner in which the container of the invention functions to achieve its desired purpose is the provision of the integral locating means on the side walls and the closed wire loops constituting the bottom of the container and maintained at the bottom of the container by means of retention means associated with the side walls.

By virtue of the alternative embodiment of the container of my invention, a positive interlock is achieved between the superimposed and lower container resulting from positive alignment of the side members of the containers with one another and the frictional engagement of the bights of the side members of the upper container with the contiguous areas of the side walls of the lower container.

If desired, the loop wire members 32 may be eliminated and flat sheet metal strips having openings in the opposite extremities thereof pivotally engaging the lower extremities of the opposed side walls 12 and 14 may be substituted therefor. In such case, the opposite extremities of the flat sheet metal strips are, of course, disposed below the retention means 50 constituted by the transversely oriented bars 52 to prevent upward displacement of said strips.

I claim:

1. In a container, the combination of: a plurality of side walls pivotally secured to one another at their contiguous extremities, said side walls including upper and lower rods maintained in spaced relation by a plurality of vertically oriented, spaced rods secured to said upper and lower rods at their extremities; a bottom pivotally secured at opposite extremities to the lower extremities of two of said side walls, said bottom being constituted by a plurality of closed loop, wire members pivotally secured to the lower extremities of said side walls; and means on said vertically oriented rods for maintaining said closed loop, wire members at the lower extremities of said side walls, said maintaining means being constituted by transverse cross members secured to said vertically oriented, spaced rods adjacent said lower rods to maintain said closed loop, wire members against upward displacement from their positions in juxtaposition to said lower rods.

2. In a container, the combination of: a plurality of side walls pivotally secured to one another at their contiguous extremities, said side walls including upper and lower rods maintained in spaced relation by a plurality of vertically oriented, spaced rods secured to said upper and lower rods at their extremities; and a bottom pivotally secured at opposite extremities to the lower extremities of two of said side walls, said bottom being constituted by a plurality of closed loop, wire members pivotally secured to the lower extremities of said side walls and said bottom members having their opposite extremities encompassing the lower extremities of said vertically oriented rods whereby, when said container is collapsed by urging said side walls toward one another, said bottom members will be pivoted into proximity to one another, said maintaining means being constituted by transverse cross members secured to said vertically oriented, spaced rods adjacent said lower rods to maintain said closed loop, wire members against upward displacement from their positions in juxtaposition to said lower rods.

3. In a container, the combination of: a plurality of side walls pivotally secured to one another at their contiguous extremities, at least two of said side walls including upper and lower rods and a substantially U-shaped side member fastened between said rods, the bight of said U-shaped member depending below said lower rod to serve as interlocking means for said container and the legs thereof serving as side rods on said side walls, said bight being bent inwardly at the lower extremity thereof to provide a guide portion for engagement with the upper rods of a similar container disposed below said container, a bottom pivotally connected to the lower extremities of two of said side walls and consisting of a plurality of closed loops encompassing the lower extremities of said legs; and retention means on said two side walls for preventing upward displacement of said closed loops from the lower extremities of said side walls, said retention means being constituted by transverse bars extending between said legs and overlying said closed loops to retain said closed loops adjacent said lower rods.

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