United States Patent

Hayes

[15] **3,635,361**

[45] **Jan. 18, 1972**

[54] HANDLING PERISHABLE PRODUCTS

[72] Inventor: **William H. Hayes,** Overland, Kans.

[73] Assignee: **Alton Box Board Company,** Alton, Ill.

[22] Filed: **July 31, 1969**

[21] Appl. No.: **846,385**

[52] **U.S. Cl.**.....**214/10.5 R,** 206/65 R, 220/97 B, 229/DIG. 11

[51] **Int. Cl.**.....**B65g 1/14**

[58] **Field of Search**.....214/10.5; 224/45.7, 487; 220/97 B; 229/1.5, DIG. 11; 206/65, 65 R

[56] **References Cited**

UNITED STATES PATENTS

2,420,393	5/1947	Dorsey	214/10.5
2,851,188	9/1958	Pavelle	214/10.5 X
2,874,834	2/1959	Woodward	206/65
3,049,245	8/1962	Nelson	214/10.5

FOREIGN PATENTS OR APPLICATIONS

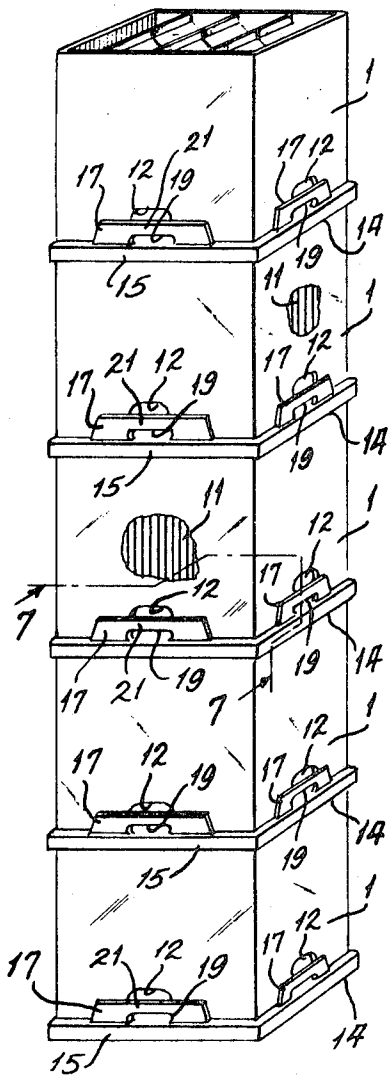
187,074	10/1936	Switzerland	220/97 B

Primary Examiner—Gerald M. Forlenza
Assistant Examiner—Frank E. Werner
Attorney—Paul M. Denk

[57] **ABSTRACT**

Packaging and handling of perishable products in stacks of articulated disposable containers, in which the disposable containers are intervened and articulated by a rebated ring having a major perimeter and a minor perimeter with an intermediate ledge, and the respective perimeters being proportioned so that the minor perimeter embraces the outside of an articulated container, above, and the major perimeter embraces the outside of another articulated container below, the ring.

3 Claims, 8 Drawing Figures



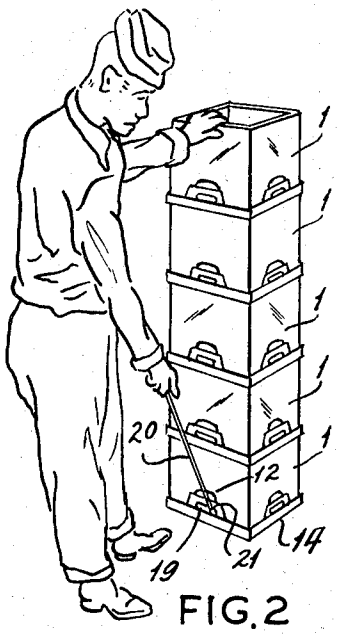


FIG. 2

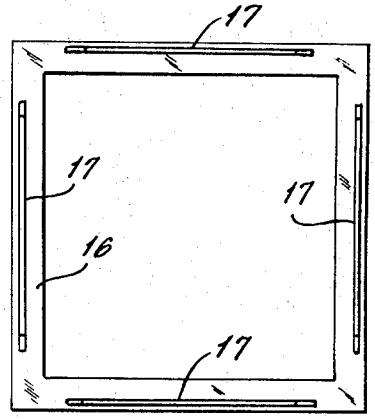


FIG. 4

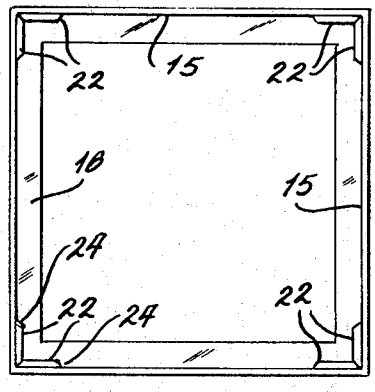


FIG. 5

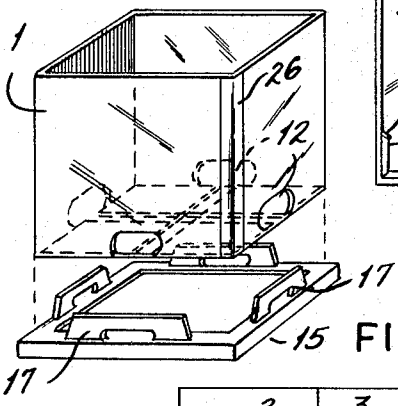


FIG. 6

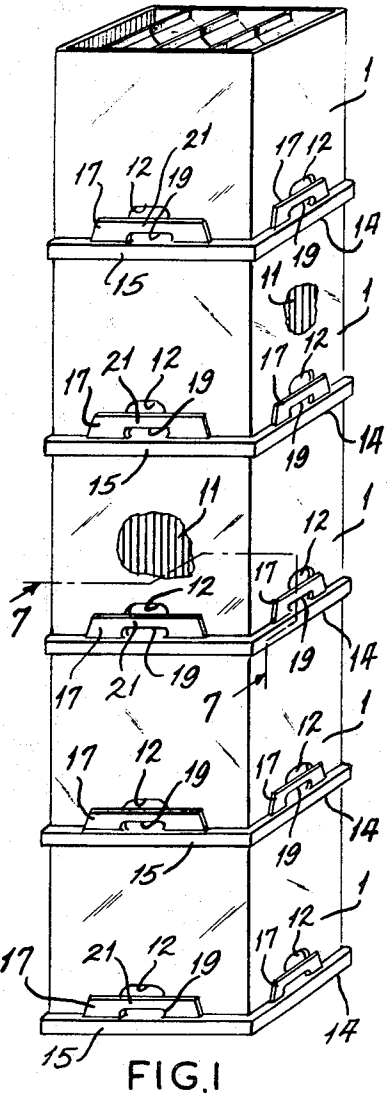


FIG. 1

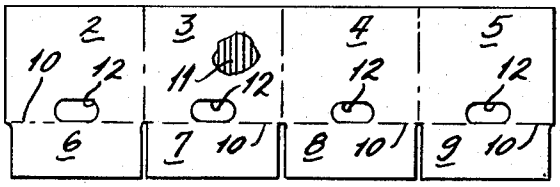


FIG. 3

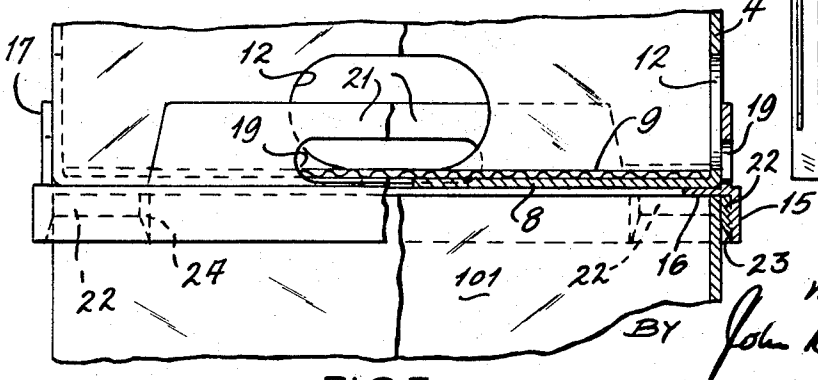


FIG. 7

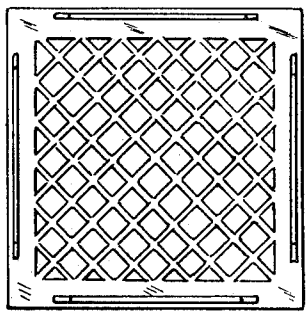


FIG. 8

INVENTOR:
WILLIAM H. HAYES
BY John H. Butterland
ATTORNEY.

HANDLING PERISHABLE PRODUCTS

This invention relates generally to the packaging and handling of perishable merchandise, especially merchandise which must be handled under refrigerated or moist conditions, and particularly to a method and apparatus for handling vertical stacks of paperboard boxes or trays in a manner compatible with the demands of the dairy and other perishable products business.

Dairy products are customarily handled and transported under more or less refrigerated conditions. For example, a substantial number of cartons or bottles of milk are customarily packed in open top containers, such as crates, boxes, or baskets of wood, metal, or plastic, in which they are moved into and out of refrigerated storage spaces, into and out of transportation vehicles, and into retail establishments, or other comparable facilities, where the perishables are removed from the open top container and placed on display in refrigerated showcases. In the case of dairy products, it is more or less standard practice for the open top boxes of metal or plastic to have an internal cross section (horizontally) of a magnitude such as to accommodate four 1-gallon cartons of milk (or 9 half-gallons, or 16 quarts); and such boxes are frequently equipped at their upper rim with an integral ferrulelike enlargement within which the bottom of an identical container is intended to interfit when a conventional stacking machine drops the latter onto the former.

In some cases, the delivery man unloads the open top containers at the point of delivery, but in most instances, they are left laden at the delivery site to be unloaded later by someone else and stored out of sight until the delivery man makes his next trip to that location when they should be picked up and returned to the central dairy facility. Even if the delivery man empties the open top containers at the retail establishment, and takes them back to the central dairy facility on the same trip, they need be stored there until their next use.

Thus, storage space for the empty open top containers is required at one or both ends of the journey and the requirement is enormous. Furthermore, the manpower consumed in having them available for use in the right place at the right time involves a burdensome expense.

It is therefore the object of the present invention to improve the aforesaid system of transporting and handling such products, and in particular to provide disposable (one-time use) paperboard containers with reusable protective armor which requires a minimum of storage space when not in use, but which serves not only to reinforce the paperboard containers, but to articulate a plurality of them together, as well as to provide a convenient means for manipulating the same singly or in an articulated stack.

In essence, the aforesaid objective is accomplished by forming the open top containers, or trays, of corrugated paperboard in which the corrugations of all the sidewalls run vertically, and providing them with articulating armor interconnecting a plurality of such containers together in a vertical stack, protecting the corners of the individual containers, providing a sled to render a stack thereof vertically stable, yet slidable along the floor of a building or the bed of a slide conveyor or of a vehicle. The articulating armor contemplated by the present invention is necessarily constructed of material more durable than the type of corrugated paperboard used for making containers, which is to say that the material of the armor is not only more resistant to moisture, but more resistant to abuse, and indeed is stiffer than corrugated paperboard of the character usually employed in the manufacture of containers. In particular, the articulating armor provided in accordance with the present invention is a rebated ring formed of metal (such as aluminum or steel) or of a durable plastic composition (such as styrene molding compounds). The term "rebated," as used herein, is intended to connote that the subject ring or articulating member has two coaxial geometrically similar peripheries with an integral escarped shoulder or shelf between them. While the coaxial peripheries may be of the same magnitude, it is preferred that one be greater than the other so as to provide the articulating ring

with a section of major periphery and a section of minor periphery. More specifically, when in use, the section having the major periphery is preferably below the section having the minor periphery. One or both of the sections may be abbreviated, i.e., its periphery is not necessarily continuous, but it is preferred that the section which, in use, is the lower be continuous. Rebated articulating armor having the aforesaid characteristics, properties and relationships is adapted to have one of its peripheries telescopically embrace the bottom increments of an open top corrugated paperboard container or tray of the type aforesaid, while the other periphery of the same articulating member is adapted to telescopically embrace the top edges of another substantially identical paperboard container or tray—thereby to articulate the two trays in vertically aligned relationship.

The articulating armor thus interlocks the top of a lower tray, in a given stack, with the bottom of a superposed tray of identical size in the same stack. Since all trays for use with a given size and style of articulating armor will necessarily be of the same horizontal cross section, such containers or trays are herein referred to as "modular," it being understood that they can be handled individually with or without associated articulating armor; or they can be handled in an articulated stack four or five modules high with intervening articulating armor members.

Referring now to the drawings for an illustrative embodiment of the invention:

FIG. 1 is a perspective view of a stack of modular corrugated paperboard containers of the character contemplated by the invention, articulated together by the rebated rings of the present invention;

FIG. 2 is a perspective view showing a typical way of maneuvering the articulated stack shown in FIG. 1;

FIG. 3 is a development view of a blank for a modular container of the type shown in FIG. 1;

FIG. 4 is a top plan view of one form of rebated ring which articulates the modular containers together and protects them;

FIG. 5 is a bottom plan view of the rebated ring shown in FIG. 4;

FIG. 6 is an exploded perspective view showing the modular container in the process of being telescoped with an articulating ring of the kind shown in FIGS. 4 and 5;

FIG. 7 is a sectional view taken along line 7—7 of FIG. 1; and

FIG. 8 is a view corresponding with FIG. 4, but showing a modified form of articulating ring.

In one embodiment shown in FIGS. 1 and 2, the modular containers 1 are topless trays, but each is provided with a bottom formed, in the usual manner of slotted containers, from a blank such as that shown in FIG. 3. As the modular containers 1 are illustrated as being square in horizontal cross section, the several sidewall panels 2, 3, 4 and 5 all have the same dimension parallel to the longer dimension of the blank. Bottom flaps 6, 7, 8 and 9 are hinged to the respective sidewall panels at crease line 10. Such flaps will be understood by those skilled in the art to constitute the bottom of the container when folded inwardly about crease line 10 after the container is erected by connecting the free edge of panel 2 with the free edge of panel 5 to form the common manufacturer's joint in accordance with the usual practice of manufacturing slotted containers of the taped joint type. It is desirable that the blank shown in FIG. 3 be formed of corrugated paperboard in which the corrugations run in the direction shown at 11 in FIGS. 1 and 3, thereby providing greater stiffness for the container in the vertical direction (as seen in the drawing) than in other directions. The blank or selected increments thereof, or the erected container, may be conventionally treated to inhibit or reduce moisture absorption.

The blank shown in FIG. 3 is provided with a handhole 12 in each sidewall panel adjacent the crease line 10. As shown, and for a purpose to be later described, the lower edge of the handholes 12 are substantially tangent with the crease line 10.

While it is not indispensable to provide such handholes, such does add to the convenience of the arrangement when, as contemplated, the laden modular containers are likely to be handled individually.

As shown in FIGS. 1 and 2, the several modular containers 1 are articulated together, protected and stabilized by the provision of an articulating ring 14 at the bottom of the stack, and an identical ring between each pair of successive modular containers 1 thereabove. The preferred form of ring 14 is shown in FIGS. 4, 5 and 6, and consists of a quadrilateral peripheral member 15 having an inwardly projecting ledge 16, and thereabove a series of peripheral members 17. The peripheral members 15 are addressed downwardly from the ledge 16, while the peripheral members 17 are addressed upwardly therefrom. As clearly shown in FIG. 7, the external periphery of the peripheral members 15 is greater than the virtual external periphery defined by the peripheral members 17 above ledge 16. On the other hand, the internal peripheries defined by the members 15 and 17 are preferably substantially equal to each other, and equal to the external periphery of the several modular containers 1 at the upper edge thereof, as well as adjacent the bottom thereof.

As clearly seen in FIG. 6, the periphery delineated in part by the members 17 is discontinuous—the bottom increments of the modular containers 1, which internest or telescope within the members 17, being unconfined at their corners—whereas in the case of the periphery defined by the members 15, which are adapted to internest with and telescope over the open upper increments of the modular containers 1, the arrangement is such that physical engagement with the container walls is confined to the corner areas, as will be later described.

The bottom of the modular container 1 is constituted of overlapping panels 6, 7, 8 and 9, which preferably are so dimensioned as to fall short of having opposite ones meet each other, thereby leaving a central ventilation hole 18 in the bottom of each modular container 1.

As clearly shown in FIG. 7, the members 17, which define the periphery of the articulating ring above ledge 16, extend upwardly to a level approximating half the height of the handhole 12, thereby exposing a substantial part of the handhole 12 above the level of members 17. As shown, each of the members 17 in the articulating rings have handholes 19 of substantially smaller size than the handholes 12 in the modular containers 1. In the articulated relationship shown in FIG. 7, the handholes 12 and 19 overlap so that when a given modular container is removed from a stack thereof, such as that shown in FIG. 1, and handled individually, it may be so handled in or out of the articulating ring as the handler chooses. Specifically, if the handler inserts his fingers in handhole 12 above the level of member 17, the modular container will be handled free of the articulating ring, whereas if the handler inserts his fingers into handhole 19, the articulating ring will serve as a carrier for the superjacent modular container. Otherwise, the overlapping relationship between handhole 12 and member 17 serves the useful purpose of enabling an articulated stack of the containers to be maneuvered in the manner illustrated in FIG. 2, where a handler has a rod 20 with a hook on the lower end of it, and a handle on the upper end of it, so that when it is desired to move an articulated stack of containers, the hooked end of the rod 20 is inserted through the portion of handhole 12 which extends above member 17; the hook on rod 20 engaged behind the strip 21 (which overlies handhole 19) in member 17, with the tang of the hook projecting outwardly through handhole 19. In this relationship, the rod 20 can be used as the drawbar of a vehicle to transmit a moving force to the lowermost one of the articulating rings in a stack, and upon application of a pulling force to the rod 20, said lowermost one of the articulating rings acts as a boat or sled, to glide the articulated stack of containers over the floor of a building, a loading platform, vehicle body or the like.

Unlike the periphery defined by the members 17, the periphery defined by the members 15 is entire, but designed so that it engages the top increments of the subjacent container 101 only near the corners thereof, where the thickness of the member 15 is approximately double the thickness thereof between the corners, as clearly seen in FIG. 5. In the embodiment shown, a steel or aluminum angle bar is employed to constitute both member 15 and ledge 16, the same being cut, bent and welded to form the quadrilateral frame shown in FIGS. 4 and 5; and the members 17, with or without horizontally extending flanges, being appropriately welded or riveted thereto.

As mentioned previously, the thickness of member 15 at the corners is approximately double its thickness elsewhere. This is accomplished by applying a fillet 22 at each side of each corner, as clearly shown in FIG. 5. The fillets may be held firm to the angle bar base by welding, riveting, or other suitable means. As clearly shown in FIG. 7, the lower inner corner of the fillets 22 is chamfered as shown at 23, and so are the ends of the fillets remote from the corner, as shown at 24 in FIG. 5. Such chamfering of the fillets is important to prevent mutilation of the modular containers of the present invention—and resultant instability of a stack thereof—by conventional stacking machinery. Such machinery operates by picking up a container or the like, moving it over a stationary container or the like, and then dropping the picked up one onto the stationary one. Such machinery cannot assure that the picked up body will be dropped in uniformly perfect alignment with the stationary body, and since disalignment at the time of dropping may mutilate the top line (particularly a corner) of the stationary one of trays 1, and thereby render the stack unstable, the internal periphery at the lower edge of member 15 is made greater than the external periphery at the top of trays 1. Said greater periphery is gradually constricted by the slope of the chamfers 23 (two in each corner) so as to "funnel" the raw edge topline of a container 101 into the relationship shown in FIG. 7, despite the fact that such raw edges may have been a tray-wall thickness in disalignment with the dropping assembly of articulating ring and superposed tray.

In the form shown in FIG. 8, the articulated ring is identical in all particulars with that shown in the other figures, except that within the frame provided by the ledge 16, there is a reticulated floor which may be formed of wire mesh, perforated sheet metal, expanded metal, hardware cloth, or the like. Such a reticulated floor is to be recommended in cases where the modular containers 1 have not been subjected to treatment which will substantially reduce the hygroscopicity of the corrugated paperboard of which the modular containers 1 are made.

In the form shown in FIG. 3, the blank is of the type which is "closed" by tape 26 at the corner formed between the remote edges of panels 2 and 5, but it will be understood that when desired, the common manufacturer's joint flaps may be provided.

The invention contemplates one-time use of the containers 1. That is to say, they are disposable. Hence it is not necessary to consume great space, either at the point of delivery or at the point of return, for their storage. And since prior to use they are storable flat, the space required is about one-fifth that required at the plant site with the prior art system described on page 2 hereof; and the storage space required at the retail site is zero because the retailer can use the paperboard tray for "carryouts." When they are erected, the bottom flaps 6, 7, 8 and 9 are secured together preferably by glue, and the trays can be immediately charged with merchandise.

Upon delivery at destination, the articulating rings are retrieved by the delivery man, and returned to the central plant for reuse, but since the articulating rings internest with each other, the space required for transporting and storing them is minimal.

Moreover, the paperboard trays plus articulating armor involves a tare weight less than half that of the prior art system; and an overall conservation of delivery man's time of about 25 percent.

From the foregoing description, those skilled in the art should understand that the invention provides a simple,

economical and efficient arrangement for the handling of perishables in disposable paperboard containers without substantial risk that the paperboard container will fail in one-trip service; and with other substantial economic advantages. While one complete embodiment of the invention has been disclosed in detail, and certain alternatives indicated, it is not to be understood that the invention is limited to the details of the foregoing disclosure.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. An articular container comprising a plurality of equisized modular trays, in vertically aligned relationship, a rebated ring disposed in telescoping relationship between successive ones of said trays, there being handholes provided in said ring, there being handholes provided through said trays; and the handholes in a ring are disposed to align at least in part with the handholes in a tray when in said telescoping relationship.

2. An articular container comprising a plurality of equisized modular trays, in vertically aligned relationship, a rebated ring disposed in telescoping relationship between successive ones of said trays, said trays having a bottom and substantially equisized opposite sidewalls rising from and forming corners with a bottom, and handholes in said sidewalls adjacent said bottom.

3. Articular container for holding merchandise comprising a plurality of equisized modular trays, each tray being of multisided configuration and formed from paperboard with the corrugations in its sidewalls running vertically, said trays being arranged in vertically aligned relationship, a rebated ring disposed in telescoping relationship between successive ones of said trays, each container ring combination disposed for supporting the downward force of the weight of the merchandise laden containers and rings disposed thereabove, and said rings being of a material which is harder than and less hygroscopic than the tray.

* * * * *