United States Patent

[11] 3,565,320

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[21] Appl. No. **803,828**
[22] Filed **Mar. 3, 1969**
[45] Patented **Feb. 23, 1971**
[73] Assignee **Westvaco Corporation**

[54] REFRIGERATED SHIPPING CONTAINER

10 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **229/14;** 229/23; 62/371; 229/15
[51] **Int. Cl.** **B65d 5/58,** F25d 3/08
[50] **Field of Search** ..... 229/23 (B), 6 (A), 15, 14 (H); 62/371, 372

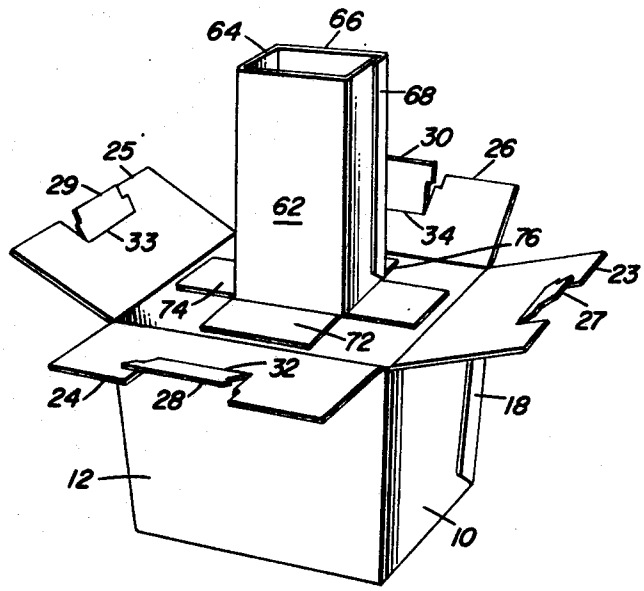
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ABSTRACT: A two component refrigerated shipping container is disclosed including an outer container and an inner container, said inner container being located within the outer container but isolated from the walls thereof so that the product to be shipped can be packed around the inner container and refrigerant added to the inner container, and said outer container including top closure flaps which cover the product for shipment yet leave the refrigerant filled inner container open for reicing and deicing.



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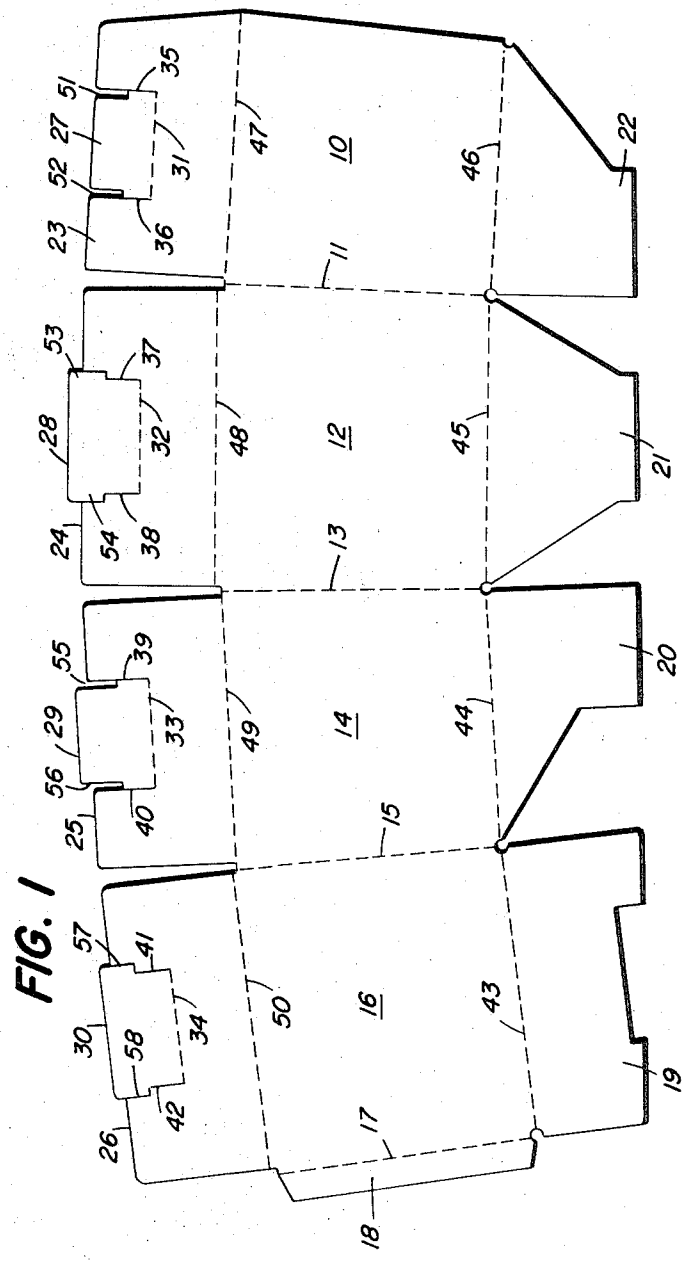


FIG. 1

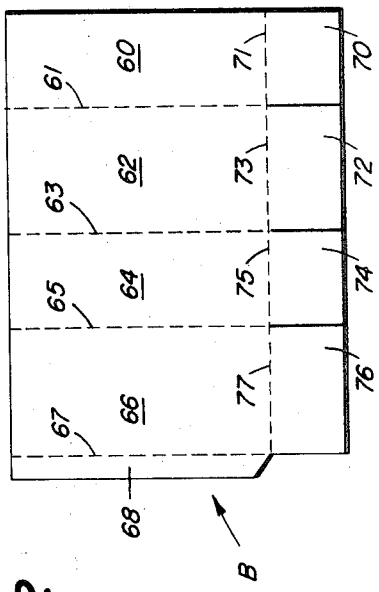


FIG. 2

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FIG. 3

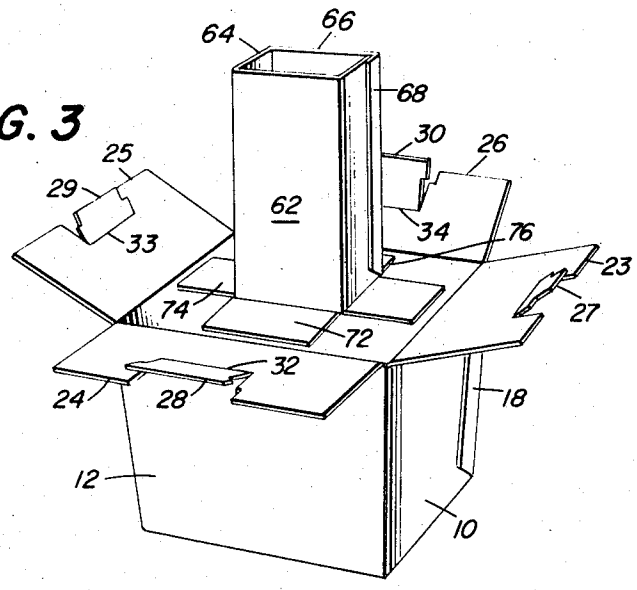


FIG. 4

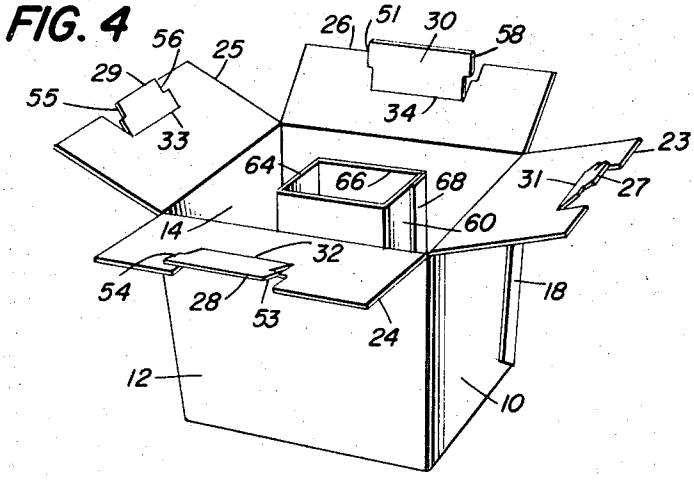
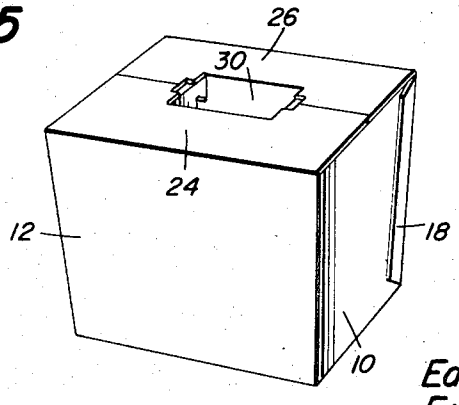


FIG. 5



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REFRIGERATED SHIPPING CONTAINER

SUMMARY OF THE INVENTION

This invention relates to improvements in shipping containers, and more particularly to relatively lightweight refrigerated containers which have general utility in the transport of perishable goods. The container of the invention in its preferred embodiment employs a novel refrigerant retaining an outer container reinforcing insert adapted to receive a heat absorbing material. The invention was developed as a result of the need for a shipping container which would separate the refrigerant from the product. As an attendant benefit to separating the product from the refrigerant, it was desired to construct a container which would eliminate the possibility of bruising the product to be shipped and also provide a means for reicing the container if necessary without reopening it. The container employed by this invention may be made from solid fiberboard, corrugated paperboard or any other suitable material.

The successful shipping of relatively fragile, perishable goods and the like has long presented a problem. It is important, for instance, to keep the product completely fresh and relatively unmovable in the shipping container. Regardless of the care with which the packages are handled, damage will often occur if the refrigerant dissolves or otherwise disappears and if the contents of the container are allowed to loosely move around.

In some of the prior art containers, which this package is intended to replace, the exterior of the package was made from wood, or from corrugated paperboard with wooden inserts. Obviously these containers could not satisfy the basic requirements of product safety and continuous refrigerability that has been achieved by the present novel container.

It is therefore among the objects of this invention to provide a refrigerated shipping container for shipping corn, radishes, spinach and most other fruit and produce. The invention would also be useful as a replacement for currently used bag-in-box shipping containers with a simple reversal of function of the two components.

Another object is to provide the user with a refrigerated shipping container which can be trucked to the field in knocked-down condition thereby offering the advantages of ease of handling, a minimum of storage space required and a consequent reduction in transportation charges. The shipping container would then be set up at the site, packed with the product in the field, and iced at the growers shed without opening and repacking, thereby saving one step from that required with conventional refrigerated shipping containers. This feature also offers more insurance against the possibility of bruising the product since it is only handled once from the grower to the market.

A further object of the present invention is that no stitching or other manipulation is required by the packer. The container may also be tapered for nesting when not in use and improved air circulation during shipment. Upon arrival at the market, the container, because of its construction, is easy to dispose of simply by knocking it down again into its flattened condition.

Still another object of the invention is the advantage of better insulation and less water absorption because of the novel construction and design.

Yet another advantage of the present container is the important feature of being able to add additional refrigerant without reopening to expose the product. The unique refrigerant insert which allows this provision also gives the container improved stacking strength.

In addition, the container of this invention is preferably vented to provide added ventilation and to keep the product fresh. Vents are also provided with wet ice refrigerant so that the refrigerant effluent does not remain in the container. The blanks from which the two parts of the shipping container are formed are preferably coated or otherwise treated with a wax or plastic covering to protect the container from the deteriorating effects of wet ice effluent. Of course, the unique design of the present invention is not limited to refrigerated products because it could just as readily be used for shipping two different products, unmixed in the same container. It would, for instance, be possible to pack the product in the inner container and surround the product with a refrigerant. The bag-in-a-box technique could be used for this purpose. However, this arrangement would result in a reversal of function of the two components of the shipping container so that reicing would not be possible without reopening the closure flaps of the outer container. Hence this modification would only be useful where an initial application of ice was sufficient to retain the freshness of the product, or where the initially iced container was to be shipped in a refrigerated truck or rail car. On the other hand, the novel shipping container of the present invention when used in the above noted way would permit readily available access to the product being shipped to permit inspection or constant supervision without reopening.

It is, moreover, the purpose and object of this invention to improve the structure, utility and effectiveness of refrigerated shipping containers, and more particularly shipping containers wherein the refrigerant is wet ice located within an open-topped cell which is in turn securely fixed in the center of the product-carrying container.

The invention also consists of the parts and in the arrangements and combinations of parts hereinafter specifically described and claimed. An example of the preferred embodiment is accordingly depicted in the accompanying drawing which forms a part of this disclosure.

DESCRIPTION OF THE DRAWING

FIG. 1 shows in blank form one configuration that the shipping container might take;

FIG. 2 shows in blank form an example of the refrigerant carrying insert for the shipping container;

FIG. 3 shows the setup form of the two parts with the refrigerant carrying insert about to be placed inside the shipping container;

FIG. 4 shows the assembled container prior to being filled with the product to be shipped; and,

FIG. 5 shows the container completely closed and filled with refrigerant.

DETAILED DESCRIPTION

The container of this invention consists of two integral parts, one of which fits inside of, and is locked in place by a second larger part. The inner part comprises, in its preferred embodiment, a vented tubelike configuration which is designed to hold a quantity of ice or other refrigerant, while the second or larger part takes the form of a conventional tapered carton for housing the product to be shipped under refrigeration. In the assembled condition, the refrigerant tube is positively located in the center of the outer container by means of flaps or the like located on the lower end of the tube, and by locking flaps foldably attached to the upper edges of the outer container sidewalls which lock the upper end of the refrigerant tube in place. Prior to folding over and locking the outer container top closure flaps, the product is packed around the refrigerant tube, and when the flaps are folded over, they completely enclose the product leaving the refrigerant tube open for later reapplication of ice or other refrigerant. This configuration means that the product is handled only once, yet there is opportunity for additional reicing. Also, because of the existence of the central ice cell, good stacking strength is achieved.

Referring now particularly to FIG. 1 of the drawing, there is shown a typical blank from which the outer container of the present invention might be constructed. The embodiment specifically described herein is tapered, however, it could just as readily have straight sides. An advantage of the tapered sidewall configuration lies in the increased strength the container obtains where loads are absorbed both vertically and

horizontally. The preferred container comprises four tapered sidewalls **10**, **12**, **14** and **16** which are separated from one another by fold lines **11**, **13** and **15**. These sidewalls are suitably sized so as to produce a container of the desired configuration for the product to be shipped. Adjacent one of the sidewalls **16** is a closure tab or manufacturers joint **18** hingedly attached along fold line **17**. A self-locking bottom closure is also preferred and illustrated although any form of bottom closure could be used. Typical self-locking bottom closure flaps **19**, **20**, **21** and **22** are shown foldably attached to the container sidewalls along the fold lines **43**, **44**, **45** and **46**. These flaps are arranged so that after the container is formed by securing tab **18** to the opposite sidewall **10**, the bottom closure flaps are interlocked with one another.

To set up the locking bottom closure, flap **19** is folded initially, then the flaps **20** and **22** are folded over flap **19**. Finally the flap **21** is folded over flaps **20**, **22** and tucked under flap **19**. This step is accomplished, without bending flap **21**, by forcing the already folded flaps **19**, **20**, **22** down inside the container until the tab on the end of flap **21** slips readily under the slot on flap **19**. Reversing this sequence of folding steps allows the outer container to be quickly and efficiently knocked down after shipment so as to resume its flattened condition for subsequent reuse.

Along the upper end of the outer container sidewalls **10**, **12**, **14** and **16** are located the top closure flaps **23**, **24**, **25** and **26** separated from the respective sidewalls by fold lines **47**, **48**, **49**, **50**. Each of the top flaps **23—26** contain the novel locking flanges which are adapted to locate and secure the center ice cell inside the container.

Two of the top flaps **23** and **25** include locking flanges **27**, **29** formed by fold lines **31**, **33** respectively located in the flaps themselves. Flap **23** contains additional cut lines **35**, **36** which extend from the ends of fold line **31** to a pair of slot portions **51**, **52** located at each side of the locking flange **27**. Similarly, flap **25** contains additional cut lines **39**, **40** which extend from the ends of fold line **33** to a pair of slot portions **55**, **56** located at each side of the locking flange **29**. The slot portions formed at each side of the locking flanges **27**, **29** are so located to cooperate with tab portions formed on the locking flanges of the remaining two top flaps **24**, **26**.

Top flaps **24**, **26** hingedly attached to their respective sidewalls along fold lines **48**, **50**, include locking flanges **28**, **30** formed by fold lines **32**, **34** respectively located in the flaps themselves. Flap **24** contains additional cut lines **37**, **38** which extend from the ends of fold line **32** to form a pair of tab elements **53**, **54**. These tabs as hereinbefore mentioned, engage the slots **52**, **55** of locking flanges **27**, **29** respectively when the outer container A is set up. Similarly flap **26** contains additional cut lines **41**, **42** which extend from the ends of fold line **34** to form a second pair of tab elements **57**, **58**. The tabs engage the slots **51**, **56** of locking flanges **27**, **29** respectively when the outer container A is set up. When the top closure flaps are folded to cover the packed product, the locking flanges are manipulated so as to securely lock the inner container in position. At this time the product is protected from contamination from the field to the user and the open topped ice cell is exposed for additional reicing and for deicing at the terminal point.

If, on the other hand, it was desired to ice the container only once and then ship it in a refrigerated car or truck so that additional icing would not be needed, it is within the contemplation of this invention to use only one pair of the top closure flaps as a means for locking the inner ice cell in position. The other pair of top closure flaps could then be folded over and stitched or taped together to completely enclose both the produce and the ice cell.

The novel outer or product carrying container comprises conventional sidewalls, a self-locking bottom and top closure flaps which include locking flanges for retaining the inner ice cell in position.

FIG. **2** of the drawing illustrates the ice cell tube B in blank form. The tube comprises four sidewalls **60**, **62**, **64** and **66** separated from one another by fold lines **61**, **63** and **65**. Attached along fold line **67** to the wall panel **66**, is a closure tab or manufacturers joint **68** for securing the tube together in its preferred rectangular configuration prior to insertion inside the outer container. In order that the ice cell tube B might be more securely positioned inside the outer container, provision is made for flanges or flaps on the bottom of the tube which extend from the tube to the respective sidewalls of the outer container. The tube flanges **70**, **72**, **74** and **76** are each connected to a respective sidewall along fold lines **71**, **73**, **75** and **77**.

When the ice cell tube is set up and tab **68** secured to panel **60**, the bottom flanges **70**, **72**, **74** and **76** are folded outward about fold lines **71**, **73**, **75** and **77** and the tube is inserted in the outer container as shown in FIG. **3**. The product is next packed around the inner container substantially as illustrated in FIG. **4**, then the inner container or ice cell is filled with refrigerant. Finally, the locking flanges **27**, **28**, **29** and **30** are folded over the respective sidewalls of the ice cell and the tabs and slots on the locking flanges engaged with one another to secure the package for shipment.

FIG. **5** shows the completely assembled, packed and iced container ready for shipment. It is clear that the integrated package is strong and secure and because the ice cell is left open, it is readily reiced should the original refrigerant melt.

It will be understood that only a preferred embodiment of the invention has been disclosed and changes in detail may be resorted to without departing from the field and scope of the invention.

We claim:

1. A two component shipping container for shipping refrigerated products comprising:

a. an outer container product component formed from a scored and cut blank of paperboard or the like having a plurality of sidewalls hingedly connected to one another along fold lines;

b. bottom closure flaps foldably attached to the lower edges of each of said outer container sidewalls for closing the entire bottom of said outer container;

c. top closure flaps foldably attached to the upper edges of each of said outer container sidewalls and having their free edges spaced apart to leave a central opening in the top of said outer container; and

d. an inner container refrigerant component formed from a cut and scored blank of paperboard or the like having a plurality of sidewalls with means attached thereto for maintaining the inner container under the central opening of the outer container and spaced from the walls of said outer container.

2. The shipping container of claim **1** wherein said spacing means comprises flaps foldably attached to the lower edges of each of said inner container sidewalls.

3. The shipping container of claim **2** wherein the top closure flaps attached to said outer container sidewalls each have means on the free edges thereof for securing the upper end of said inner container in spaced relation to said outer container sidewalls.

4. A two component shipping container for shipping refrigerated products comprising:

a. an outer container formed from a scored and cut blank of paperboard or the like having a plurality of sidewalls hingedly connected to one another along fold lines;

b. bottom closure flaps foldably attached to the lower edges of each of said outer container sidewalls;

c. top closure flaps foldably attached to the upper edges of each of said outer container sidewalls;

d. an inner container fitted inside of and spaced from the walls of said outer container;

e. said inner container having a plurality of sidewalls hingedly connected to one another along fold lines, and means attached thereto for maintaining the inner container in spaced relation to the walls of said outer container;

f. said spacing means comprising flaps foldably attached to the lower edges of each of said inner container sidewalls;

g. the top closure flaps of said outer container each having means on the free edges thereof for securing the upper end of said inner container in spaced relation to said outer container sidewalls; and

h. said securing means comprising locking flanges cut from the top closure flaps which tuck inside said inner container sidewalls to close the peripheral space around said inner container and leave open the upper end of said inner container.

5. The shipping container of claim 4 wherein the locking flanges of each top closure flap are formed by a pair of cut lines which extend from the free edge of each top closure flap to a fold line lying perpendicular to said cut lines and substantially in the center of each top closure flap.

6. The shipping container of claim 5 wherein the locking flanges on alternate opposed pairs of said top closure flaps contain tab elements formed by the cut lines, and the locking flanges on the other pairs of said top closure flaps contain slot areas formed by the cut lines so that the adjacent tabs and slots may interlock with one another when the top closure flaps are folded to close the peripheral space around said inner container.

7. The shipping container of claim 6 wherein the outer container sidewalls are tapered throughout their length.

8. The shipping container of claim 7 wherein both the outer container blank and the inner container blank are coated with a water impervious coating.

9. The shipping container of claim 8 wherein both the outer container blank and the inner container blank are vented for use with wet ice refrigerant.

10. The shipping container of claim 9 wherein said bottom closure flaps are self locking.