

March 30, 1965

I. S. FLAMM ETAL

3,175,748

FREEZER CARTON

Filed Feb. 18, 1963

4 Sheets-Sheet 1

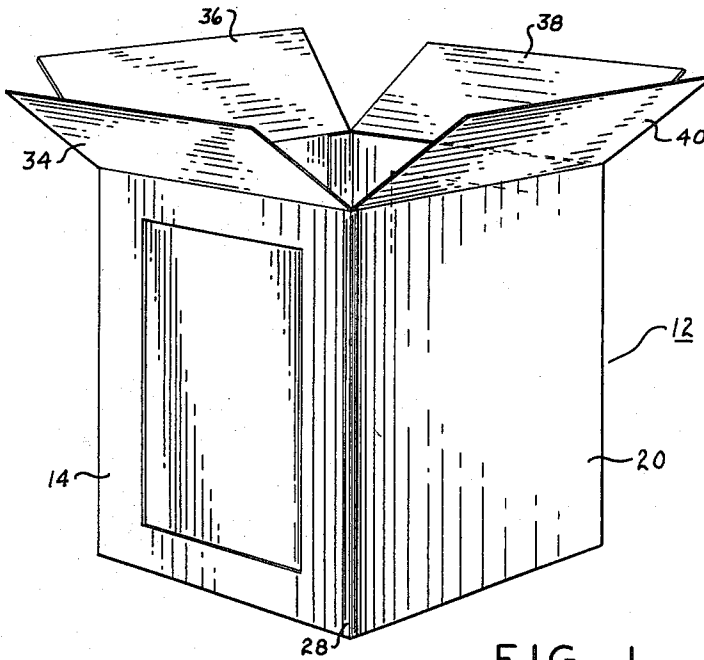


FIG. 1

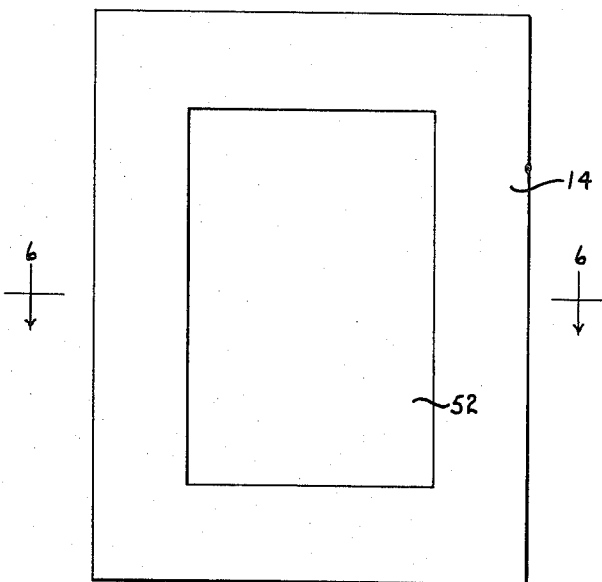


FIG. 2

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4 Sheets-Sheet 2

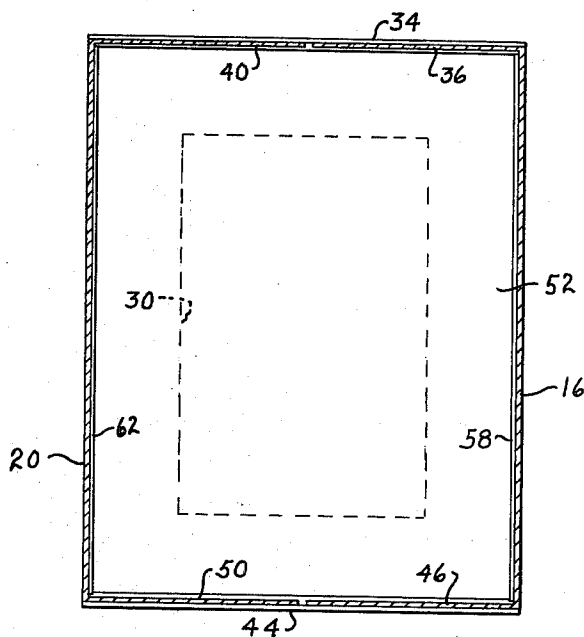


FIG. 5

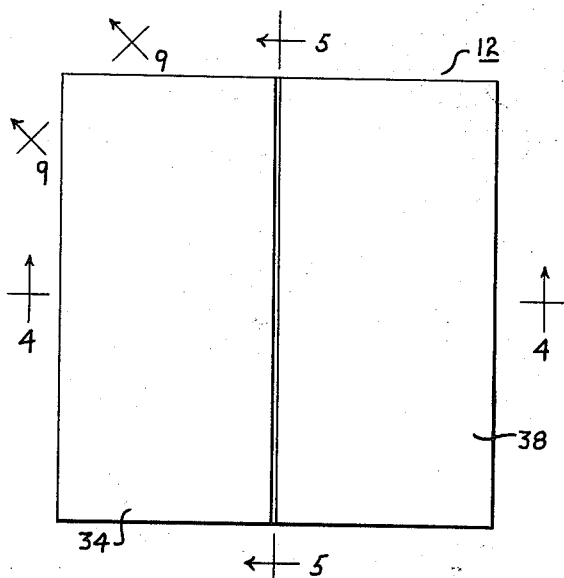


FIG. 3

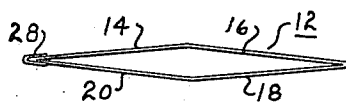


FIG. 7

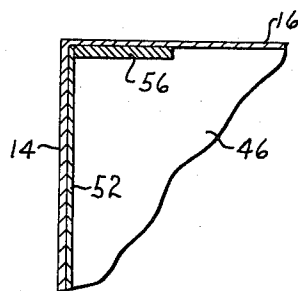


FIG. 9

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4 Sheets-Sheet 3

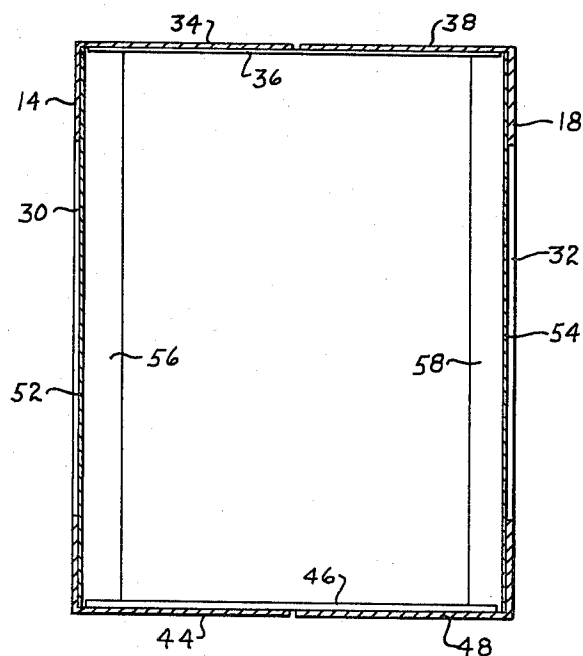


FIG. 4

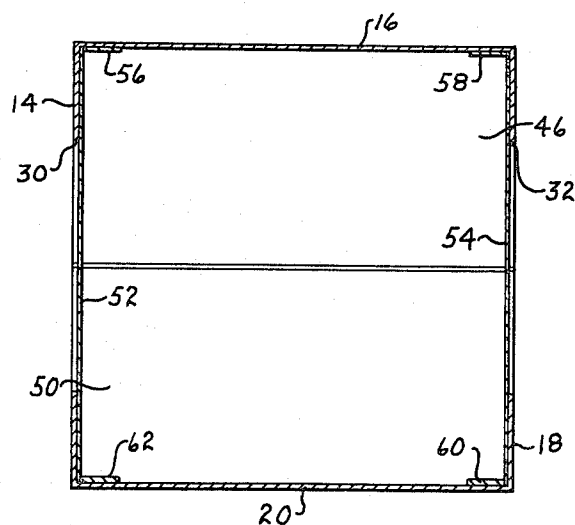


FIG. 6

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3,175,748

FREEZER CARTON

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6 Claims. (Cl. 229-6)

The present invention relates to a carton, and more particularly to cartons so constructed and designed that effective heat and cold transfer is obtained between the carton contents and the ambient air and other similar cartons.

After fruit, such as strawberries and cherries, has been processed, it is stored in freezers and cooled as rapidly as possible to below twenty-six degrees Fahrenheit to prevent the growth of bacteria and hence eliminate spoilage of the fruit. In the past, metal cans have been almost universally used for this purpose since the heat and cold conductivity is much greater than available substitute materials such as corrugated fiberboard and plastic materials. The conventional metal cans used for this purpose are of the cylindrical type usually fabricated in plants separate from the fruit processing plants, and hence must be shipped or hauled between the fabricating and processing plants and stored at the processing plant until they are used. The cans are satisfactory with respect to the required heat transfer or dissipation characteristics; however, they have a number of inherent disadvantages which render them unsatisfactory and/or uneconomical for this purpose. For example, an excess amount of storage and shipping space is required for the fully formed cans, and in view of their bulk, they are difficult to handle in shipping and are normally difficult to discard and dispose of after the contents have been removed. Further, the cylindrical metal cans do not stack conveniently to substantial heights and require excessive amounts of space in the freezer or cold room for the amount of processed fruit contained therein. It is therefore one of the principal objects of the present invention to provide a carton for frozen foods, such as fruit, which can be fully fabricated and folded for shipping and storing in a compact form utilizing to a maximum the available shipping and storage space, and which can readily and easily be unfolded preparatory to filling.

Another object of the invention is to provide a freezer container having all the advantages of a corrugated carton with respect to weight, compactness and foldability and most of the advantages of metal containers with respect to strength and rigidity and heat and cold transference.

Still another object of the invention is to provide an easily and economically fabricated and handled freezer container which can be economically shipped, stored and used, and which can be easily discarded and disposed of in compact packages or loads without the use of any special equipment.

A further object is to provide a freezer carton of the aforesaid type which can be effectively vented to facilitate heat and cold transfer without danger of spoilage of the contents, and which will effectively transfer heat and cold from one carton to another and dissipate the heat rapidly to the ambient air for rapid cooling.

Another object is to provide a carton constructed of corrugated fiberboard and sheet metal, which can be compactly stacked in relatively high tiers without damaging the carton or injuring the carton contents, and which can be easily sealed and unsealed without using any special tools or equipment.

Additional objects and advantages of the present inven-

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tion will become apparent from the following description and accompanying drawings, wherein:

FIGURE 1 is a perspective view of the present carton showing the carton in its opened position;

FIGURE 2 is a side elevational view of the present carton;

FIGURE 3 is a top plan view of the carton shown in FIGURES 1 and 2;

FIGURE 4 is a vertical cross sectional view of the present carton, the section being taken on line 4-4 of FIGURE 3;

FIGURE 5 is a vertical cross sectional view of the carton shown in the preceding figures, the section being taken on line 5-5 of FIGURE 3;

FIGURE 6 is a horizontal cross sectional view of the carton taken on line 6-6 of FIGURE 2;

FIGURE 7 is a plan view of the present carton showing it in its folded condition;

FIGURE 8 is an elevational view of the internal side of the present carton showing it in one stage of the fabricating procedure; and

FIGURE 9 is an enlarged fragmentary cross sectional view of a portion of the present carton taken on line 9-9 of FIGURE 3 and showing details in the carton construction.

Referring more specifically to the drawings, numeral 12 indicates generally the present freezer carton showing the preferred shape adapted for most economical handling and use as a container for frozen fruits, vegetables and the like; however, the size and shape of the cartons may vary from one processor to another and from one kind of fruit or vegetable to another. The present carton consists of four side walls or panels 14, 16, 18 and 20, preferably formed from a single sheet of corrugated fiberboard and then folded at creases 22, 24 and 26 to form three corners, and joined at its two ends by gummed tape 28 or other suitable securing means to permanently join panels 14 and 20, thus forming the structure illustrated in FIGURE 7. The four panels 14, 16, 18 and 20 may be formed from standard corrugated fiberboard; however, other materials, such as plain fiberboard or plastic material, may be used to an advantage under certain operating conditions.

Panels 14 and 18 are initially provided with windows 30 and 32 which are blanked or otherwise cut from the respective panels and are preferably rectangular in shape and cover a substantial portion of the panels, leaving only sufficient margin therearound to provide adequate strength for the respective panels. The upper edges of the four panels are provided with flaps 34, 36, 38 and 40 for forming the top of the carton for the respective panels 14, 16, 18 and 20, and the lower edges of these panels are provided with flaps 44, 46, 48 and 50, respectively, for forming the bottom of the carton. While the carton is still being formed and is in the condition shown in FIGURE 8, sheet metal plates 52 and 54 are placed on the side of panels 14 and 18 and secured thereto by cement, glue or other suitable securing means. The two sheet metal plates 52 and 54 are substantially the same size as panels 14 and 18; however, they may be slightly narrower if desired. Secured to each edge of panels 16 and 20 are reinforcing strips 56 and 58 on panel 16 and strips 60 and 62 on panel 20. These four strips are preferably corrugated fiberboard of the same material from which the four panels are made and may be varied in width to give the compression strength desired to the fully fabricated carton. These strips are cemented or otherwise firmly secured to the respective panels and are spaced inwardly from the edges of those panels only sufficiently to permit proper folding along creases 22, 24 and 26 and proper joining of the two side

edges of panels 14 and 20. After the structure shown in FIGURE 8 has been completed, the panels are folded into a rectangularly-shaped structure and the edges of panels 14 and 20 are joined by the tape. If the carton is not to be used at that time, it is normally folded into the condition shown in FIGURE 7 and a series of the cartons stacked to form an easily handled, compact package for shipping and storing.

In the packaging of certain types of fruits, it may be an advantage to provide circulation through the container to facilitate and expedite chilling to a temperature below freezing, and to accomplish this, vents 64 and 66 are provided at the top of panels 16 and 20, and vents 68 and 70 are provided at the bottom of these two panels. Vents 64 and 66 at the top of the two panels may be used alone, eliminating the vents at the bottom of those two panels.

The plates 52 and 54, while preferably of metal, may be of other suitable, effective heat conducting material, such as thin plastic material, and they may be constructed of a number of different types of metals, such as coated steel or aluminum. The thickness of the material is not critical so long as sufficient thickness is provided to retain the contents securely in the carton and to give some strength to the respective sides of the carton.

After the fabricated section shown in FIGURE 8 has been completed, it is folded into a rectangular structure and, when it is ready for use, the bottom flaps 44, 46, 48 and 50 are folded inwardly and sealed with cement, glue or tape. The container is then filled with fruit or other produce to be chilled, and upper flaps 34, 36, 38 and 40 are folded inwardly, as illustrated in FIGURES 4 and 5, and cemented, glued or taped, thus providing a completely sealed container for the produce. The rectangular shape provides compact units which can be effectively stacked, one on the other, to substantial heights without crushing those in the lower tiers. This type of carton provides an economically produced and easily handled carton and saves materially on space over the conventional cylindrical can normally used in the industry. Experience has shown that the present carton decreases by fifty percent over comparable cartons without windows 30 and 32 and metal panels 52 and 54, the time required to chill the produce contained therein from approximately room temperature to about twenty-six degrees Fahrenheit.

When the present carton has been emptied, it can be readily discarded and disposed of by merely burning the corrugated fiberboard, thus leaving only the flat metal panels 52 and 54 as residue.

While only one embodiment of the present invention has been described in detail herein, various changes and modifications may be made without departing from the scope of the present invention.

We claim:

1. A container for frozen fruit, vegetables and the like, comprising four panels of corrugated fiberboard joined together along their vertical edges to form the side walls of a foldable rectangular container, flaps on the lower edges of each panel for forming the bottom of the container, flaps on the upper edges of each panel for forming the top of the container, two opposite side wall panels having a rectangular cut-out section covering a substantial portion of the respective panel, a plate of sheet metal secured to the inner surface of each panel with said cut-out section and being substantially co-extensive with said inner surface, and strips of fiberboard secured to the inner surface along the two vertical edges of the other of said panels and extending from the top to bottom thereof for reinforcing said walls, two of said panels

having a plurality of holes adjacent the upper and lower edges thereof.

2. A container for frozen fruit, vegetables and the like, comprising four panels of corrugated fiberboard joined together along their vertical edges to form the side walls of a foldable rectangular container, flaps on the lower edges of each panel side wall for forming the bottom of the container, flaps on the upper edges of each panel side wall for forming the top of the container, two opposite side wall panels having a cut-out section covering a substantial portion of the respective panel, a plate of sheet metal secured to the inner surface of each panel with said cut-out section and being substantially coextensive with said inner surface, and strips of fiberboard secured to the inner surface along the two vertical edges of the other of said panels and extending from the top to bottom thereof for reinforcing said walls.

3. A freezer carton, comprising four panels of corrugated fiberboard joined together along their vertical edges to form the side walls of a foldable rectangular container, flaps on the lower edges of each panel side wall for forming the bottom of the container, flaps on the upper edges of each panel side wall for forming the top of the container, two opposite side wall panels having a rectangular cut-out section covering a substantial portion of the respective panel, and a plate of sheet metal secured to the inner surface of each panel with said cut-out section and being co-extensive with said inner surface.

4. A freezer carton, comprising four panels of corrugated fiberboard joined together along their vertical edges to form the side walls of a foldable rectangular container, flaps on the lower edges of each panel side wall for forming the bottom of the container, flaps on the upper edges of each panel side wall for forming the top of the container, two opposite side wall panels having a cut-out section covering a major portion of the respective panel, and a plate of high heat and cold conducting material on the inner surface of each panel with said cut-out section.

5. A freezer carton, comprising four panels joined together along their vertical edges to form the side walls of a foldable rectangular container, flaps on the lower edges of each panel side wall for forming the bottom of the container, flaps on the upper edges of each panel side wall for forming the top of the container, two opposite wall panels having a cut-out section covering a major portion of the respective panel, a plate of good heat and cold conducting material on the inner surface of each panel with said cut-out section, and strips of fiberboard secured to the inner surface along the two vertical edges of the other of said panels and extending from the top to bottom thereof for reinforcing said walls.

6. In a freezer carton comprising four panels joined together along their vertical edges to form a container: two opposite wall panels having a rectangular cut-out section covering a major portion of the respective panel, and a plate of sheet metal on the inner surface of each panel with said cut-out section and being substantially coextensive with said inner surface.

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