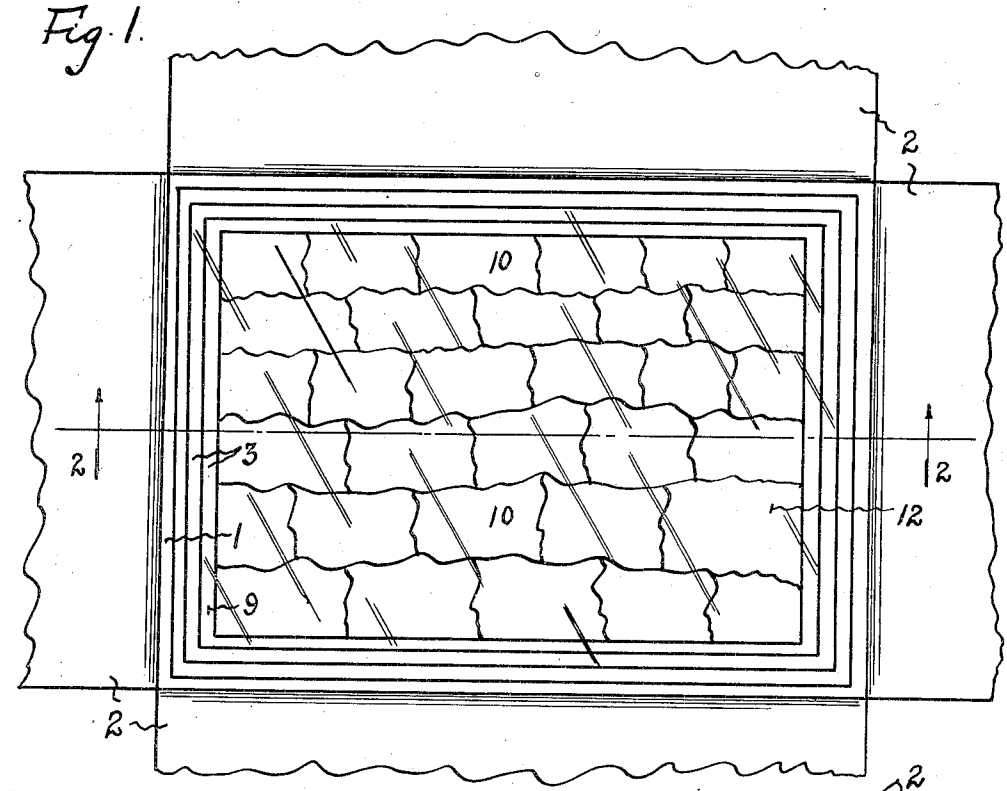
Dec. 13, 1932. D. W. DRUMMOND 1,890,771

TRANSPORTATION AND DISPLAY PACKAGE AND METHOD

Filed Jan. 29, 1931

Fig. 1.



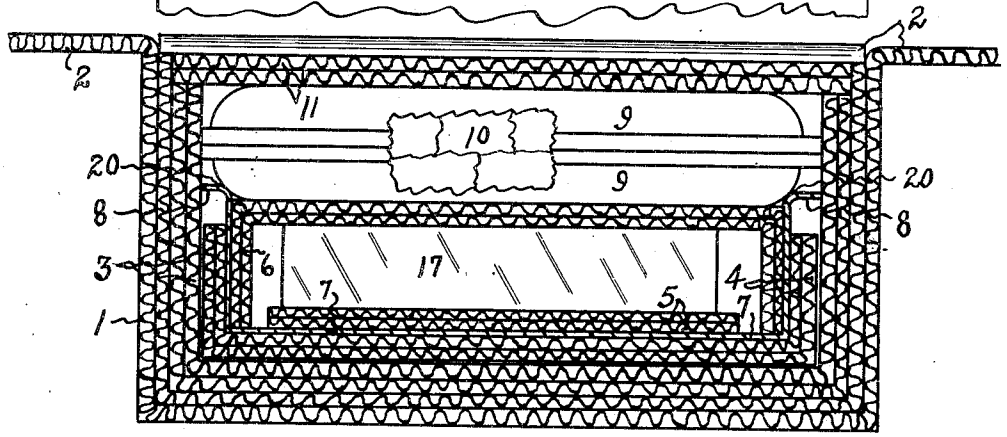


Fig. 2.

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UNITED STATES PATENT OFFICE

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TRANSPORTATION AND DISPLAY PACKAGE AND METHOD

Application filed January 29, 1931. Serial No. 512,064.

This invention relates to a novel transportation and display package and the method involved in refrigerating, transporting and displaying perishable food products.

One of the objects of this invention is the provision of a novel association of elements including a sealed package enclosing a refrigerating medium and perishable products in heat exchange relation.

A further object of this invention is the provision of heat conducting means between the perishable products and the refrigerating medium.

Another object of this invention is to provide a transportation package of the above nature so constructed that it can be used as refrigerated display package when it reaches its destination.

A still further object of this invention is the provision of a structure of this type employing solid carbon dioxide as a refrigerating agent which also supplies gas container to eliminate the air therefrom.

Another and important object of this invention is the provision of the above elements thermally associated for heat exchange under control at the proper rate so that the food products may or may not be frozen.

These and many other objects as will appear from the following disclosure are secured by means of this invention.

This invention resides substantially in the combination, construction, arrangement, relative location of parts and the methods involved as will appear from the following:

Referring to the drawing,

Fig. 1 is a top plan view of the container with the cover open, modified, in that the upper insulating wall has been replaced by a sheet of glass.

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1.

The general object of this invention is to provide a transportation package for use in the shipment of perishable products which are refrigerated therein to the proper degree depending upon the nature of the perishable products and which may be employed as a refrigerated display case when it reaches its destination.

In general, the invention involves a heat insulating container which in transit is sealed tight. Within this container is a smaller container comprising two telescoping parts within which is enclosed the refrigerating medium which in the best practice of this invention is solid carbon dioxide. Associated with the inner container in heat exchange relation is a metal conducting strip which extends externally of the inner container and upon which rests a metal receptacle for the perishable products. Fitting snugly within the outer container and over all of these parts is a heat insulating wall which, when the outer container is closed, lies fully within it.

The invention may be applied in refrigerating any desired perishable products such as meat, fish, fruits, ice cream, liquids and the like.

This invention has been found to be particularly useful in connection with the transportation to distant points of fish and meat such as fillets.

One of the important objects of the invention involves the relationship of the perishable products and the refrigerant to permit a control heat exchange so that the perishable products may be maintained approximately at desired temperatures; for example, in the shipment of fish, it is desirable to maintain the fish at approximately 38° F. which is sufficiently above freezing and sufficiently below temperatures at which the decomposition sets in, to insure that the fish reaches its destination in its natural condition. An advantage of the use of solid carbon dioxide is that although the container is substantially air tight, the gas generated gradually displaces the air, therein decreasing the tendency to decay.

Referring to the drawing there is shown at 1, a suitable container or carton having four integral flaps 2. This carton may be made as disclosed of corrugated paper or fiber to provide a heat insulating wall. It is of course apparent, that the size and shape of and materials used in the construction of the container are not important so long as the desired strength and heat insulating qualities are secured. To further increase heat insu-

lation, if desired, several layers of heat insulating material 3 may be employed to line the interior of the container. Within the outer container is a small container or receptacle comprising the two parts 4 and 6 which telescope together to provide a closed chamber.

At 7 is a metal strip which extends down into the lower half 4 of the receptacle at the ends thereof and extends across the bottom as shown. The two upper ends of this strip extend above the top of the receptacle along the ends thereof and terminate in the flanges 8. At 17 is represented the refrigerating agent which may be solid carbon dioxide which is prevented from resting directly on the metal strip 7 by means of a sheet of heat insulating material 5. If the refrigerating agent was directly in contact with the metal strip, heat would be absorbed from the refrigerating products so rapidly as to carry them far below the desired temperature. However, it is apparent, that in cases where it is desired to carry the temperature of the perishable products to, or below zero, this sheet 5 may be omitted. At 9 is a metal container for perishable products comprising two half sections of substantially the same form. This container or pan 9 fits snugly within the outer container and rests upon the flange 8 of the metal strip 7. There has been indicated at 10, the perishable food products within this pan which, in this case, may be fish fillets for example. The pan 9 rests upon the inner container as shown and is covered over by means of a sheet or plate 11, suitable heat insulating material which just fits within the outer container. The flaps 2 are then folded over as in the usual practice and the container sealed in any known manner.

The parts are so proportioned that they all fit within the outer container snugly to insure that they maintain the proper relation during transit. When the package reaches its destination, the flaps 2 are opened, the sheet of insulating material 11 removed and the other half of pan 9 taken off. A plate of glass 12 may be put in the position which the member 11 occupies in transit, thereby providing a refrigerated display cabinet.

The temperature of the perishable products within the thin metal container 9 is influenced by the quantity of solid carbon dioxide 17 which is placed within the inner container and by the area of contact as indicated at 20 between the flanges 8 and the metal pans 9. The temperature is likewise influenced by the quantity of perishable products within the pan. A very important point is that the area of contact between the flanges 8 and the metal pan 9 must be such that the transfer of heat from the perishable products to a point where it will do work in vaporizing the solid carbon dioxide will be at a rate which will maintain the perishable products within a desired temperature range under normal conditions encountered in transit. The particular temperature at which the products are to be held will depend upon the nature of the products and in the case of fish fillets, a temperature of about 38° F. is satisfactory. The generation of gas as the solid carbon dioxide absorbs heat from the perishable products results in an accumulation of carbon dioxide gas within the container gradually eliminating the air therefrom. This is desirable since decomposition is less liable to set in in an atmosphere of carbon dioxide gas.

It is often desirable in refrigerating some forms of food products to maintain them at a temperature above freezing and below a temperature at which decomposition occurs; for example, if fish fillets are maintained at 38° F. decomposition is arrested. It will be seen, therefore, that the rate of heat transfer from the perishable products to the refrigerating medium, depending upon the area of contact between the metal pan and the flanges 8, is important and may be controlled both during transit and during the time of display by means of this invention.

It is obvious that the carbon dioxide as it is evolved within the shipping container gradually displaces the air therein and then escapes therefrom by normal leakage, since the casing is, of course, not absolutely air tight.

This invention therefore resides in certain principles of construction, operation and use, which may be embodied in other physical forms than that given for purposes of illustration, and I do not therefore desire to be strictly limited to this disclosure but rather to the scope of the appended claims.

What I seek to secure by United States Letters Patent is:

1. A transportation package of the type described comprising a substantially air tight, heat insulating casing, an inner receptacle within said casing, a body of refrigerating material within said receptacle, a metal encased package of perishable food products within said casing and heat conducting means between said package and said refrigerant, proportioned to have a predetermined heat conducting capacity.

2. In a refrigerating and shipping package, the combination comprising a substantially closed heat insulating casing, an inner receptacle within said casing, solid carbon dioxide within the inner receptacle, a heat conducting casing for perishable products within said first mentioned casing and insulated from direct contact with the solid carbon dioxide and heat conducting means for conducting the heat from the heat conducting casing to solid carbon dioxide at a predetermined rate.

3. In a refrigerating and shipping package, the combination comprising a substan-

tially closed heat insulating casing, an inner receptacle within said casing, solid carbon dioxide within the inner receptacle, a heat conducting casing for perishable products within said first mentioned casing and insulated from direct contact with the solid carbon dioxide, and a metal strip in contact with the heat conducting container and in heat exchange relation with the solid carbon dioxide.

4. In a refrigerating and shipping package, the combination comprising a substantially closed heat insulating casing, an inner receptacle within said casing, solid carbon dioxide within the inner receptacle, a heat conducting casing for perishable products within said first mentioned casing, insulated from direct contact with the solid carbon dioxide, and a metal strip in contact with the heat conducting container and in heat exchange relation with the solid carbon dioxide, the area of contact between the heat conducting container and the metal strip being such that the rate of heat exchange will cause the perishable products to be maintained at approximately the desired temperature.

In testimony whereof I have hereunto set my hand on this 28th day of January A. D., 1931.

DONALD WATCHORN DRUMMOND.