

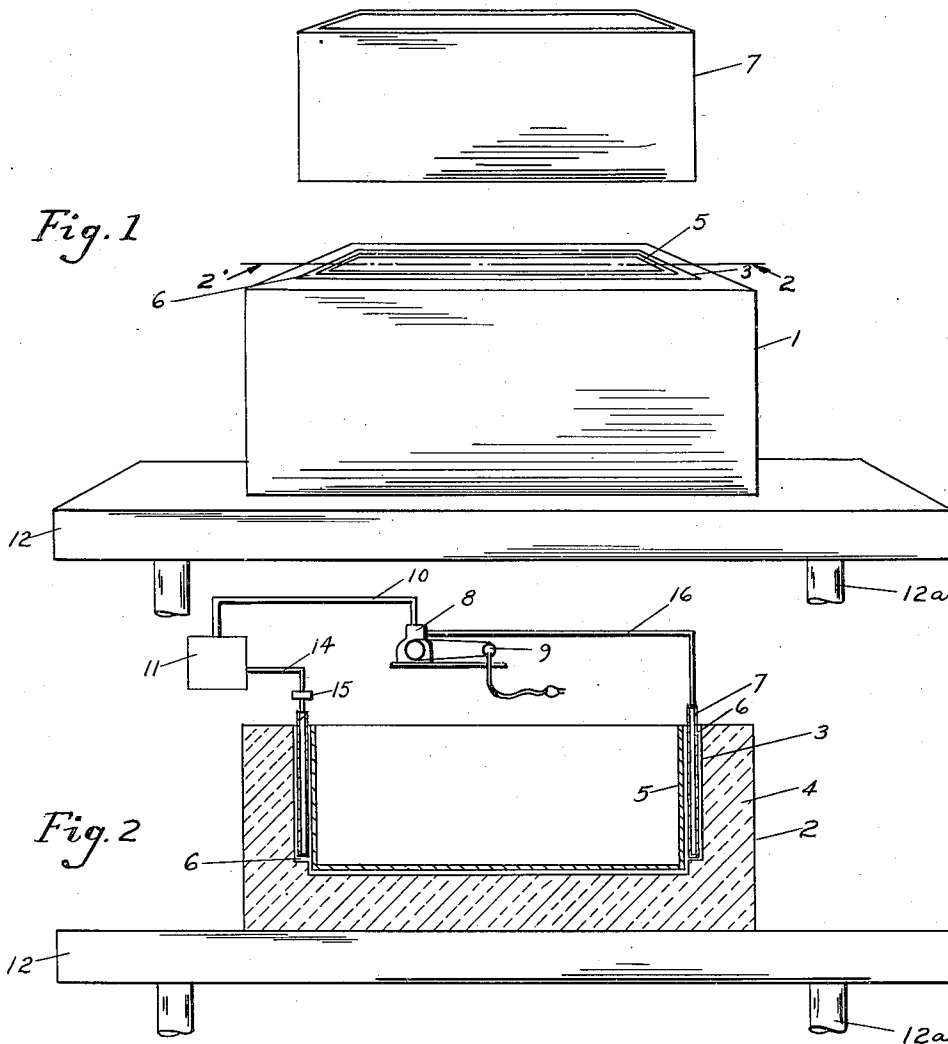
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METHOD AND APPARATUS FOR CHILLING CONTAINERS

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METHOD AND APPARATUS FOR CHILLING
CONTAINERS

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3 Claims. (Cl. 62—170)

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My invention relates to an improvement in a shipping container and has for one purpose to provide a means of shipping frozen materials, such as food.

Another purpose is to ship frozen materials in a manner that will maintain the freezing temperature for a considerable length of time.

Another purpose is to provide a means whereby the food and other materials can be frozen and the shipping container cooled with the same process element at the same time.

Another purpose is to provide means for simultaneously initially cooling a shipping container and the material to be shipped within the container.

Other purposes will appear from time to time in the course of the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Fig. 1 is a perspective view, illustrating the refrigerating unit withdrawn from the combination;

Fig. 2 is a vertical section, more or less diagrammatically illustrating the refrigerating element and its cycle; and

Fig. 3 is a section illustrating the shipping container closed and ready for shipment.

Like parts are indicated by like symbols throughout the specification and drawing.

Referring to the drawings, I illustrate, more or less diagrammatically, a shipping container 1, which may have side and bottom walls and is shown as having an open top. It will be understood that the walls are of insulating material or any suitable heat insulation. I illustrate the outer wall surface at 2 and the inner wall surface at 3. 4 generally indicates any suitable insulating body or material of which the container is formed. Adapted to be positioned in the container and preferably removable therefrom is the open top food container 5. The parts are preferably so shaped or proportioned that a circumferentially side space 6 extends about the sides of the food container 5.

In employing my invention, the container 1 may be positioned upon any suitable support 12. Any suitable platform may be used or a floor of the room in which the method is carried out. Assume that the container is in the position shown in Fig. 1 with the food container 5 in place, and suitably charged with the food or other material to be handled, the circumferentially extending refrigerating member or cold plate 7 may be dropped into position, in which it is shown in

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Fig. 2. The details of the refrigerating member do not, of themselves, form part of the present invention. I illustrate, however, any suitable members 8 which may be driven by any suitable motor 9. 10 indicates a high pressure duct extending to any suitable condenser 11. The liquid refrigerant flows at high pressure along the supply duct 14 to any suitable pressure reducing means indicated at 15. The volatile refrigerant is then evaporated in the member or plate 7 and returns by the suction duct 16 to the compressor 8. It will be understood that any suitable volatile refrigerant may be employed and any suitable refrigerating cycle, to cool the refrigerating member or plate 7, to the desired sub-freezing temperature. The entire operation may advantageously be carried out in a cold zone or refrigerated space. After the food or other material in the container 5 has been reduced to an adequately low temperature the refrigerating member 7 may be withdrawn and any suitable cover 1a applied, to close the otherwise open tops of the containers 1 and 5. It will be understood that the cover 1a has suitable heat insulating characteristics, and is suitably sealed to and secured to the container 1.

The method above described is applicable to the simultaneous cooling of both containers and their contents. It may be applied to containers of a variety of sizes, including containers which are used with or which actually constitute wheeled vehicles, such as refrigerating cars or the like. It will be understood, however, that it is within the limits of my invention partially to pre-cool the contents, if I wish. For example, where large masses of material, such as foods, are being handled, already frozen bodies or containers may be arranged in the container 5, to be thereafter reduced to the pre-determined desired low temperature. In either event the shipper container itself, and its contents, are being subjected to the simultaneous heat abstraction regardless of whether either or both may have been previously partly cooled by some other means.

Whereas I illustrate, as in the figures herein, means for permitting the insertion or positioning of a refrigerating element, such as 7, between the inner face of the outer container wall and the outer face of the food storage or container, it will be understood that it is immaterial so far as my invention is concerned whether the refrigeration member 7 is inserted from above, laterally or from below. It is also immaterial whether the refrigerating member 7 is moved into position in relation to the containers 1 and 5 or whether

the containers 1 and 5 are moved into position with relation to the refrigerating member 7. For example, the platform 12, may be a movable section with supports 12a adjusted by some piston means. Any suitable means, not herein shown, may be employed for raising the platform 12 and with it the containers 1 and 5 in relation to a more or less fixed, or possibly somewhat movable refrigerating member 7. Thus the entire excursion may be performed by raising the platform 12, or, as alternatives, the member 7 may be depressed or moved into position in relation to a fixed container 1, or, under some circumstances, both may be moved, in order to reduce the total excursion of either.

I illustrate members 1 and 5 with a top opening, as it is probably the most advantageous. However, the opening, during the cooling operation, may be at the bottom or at the sides. This can be done by merely tilting or positioning the containers 1 and 5 in the desired relation to the refrigerating member 7.

It will be realized that whereas I have shown a practical and operative device and one adapted for the carrying out of my method, nevertheless, the device may be widely changed and the method widely varied without departing from the spirit of my invention.

For example, and assuming that the outer member 1 is used for chilling the inner member 5, the inner member 5, which may be the refrigerating car or the like, is in effect cooled by positioning it in a pool of super-cooled air, chilled by the refrigerating member 7, and contained within the inner surface 3 of the outer container 1. In this embodiment of my invention, the movable container 5, after being suitably chilled, may be removed from the container 1, and separately handled. When the container 5 is to be removed from the outer container it may advantageously be filled with super-cooled material which has been cooled elsewhere. I may find it advantageous to apply adjacent cooling area and, in the course of conveying the food from its chilling zone, I may pass chilled air with it and employ it to chill or to assist in chilling the inner container 5 within the outer insulating container 1. It will be understood that when the inner container 5 is to be employed separately from the outer container 1, it is itself formed to a suitable thickness, of suitable heat insulating material. After it has been chilled, and filled with a chilled material, any suitably separate closure is applied to it, in heat insulating relationship.

The use and operation of my invention are as follows:

My device and method will facilitate the process of shipping frozen food by combining the process of freezing the food and cooling the shipping container in one action when the refrigeration plate is inserted between the walls of the shipper container and the food container. Between the walls of the cold plate, refrigerant is flooded in sufficient quantity to achieve quick freezing of the food.

The cold plate can either be lowered into space 6 between the food container and the shipping container or the shipping container with the food container inside it can be raised by various means into position so that the cold plate slides into space 6 between the food container and shipping container.

When the food is frozen the shipping container will also be reduced in temperature, and the cold plate either lifted out of the space 6 be-

tween the food container and the shipping container or the shipping container holding the food container lowered from its place when the cold plate occupies the space 6 between the food container and the shipping container. The cover 1a consisting of an inner and outer wall with insulation between is then placed on top of the shipping container and the device is ready to be shipped or stored for a considerable length of time while a freezing temperature is maintained.

Other applications and modifications and purposes of my invention have been described above.

Where the unit, as shown in Fig. 3, is shipped after merely having the cover 1a applied to it, the space 6 can be suitably filled with appropriately formed insulating material, shown at 6a in Fig. 3.

I claim:

1. The method of preparing food and the like for shipment and storage, which consists in providing an insulating receptacle, placing therein a removable food container, of such size as to leave a substantial clearance between the inner walls of the receptacle and the outer walls of the container, inserting liquid tight heat-extracting means in and substantially filling said clearance, continuing the extraction of heat until the temperature of the interior of the receptacle and the container contents has been reduced to an adequately low temperature, then removing the heat-extracting means and closing the receptacle and container for shipment and storage and preventing free circulation of ambient air about the food container.

2. The method of preparing food and the like for shipment and storage, which consists in providing an insulating receptacle, placing therein a removable food container, of such size as to leave a substantial clearance between the inner walls of the receptacle and the outer walls of the container, inserting heat-extracting means in and substantially filling said clearance, continuing the extraction of heat until the temperature of the interior of the receptacle and the container contents has been reduced to an adequately low temperature, then removing the heat-extracting means, filling the clearance with additional insulation, and then closing the receptacle and the container for shipment and storage.

3. In combination an insulating receptacle, a food container removably mounted therein, a heat-extracting means adapted to be inserted in the receptacle between the walls thereof and the container, means for operating said heat-extracting means to reduce simultaneously the temperature of the inner walls of the container and the receptacle and contents to a temperature sufficiently low for shipment and storage, and a closure adapted to close the receptacle after the heat extracting means are removed to prevent free circulation of ambient air about the receptacle.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,441,672	Ellis	Jan. 9, 1923
2,191,344	Erickson	Feb. 20, 1940
2,223,581	Stebbins	Dec. 3, 1940
2,356,779	Morrison	Aug. 29, 1944