

July 21, 1942.

F. C. LOWELL
REFRIGERATED DISPLAY CASE

2,290,647

Filed Feb. 12, 1941

2 Sheets-Sheet 1

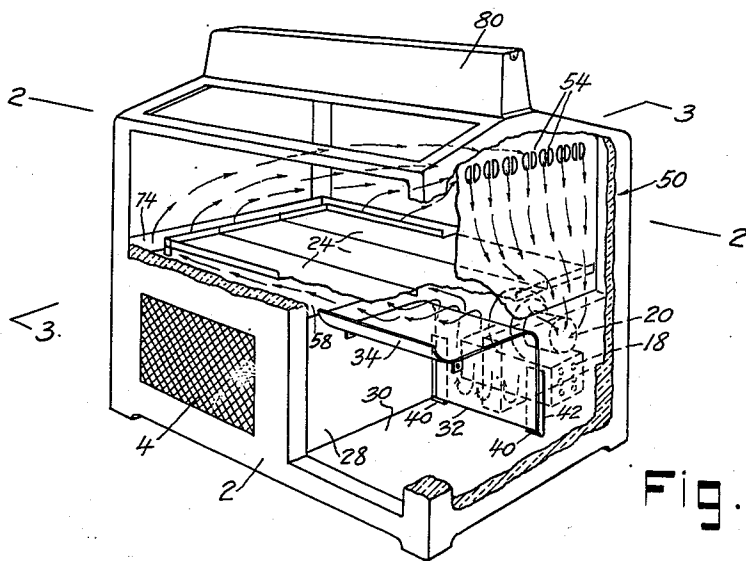


Fig. 1.

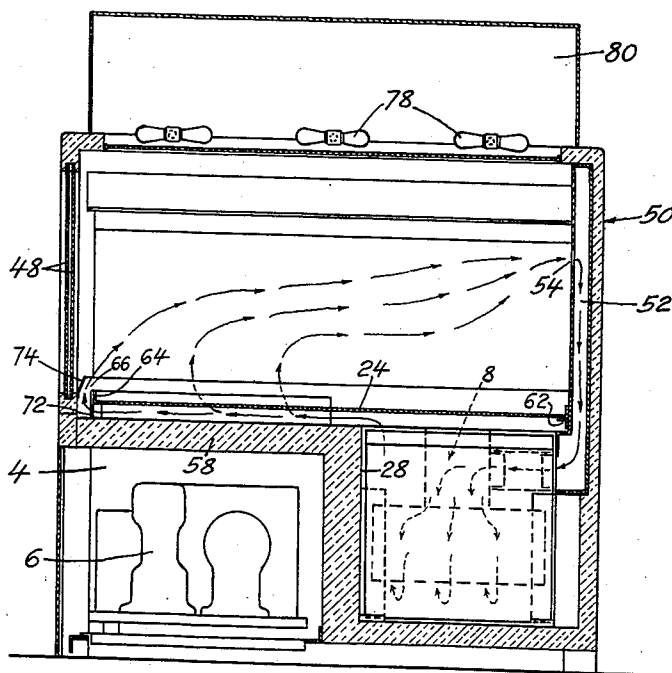


Fig. 2.

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2 Sheets-Sheet 2

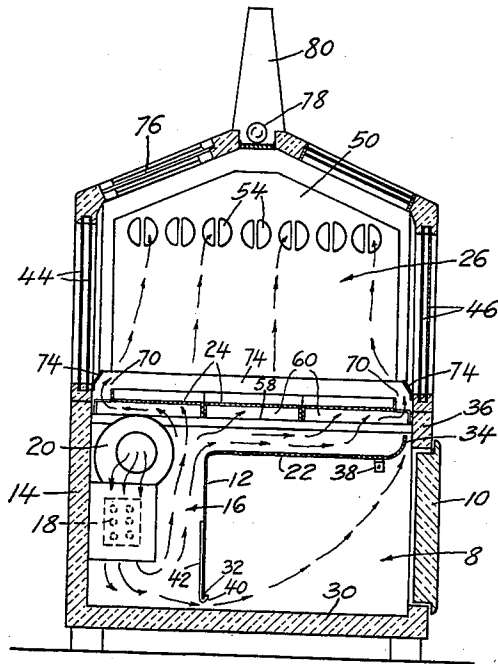


Fig. 3.

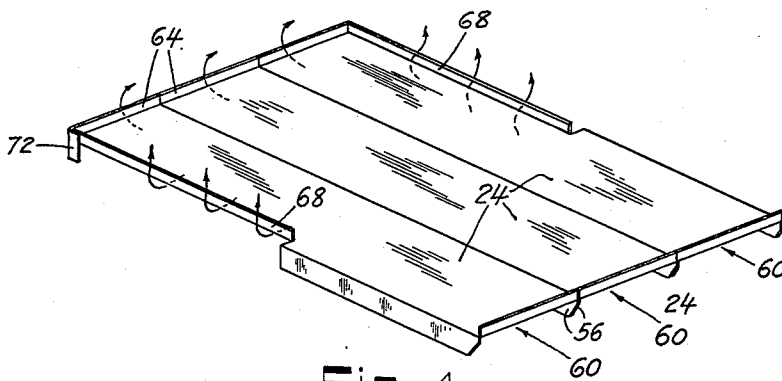


Fig. 4.

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UNITED STATES PATENT OFFICE

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REFRIGERATED DISPLAY CASE

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Application February 12, 1941, Serial No. 378,503

5 Claims. (Cl. 62—89.5)

This invention relates to refrigerated display cases adapted for the preservation and display of dairy products.

Numerous types of display cases for dairy products are known in which refrigerated air is circulated through a display chamber and withdrawn from the chamber through a centrally located duct. However such constructions are objectionable because the display chamber may be so filled with articles as to obstruct the flow of air through the central duct in the chamber. Moreover, the provision of a duct located centrally within the display chamber restricts the available storage space and is unattractive in appearance.

In accordance with the present invention, these objections to constructions of the prior art are overcome and a display case provided in which uniform cooling of the products is effected, while the storage space is unobstructed by the air circulating ducts. Another feature of the invention resides in novel means for controlling the temperature to which a storage chamber is cooled.

One of the objects of the present invention is to provide a novel type of refrigerated display case for dairy products.

Another object of the invention is to provide a refrigerated display case for dairy products with a display space therein through which air is circulated and which at the same time presents an unobstructed surface for receiving the goods to be preserved and displayed.

A further object of the invention is to provide a refrigerated display case for dairy products in which refrigerated air is circulated in a manner to maintain substantial uniformity in the cooling effect of the circulated air.

Another object of the present invention is to provide a novel type of storage chamber within a refrigerated display case.

These and other objects and features of the invention will appear from the following description thereof in which reference is made to the figures of the accompanying drawings.

In the drawings:

Fig. 1 is a diagrammatic perspective of a refrigerated display case embodying the present invention with parts thereof broken away to show the construction more clearly.

Fig. 2 is a longitudinal vertical sectional view through the display case of Fig. 1 taken on the line 2—2.

Fig. 3 is a transverse vertical sectional view through the construction illustrated in Fig. 1 taken on the line 3—3 thereof, and

Fig. 4 is a perspective illustrating the shelves which support the articles in the display chamber.

In that form of the invention illustrated in the figures of the drawings, the display case is provided with a base 2 having a ventilated chamber 4 therein in which the compressor and motor 6 for the refrigerating system are located. A storage chamber 8 is also located within the base and is provided with a door 10 which closes the front of the storage chamber. The rear wall 12 of the storage chamber 8 is spaced from the rear insulated wall 14 of the base to provide a coil chamber 16 within which is located a cooling coil 18 and a fan or blower 20 for circulating air downward over the cooling coil. The refrigerated air from the coil 18 circulates upward through the coil chamber 16 adjacent the rear wall 12 of the storage chamber spreading out above the blower and top wall 22 of the storage chamber and thence passes longitudinally of the case beneath the supporting shelves 24 in the bottom of the display chamber 26 in the upper portion of the case.

In order to insure proper cooling and the circulation of air through the storage chamber 8 the top wall 22 and rear wall 12 of the storage chamber are formed as a unit and are movable relative to the side walls and the bottom 30 of the storage chamber. The lower edge 32 of the rear wall 12 is spaced from the bottom 30 whereas the front edge 34 of the top is spaced from the insulated front wall 36 of the case to permit air to pass from the coil chamber into and out of the storage chamber for cooling the articles stored therein. The top and rear walls of the storage chamber are supported by the pivot member 38 and are held in position by the upturned flanges 40 on the members 42 which are adjustably mounted on the side walls 28 adjacent the rear wall 12 to space the edge 32 from the bottom of the chamber. In this way the volume of cooled air circulated through the storage chamber may be controlled to vary the temperature for any particular conditions of storage.

The upper portion of the case is provided with the display chamber indicated generally at 26 and provided with multiple glass panes which extend about the opposite sides 44 and 46 of the case and across the end 48 thereof. In this way the display chamber provides for inspection from both sides and one end thereof so that the articles on display may be effectively observed.

The opposite end of the display chamber is closed by an end member 50 which is provided

with a vertical air duct 52 that communicates with the upper portion of the display chamber through the openings 54 and communicates at its lower end with the intake side of the blower 20. Thus, on operation of the blower air is drawn into the duct 52 from the upper portion of the display chamber through the openings 54 and passes downward therethrough to the blower 20 and then over the cooling coil 18 and upward through the coil chamber 16. From the coil chamber the air flows through and about the storage chamber 8 and then flows longitudinally of the case beneath the article supporting shelves 24 to the opposite end of the display chamber.

The articles to be preserved and displayed within the upper display portion of the case are supported upon supports which as shown at 24, are in the form of three separate but adjacent shelves each extending substantially the whole length of the display chamber near the bottom thereof and presenting unobstructed upper surfaces. The shelves are formed with downwardly turned marginal flanges 56 which rest upon the insulated partition 58 which separates the compressor chamber 4 from the upper portion of the case. These flanges cooperate to provide longitudinally extending air ducts 60 beneath the upper supporting surfaces of the shelves. The ducts serve to conduct the cooled air passing upward from the coil chamber 16 and the storage chamber 8 to the opposite glazed end 48 of the display chamber. The ends of the shelves adjacent the closed end 50 of the display chamber are supported on brackets 62 while the opposite ends of the shelves are formed with upwardly turned flanges 64 spaced from the end 48 of the display chamber so that air passing longitudinally beneath the shelves may pass upward through the passage 66 into the display chamber and thence flow through the chamber to the openings 54 which communicate with the air duct 52 in the opposite end wall in the case. The marginal edges of outer shelves 24 which are adjacent the sides 44 and 46 of the display chamber are formed with upwardly turned flanges 68 which provide air passages 70 at the sides of the case. The inner surface of the side and end walls adjacent the air passages 66 and 70 are provided with inwardly inclined deflectors 74 which serve to direct cold air flowing upward into the display chamber away from the glass panes about the sides and end of the case and toward the articles supported on the shelves. These deflectors cooperate with the air passages 66 and 70 to insure substantially uniform cooling of the products being preserved and supported on the shelves. The corners of the marginal shelves 24 are supported on legs 72 whereas the centrally located shelf is supported throughout its length by the downwardly turned flanges 56.

Access to the display chamber is provided through the sliding doors 76 mounted on the inclined top portions of the case and the case is provided with lighting elements 78 which are located within the sign 80 at the top of the case.

The display case illustrated is simple in construction and neat in appearance. It provides the maximum storage and display space and presents supporting shelves which are unobstructed by upwardly extending elements of the air circulating system. Moreover even when the display space is filled substantially to the top, as frequently occurs when the case is used in a self-service store, the flow of air about the articles and through the air passages 66 and 70 and

the openings 54 is unobstructed and consistent uniform cooling of the articles preserved and displayed is assured.

While that form of the invention shown in the drawings and described above is preferred and has proven to be efficient in operation, it will be understood that numerous changes and modifications may be made in the form and construction of refrigerated display cases embodying the invention and therefore it is not intended that the invention should be limited except by the following claims.

I claim:

1. A refrigerated display case having a display chamber in the upper portion thereof, a storage chamber in the base of the case, means forming a coil chamber adjacent the storage chamber, a refrigerating coil and blower in said coil chamber, supporting means located near the bottom of the display chamber and extending over the coil chamber, means forming air ducts extending from said coil chamber across the lower surface of said supporting means to the display chamber near one end thereof and means located at the other end of said display chamber communicating with the upper portion of the display chamber and with said blower to draw air from the upper portion of the display chamber and cause it to be directed over the coil and into heat exchanging relation with the storage chamber and said supporting means and then to pass longitudinally through the display chamber.
2. A refrigerated case having a storage chamber therein, a refrigerating chamber, a refrigerating coil in said refrigerating chamber, means for circulating air over said coil and through the refrigerating chamber and means forming a wall separating said refrigerating chamber and said storage chamber, said means being movable to vary the amount of air from said refrigerating chamber which enters the storage chamber.
3. A refrigerated case having a storage chamber and a refrigerating chamber therein, means forming one wall of the storage chamber spaced from another wall of the storage chamber and movable relative thereto to provide a variable opening between said refrigerating and storage chamber, a refrigerating coil in said refrigerating chamber and a blower for circulating air over said coil and into said storage chamber through said variable opening.
4. A refrigerated display case for dairy products and the like comprising a base portion with a storage chamber therein and an upper portion forming a display chamber, a refrigerating coil located in said base portion, means forming a wall of said storage chamber separating said storage chamber from said refrigerating coil, said means being spaced from an adjacent wall of the storage chamber to form an air inlet, a blower for forcing air over said refrigerating coil and through said air inlet to said storage chamber, means forming an air duct entirely external of said storage chamber for conducting air from said refrigerating coil to said display chamber, and means forming an air outlet for said storage chamber communicating with said duct in advance of said refrigerating chamber whereby a portion only of the air passed over said refrigerating coil is circulated through the storage chamber and all of said air is circulated through the display chamber.
5. A refrigerated display case for dairy products and the like comprising a base portion having a storage chamber therein and an upper por-

tion forming a display chamber, a refrigerating chamber located adjacent a wall of said storage chamber and in heat transferring relation therewith, a refrigerating coil located in said refrigerating chamber, a blower for forcing air through said refrigerating chamber and over said refrigerating coil, and means forming an air duct for conducting air over said wall of said storage

5 chamber to cool the same and extending to said display chamber, and other means forming a return air duct communicating with the upper portion of said display chamber and said blower for returning air from the display chamber to said refrigerating chamber.

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