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REFRIGERATING APPARATUS

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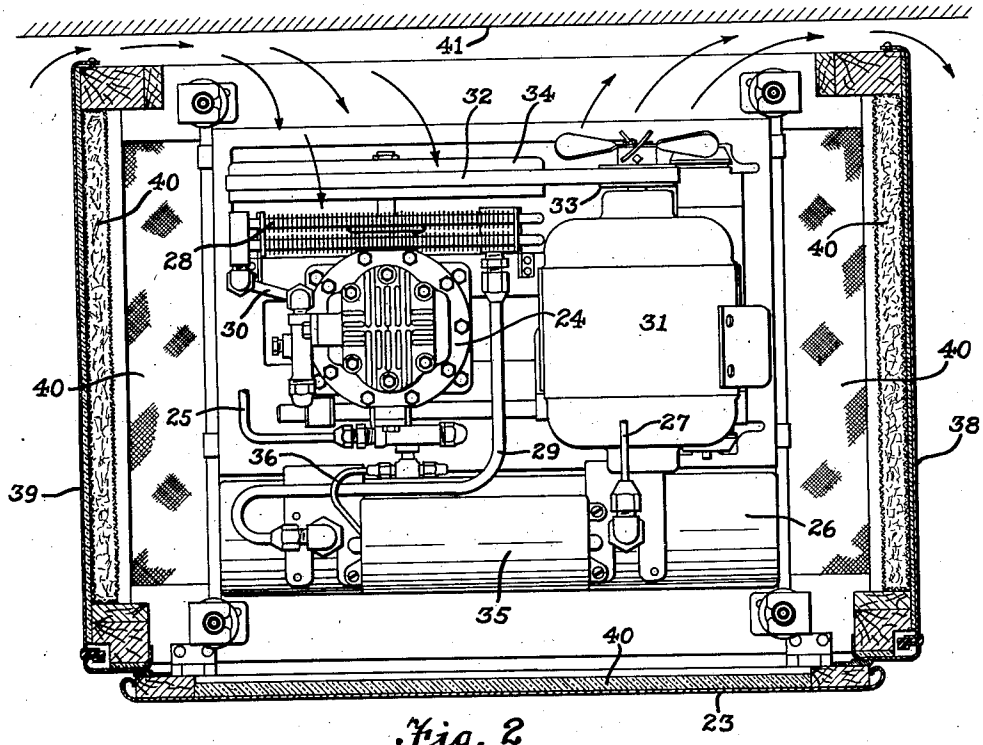


Fig. 2

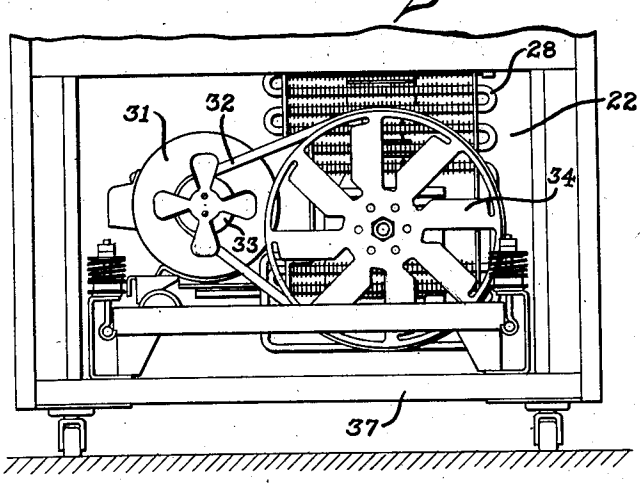


Fig. 3

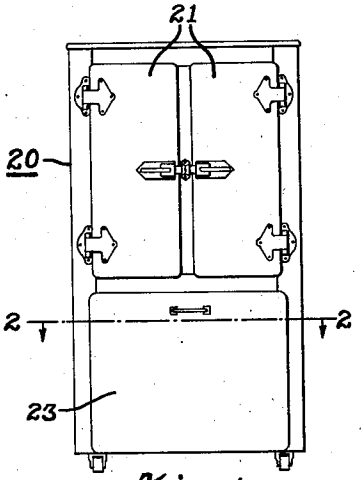


Fig. 1

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REFRIGERATING APPARATUS

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9 Claims. (Cl. 62—115)

The present invention relates to refrigerators and particularly to that type of refrigerator in which an air cooled mechanical refrigerating unit is located within a cabinet or compartment.

One of the objects of the present invention is to provide an improved compact refrigerating mechanism of the type which is disposed within a compartment or cabinet and which is cooled by the circulation of air; and more particularly it is an object of the present invention to insure the free circulation of air about the refrigerating mechanism, which is enclosed within a compartment of the type in which one wall only is open thru which the air is taken in and expelled.

My invention further contemplates the provision of a plurality of air circulating means, such as fans, disposed adjacent the open end of the compartment, one fan being arranged for primarily drawing air into the compartment and the other fan being arranged to expel the air thru the open end of the compartment and to intensify the circulation thru the compartment.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred form of the invention is clearly shown.

In the drawing:

Fig. 1 is a front view of a refrigerator cabinet showing the type of cabinet to which my improved refrigerating apparatus may be applied.

Fig. 2 is an enlarged sectional view of the cabinet taken on the line 2—2 of Fig. 1 showing the improved refrigerating unit disposed within a compartment of the cabinet.

Fig. 3 is a rear view of the lower portion of the refrigerator cabinet.

Referring to the drawing, 20 designates a refrigerator cabinet having a food compartment, a cooling compartment and a cooling unit therein (not shown). Doors 21 provided on the cabinet 20 afford access to the compartments and cooling unit which may be of the usual construction. A compartment 22 adapted to contain a mechanical refrigerating unit is provided in the lower portion of the cabinet 20 and has its front wall closed by a door 23. The cooling unit is connected with a compressor 24 by pipe 25, and connected with a receiver 26 by pipe 27. The receiver 26 is adapted to receive liquid refrigerant from a condenser 28 thru a pipe 29. The high pressure side of the compressor 24 is connected by pipe 30 with the condenser, thus completing a closed refrigerant-medium-circuit. Compressor 24 is driven by an electric motor 31 thru belt-and-pulley connections 32, 33 and 34. A switch 35 is connected by a pipe 36 with the crank case of compressor 24 and is responsive to pressures therein for starting and stopping the unit.

The bottom of the machine compartment 22 is provided with a base 37 to which brackets are secured. These brackets support springs from which the mechanical unit is suspended within the compartment. The exterior walls of the cabinet provide walls 38 and 39 for the machine compartment while the door 23 provides a closed front wall. The back of the compartment 22 is open to provide for the ingress and egress of air. The front, bottom and side walls of the machine compartment are lined with sound absorbing pads 40 which may be of any suitable porous fiber structure.

When the mechanical unit operates to cause refrigerant to be withdrawn from the cooling unit or evaporator and forced at a higher pressure to the condenser 28, the compressor pulley 34, which is of the fan type, causes air to enter the compartment 22. Since refrigerators are usually placed adjacent a wall 41 (see Fig. 2) of a room and spaced therefrom by base boards or other moulding secured to the wall, air enters the compartment 22 thru the space between the refrigerator cabinet 20 and the wall 41 as indicated by the arrows. This air is circulated by the pulley 34 over the condenser 28 and compressor 24 to the front of compartment 22. A relatively high speed fan 43 mounted on the shaft of driving motor 31 then picks up the air and forces it from the compartment in a direction indicated by the arrows. It is apparent that the circulation within the compartment causes a flow of air parallel with the walls thereof. The sound absorbing pads 40 with which the walls are lined absorb noises created by the unit and prevents them from entering the room.

When mounting a compact refrigerating unit, of the type disclosed in a compartment, having one wall only open for air circulation, I have found that by the use of an air circulating means in addition to the means mounted on the compressor adjacent the condenser, pocketing of air within the compartment is eliminated and circulation thru the compartment is materially intensified. This increased circulation of cooling air permits the use of a small compact condenser whereas a large and more expensive condenser would be necessary to maintain the efficiency of the refrigerating system.

Heretofore mechanically refrigerated cabinets were usually provided with louvered or perforat-

ed front or side walls to permit the circulation of cooling air thru the compartment containing the refrigerating unit. Dirt or dust circulated by the air collects on these louvers and necessitates frequent cleaning thereof which cleaning is both a gruesome and difficult task. An advantage derived from the provision of efficient air circulation within compartments having one wall only open for the ingress and egress of cooling air is that refrigerator cabinets may be provided with neat appearing solid front and side walls.

The provision of non-perforated side walls for the unit compartment also improves the exterior appearance of refrigerator cabinets. An advantage derived from my improvement is that I provide for adequate cooling of the refrigerating unit enclosed within a cabinet having solid front and side walls. The two fans as arranged direct circulating air about the parts to be cooled and insure adequate air circulation within the compartment.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A refrigerating apparatus comprising in combination, a compartment having one side only open, a compressor and a motor disposed within said compartment, said motor being located at the side of said compressor, a fan on the compressor for circulating air in through the open side of said compartment and over said compressor and motor, a condenser between the fan and compressor, and means operated by the motor for intensifying the circulation of air over the condenser and out of said compartment.

2. In combination, a compartment open at one end only, a refrigerating unit including a motor and compressor within the compartment, a fan on the compressor for drawing air into said compartment through the open end, and means operated by the motor for expelling air from said compartment through the open end.

3. In combination, a compartment open at one end only, a motor, a compressor, and a condenser within the compartment, means on the compressor for circulating air in through the open end and over the condenser, and means operated by the motor for expelling air from said compartment through said open end, said last means cooperating with the first means to intensify the circulation.

4. A refrigerating apparatus comprising in combination, a compartment closed on three sides by walls, one side being open, a motor, a compressor and condenser within the compartment, a slow speed fan mounted on the compressor adjacent the condenser for circulating air within the compartment, a high speed fan operated by the motor for intensifying the circulation of air, said fans drawing air into and expelling same through said open side of said compartment.

5. In combination, a compartment closed on three sides by walls, one side being open, sound absorbing material on said walls, a motor, a compressor and a condenser within the compartment, a slow speed fan for circulating air within the compartment, a high speed fan operated by the motor for intensifying the circulation of air, said fans drawing air into and expelling same through said open side of said compartment.

6. In combination, a compartment open at one end only, a motor and a compressor within the compartment, a belt and pulley driving connection for said compressor, a fan on said pulley for circulating air into the compartment through the open end, a second fan for circulating air out of the compartment through the open end, a condenser mounted between the compressor and its driving pulley, said condenser being disposed in the path of air circulated by said fans.

7. A refrigerating apparatus comprising in combination, a compartment having only one side open, a compressor element, an element for operating said compressor element, and a condenser all disposed within said compartment, means on one of said elements for circulating air in through said open side of the compartment and over the condenser, and means operated by the other of said elements and cooperating with said first named means to intensify the circulation of air over the condenser through the open side of said compartment.

8. A refrigerating apparatus comprising in combination, a compartment having an opening in one wall thereof, said compartment also having a closed wall directly opposite the wall having the opening therein, a compressor element, an element for operating said compressor element, and a condenser all disposed within said compartment, means operable by one of said elements for circulating air through the opening in said compartment wall and over the condenser, and means operated by the other of said elements and cooperating with said first named means to intensify the circulation of air over the condenser through the opening in the compartment wall.

9. A refrigerating apparatus comprising in combination, a compartment having an opening in one wall thereof, said compartment also having a closed wall directly opposite the wall having the opening therein, a compressor, a motor for operating said compressor, and a condenser all disposed within said compartment, a fan operable by said compressor for circulating air through the opening in said compartment wall and over the condenser, and a second fan operated by said motor and cooperating with said first named fan to intensify the circulation of air over the condenser through the opening in the compartment wall.

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