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COUNTER COOLING MEANS

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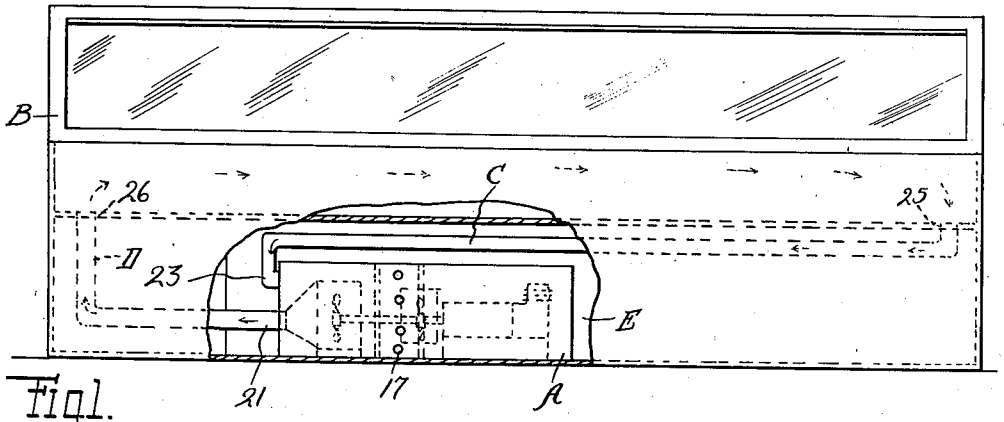


Fig 1.

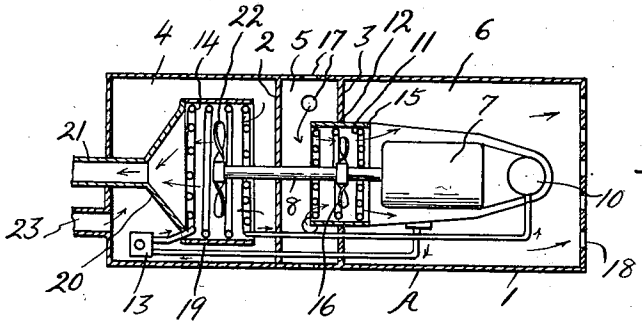


Fig 2.

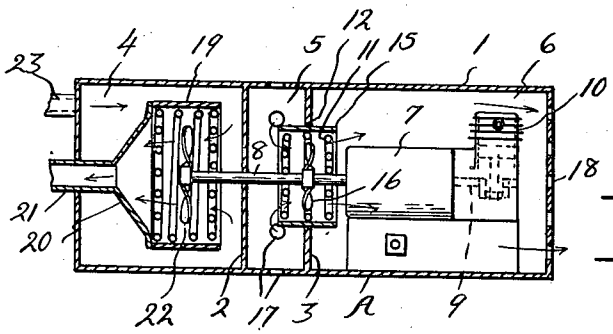


Fig 3.

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COUNTER COOLING MEANS

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6 Claims. (Cl. 62—102)

This invention relates generally to air refrigerating and circulating means for compartments such as display counters, show cases and the like, and consists of certain novel features of construction, combinations and arrangements of parts that will be hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying drawing:

Figure 1 is a diagrammatic view of an assembly embodying my invention;

Figure 2 is a horizontal sectional view through the refrigerating apparatus;

Figure 3 is a vertical sectional view through the construction illustrated in Figure 2.

Referring now to the drawing, A is a refrigerating apparatus or cooling unit embodying my invention, B is a display counter case adapted to be cooled by air refrigerated by the apparatus A, C is a flexible conduit for conducting air from the counter B to the apparatus A to be refrigerated, and D is a flexible conduit for conducting refrigerated air from the apparatus A to the counter B. As shown, the apparatus A is in a chamber E below the counter, however the conduits C and D may be any length desired and the refrigerating apparatus may therefore be located in any convenient place relative to the counter or other compartment to be cooled.

Referring in detail to the apparatus A, 1 is an elongated casing divided longitudinally by two transversely extending partitions 2 and 3 respectively into three chambers 4, 5 and 6 respectively. 7 is an electric motor in the chamber 6 and provided at opposite ends with shafts 8 and 9. 10 is a pump in the chamber 6, preferably at one end of the motor 7 and adapted to be driven by the shaft 9 thereof to compress a suitable refrigerant. 11 are condenser coils within an opening 12 in the partition 3 between the chambers 5 and 6 and adapted to receive the compressed refrigerant from the pump 10. 13 is an expansion valve in the chamber 4 and adapted to receive the refrigerant from the condenser 11, and 14 are cooling coils within the chamber 4 and adapted to receive the refrigerant from the valve 13. 15 is a tubular shell for the condenser coils 11 extending through the opening 12 and arranged substantially concentric with the motor shaft 8, 16 is a fan rigid with the shaft 8 within the shell 15 and having the blades thereof shaped so as to draw air from openings 17 in the side walls of the chamber 5 through the shell 15 into the chamber 6 where it is permitted to escape through openings 18 in the rear end of the casing. 19 is a tubular shell for the cooling coils 14 and arranged concentric with the shaft 8. A shroud 20 projects from the forward end of the shell 19 and has the reduced portion 21 projecting through the forward end of the casing, while a fan 22 is rigid with the shaft 8 within the shell 19 and has the blades thereof shaped to draw air inwardly from the inlet 23 in the forward end of the casing through the shell 19 into the shroud 20.

When installed the conduit C extends through an opening 25 in the display counter and is connected to the inlet 23 of the elongated casing, while the conduit D is connected to the outlet end 21 of the shroud 20 and extends through an opening 26 in the display counter. Thus rotation of the fan 22 causes air in the counter to be drawn through the conduit C into the chamber 4 and shell 19 where it is refrigerated by the cooling coils 14. Such rotation of the fan 22 also causes the refrigerated air in the shell to be forced through the shroud 20 and conduit D into the counter. Hence food, candy, etc., in the counter will be maintained in a cool and refrigerated condition.

Thus from the foregoing description it will be apparent that a simple but very efficient means has been provided for creating and maintaining a forced circulation of refrigerated air wherever desired. The construction is such that the apparatus may be mounted at any convenient place relative to the chamber or compartment to be cooled and enables the entire counter or show case to be refrigerated from a remote point by forced air circulation instead of by the usual convection currents. Thus it will be apparent that the forced air circulation will cause a greater and faster heat transfer than heretofore. It will also be noted that the condenser 11, pump 10 and motor 7 are cooled by air drawn in through the openings 17 by the fan 16 and such air is prevented from mixing with the refrigerated air by the partition 2 in the casing. Moreover, both fans 16 and 22 and the pump 10 are operated by a single motor. If desired the apparatus may also be used to cool a refrigerator. For example, the apparatus could be mounted in the bottom of the refrigerator and could be removed as a unit by simply disconnecting the two air conduits C and D from the inlet 23 and shroud 20. Moreover by constructing an insulating compartment for ice trays and locating such compartment inside the cooling coils 14 at one side of the fan 22, the apparatus above described could be used to freeze ice cubes.

While it is believed that from the foregoing description the nature and advantages of the in-

vention will be readily apparent, we desire to have it understood that we do not limit ourselves to what is herein shown and described, and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What we claim as our invention is:

1. In an assembly of the class described, a casing divided by a plurality of partitions into several compartments, a condenser in communication with two of said compartments, a fan adapted to draw air through openings in one of said two mentioned compartments to cool said condenser, a cooling unit in another compartment, and a fan in said last mentioned compartment adapted to draw air from a different source to be cooled by the cooling unit.

2. In an assembly of the class described, a casing having three chambers, a tubular member extending between two of said chambers, a refrigerant condenser in said tubular member, one of the two said chambers having an opening establishing communication with the atmosphere, a refrigerant expansion means in the third chamber, means within the tubular member for drawing air from the atmosphere through the opening aforesaid and through the condenser, and means within the third chamber for circulating air from a different source through and about the expansion means aforesaid, said third chamber being isolated from the two said chambers aforesaid whereby the air circulated within the third chamber is prevented from commingling with air circulated within the two other chambers.

3. In an assembly of the class described, a casing having three chambers arranged end to end, the intermediate chamber having an opening establishing communication with the atmosphere and being in communication with one of the end chambers, said end chamber having openings establishing communication with the atmosphere. a refrigerant condenser extending between the intermediate and end chamber aforesaid, and the third chamber being isolated from the two chambers aforesaid, a refrigerant expansion means within the third chamber, means for conducting air from another source to and from the third chamber, means for drawing air from the atmosphere into the intermediate chamber through the condenser, means for creating a circulation of air about the expansion means, and a common source of power for the last two mentioned means.

4. In an assembly of the class described, a casing containing a partition dividing said casing into a machine compartment and a cooling unit compartment, an electric motor within the machine compartment, a shaft driven by the motor and extending through the partition, a refrigerant compressor operable by said motor, a condenser in communication with the compressor, said condenser and compressor being located within the machine compartment, a cooling unit in communication with the compressor and located within the cooling unit compartment, and two fans driven by said motor, one of said fans being upon one side of said partition and adapted to circulate air about the condenser, and the other of said fans being upon the opposite side of said partition and adapted to circulate air about the cooling unit.

5. In an assembly of the class described, a refrigerant condenser, a refrigerant cooling unit adjacent the condenser, a refrigerant compressor in communication with said condenser and cooling unit, an electric motor for driving said compressor and having a shaft extending transversely of said condenser and cooling unit, an enclosure for the condenser, motor and compressor including a partition between said condenser and cooling unit, said enclosure having openings therein adjacent the condenser and compressor, fans on the motor shaft, one of said fans being adapted to draw air from the atmosphere through the opening in the enclosure adjacent the condenser and to circulate such air about the condenser, motor and compressor to the opening in the enclosure adjacent the compressor, another of said fans being adapted to circulate air about the cooling unit, and a conduit associated with said cooling unit for receiving the air circulated by the last mentioned fan.

6. A universally connectible refrigerating unit comprising an enclosing casing a refrigerant compressor, condenser and evaporator therein, flexible inlet and outlet conduit means extending therefrom to afford convenient connections with any compartment to be cooled, and means for circulating air through said conduit means.

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