

April 19, 1955

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2,706,387

CONDENSATION CONTROL ON THE OUTSIDE OF REFRIGERATED CABINETS

Filed March 2, 1953

2 Sheets-Sheet 1

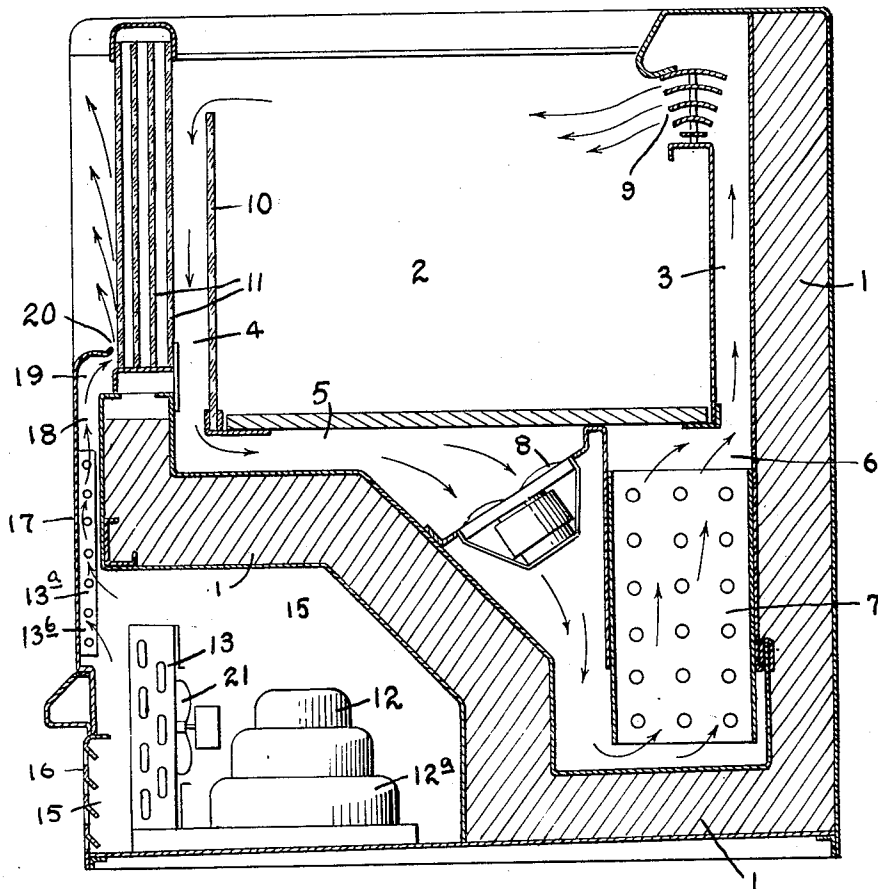


Fig. 1.

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2 Sheets-Sheet 2

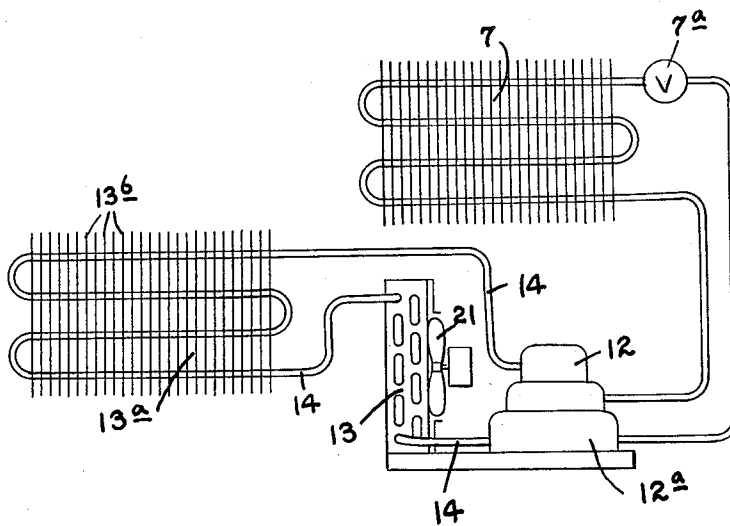


Fig. 2.

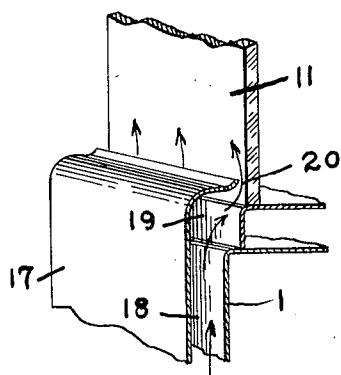


Fig. 3.

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CONDENSATION CONTROL ON THE OUTSIDE
OF REFRIGERATED CABINETS

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Application March 2, 1953, Serial No. 339,795

2 Claims. (Cl. 62—117.4)

This invention relates to the elimination of condensation of moisture in the air on the exterior of refrigerated cabinets, and it is particularly useful with commercial display cabinets in which the interior temperature is very low, and notwithstanding good insulation in the walls of the cabinet, there is enough heat transfer therethrough to cool the exterior and condense the moisture in the exterior air on the exterior surface. This is particularly objectionable when it occurs on the fronts of the cabinets, which are frequently contacted by purchasers who select goods for sale from the cabinets.

The object of this invention is to prevent or eliminate such exterior condensation by circulating the warm air dissipated from the condenser of the refrigerating mechanism against the exterior, and particularly the front side of the cabinet keeping it sufficiently warm so that the moisture will not condense on it. This is accomplished without the use of additional heating or circulating means than is ordinarily used in the conventional refrigerating system.

The invention is hereafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings in which:

Fig. 1 is a front-to-rear vertical section, partly in diagrammatic form, of a refrigerated cabinet showing this invention applied thereto.

Fig. 2 is a diagrammatic illustration of the refrigerating mechanism used to cool the cabinet, and

Fig. 3 is an enlarged fragmentary perspective view of a portion of the cabinet showing a part of the warm air passage.

Like reference numbers apply to like parts in all of the figures.

The cabinet shown is of the open top "reach in" type and has a main body 1 in which is located the refrigerated compartment 2 in which refrigerated merchandise is kept for display and sale. The body 1 has insulated walls spaced from the compartment 2 providing the passages 3, 4 and 5, and the cooling chamber 6 in which is located the evaporator 7 of the refrigerating mechanism.

The air for refrigerating the compartment 2 is circulated by a fan 8 which blows the air through and past the evaporator 7 where it is cooled, thence upwardly through the passage 3 from where it is directed by the vanes 9 to pass across the open top of the compartment 2. The cool air then passes downward through the passage 4 between the front 10 of the compartment and the multiple glass wall 11 which forms the transparent insulated front of the upper part of the cabinet. The front 10 of the compartment may be of glass for transparency, or it and the wall 11 may be of non-transparent material so far as this invention is concerned.

The aforesaid construction and air circulation are conventional and the refrigerating mechanism is also of ordinary type consisting of a compressor 12, a condenser 13, the evaporator 7 and the necessary connecting pipes such as those 14 which connect the compressor with the condenser and the receiver 12^a which is customarily used to receive the liquefied refrigerant which flows from the condenser. A thermostatic expansion valve 7^a meters or controls the liquefied refrigerant entering the evaporator 7.

In refrigerating a space, the heat which is removed therefrom is absorbed by the refrigerant in the evaporator 7, which refrigerant is then compressed by the compressor and delivered to the condenser, which is a radiator type device from which most of the heat removed from the refrigerated compartment is dissipated. The compressor also becomes warm in operation and the heat therefrom is thrown off into the surrounding air.

This invention utilizes the heat emitted from the condenser and also from the compressor to warm the front exterior surface of the cabinet so that moisture of con-

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densation will not form thereon. The compressor 12 is located in a chamber 15 in the lower part of the cabinet. The lower part of the front of the chamber 15 is closed by a vented plate 16 which provides air circulation and above that is a front plate 17 spaced from the front of the cabinet to form a passage 18.

The passage 18 communicates at its lower end with the chamber 15 and at its upper end it joins the chamber 19 which extends substantially the full width of the cabinet. The chamber 19 has an upper wall which terminates a short distance from the front or outer side of the wall 11, forming an elongated narrow outlet passage 20 adjacent said wall 11.

The condenser 13 is a radiator type device comprising a coil of tubing through which the compressed warm refrigerant flows and air from the chamber 15 circulates around the coil absorbing heat therefrom. A fan 21 may be used to induce the air circulation around the condenser or such circulation may be caused by gravity flow entirely.

In the present invention the condenser 13, or a part 13^a of the condenser, is located in the passage 18. The drawings show the condenser 13 as having a branch part 13^a which is located in the passage 18 but it is conceived that the condenser may be a unitary part, all of which is located in said passage.

As before described, the condenser comprises a tubular coil having heat conducting and radiating fins 13^b, and that part of the condenser which is located in the passage 18 has its fins 13^b located against the front plate 17 so that the heat thrown off from the refrigerant in the tubes will be more efficiently conducted to the front of the cabinet while these fins do not contact the insulated part of the cabinet which forms the inner wall of the passage.

In operation, assuming that the condenser as a single unit is located in the passage 18, then all of the heat emitted therefrom will be either conducted to the front plate 17 by conduction through the fins 13^b or will be carried upward by convection due to the gravity flow of the air, and will flow into the chamber 19 and out through the passage 20 against the outer surface of the upper wall 11.

If the condenser is in two parts 13 and 13^b, with the part 13^b located in the passage 18, then the part 13^b will dissipate its heat as above described, while the part 13 will throw off its heat into the chamber 15 from where it will flow, either entirely by gravity, or augmented by the fan 21 if such fan is used, and will pass upward through the passages 18 and 19 increasing the warming effect on the front of the cabinet.

In most cases the heat emitted by the condenser of the refrigerating machinery, when properly directed to the front of the cabinet, will be sufficient to warm said front to a temperature where moisture will not collect thereon without the use of additional or extraneous sources of heat for that purpose.

The invention is defined in the appended claims, which are to be considered as comprehensive of all forms coming within their scope.

I claim:

1. The combination with a refrigerated cabinet having a substantially vertical outer front side wall, a chamber in its lower portion and a refrigerating mechanism having a two part condenser, one part of which is located in said chamber, of a passage communicating with said chamber, said outer front side wall of said cabinet forming the outer front wall of said passage, the other part of said condenser being located in said passage and an outlet opening at the upper part of said passage.

2. The elements of claim 1 in which said part of the condenser within said passage has parts in heat-conducting contact with said outer wall.

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