

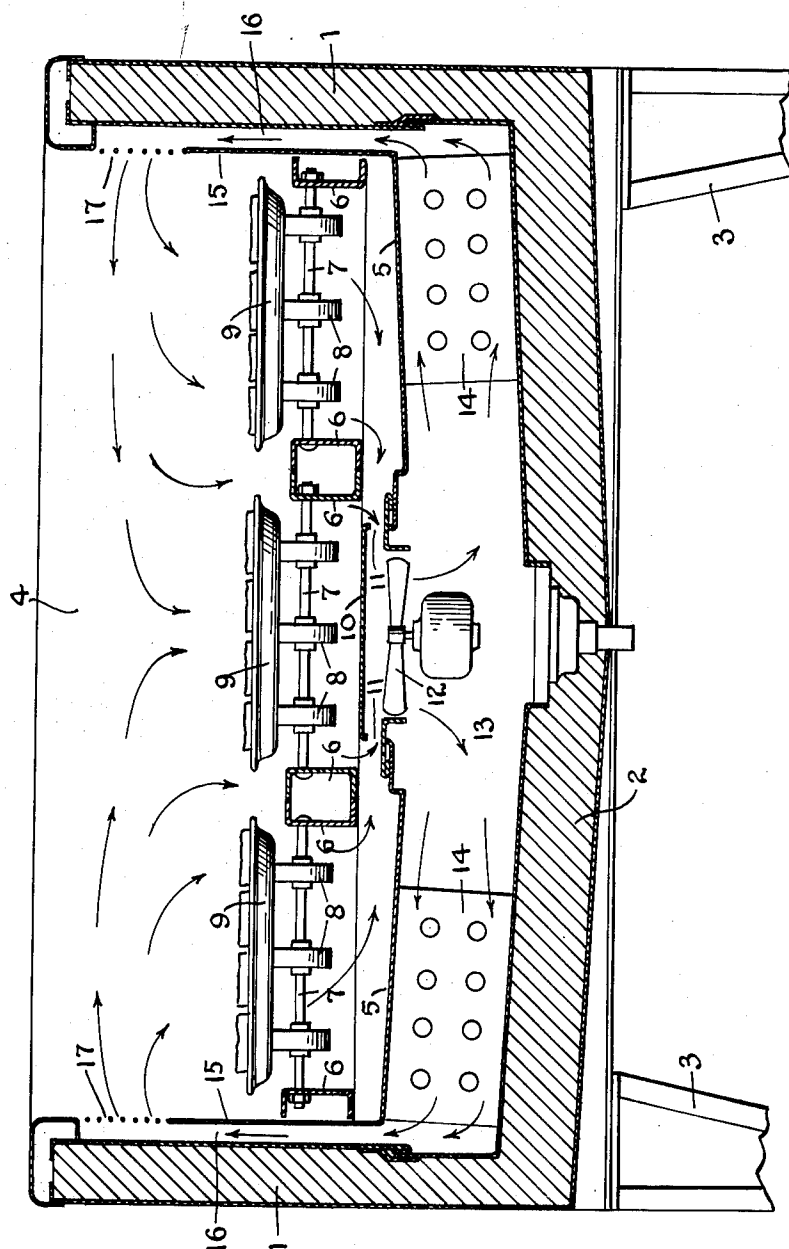
Jan. 31, 1956

C. B. SHREVE

2,732,689

REFRIGERATED DISPLAY CABINET

Filed April 15, 1953



Inventor
Clifford B. Shreve
By *Karol O. Van Antwerp*
Attorney.

1

2,732,689

REFRIGERATED DISPLAY CABINET

Clifford B. Shreve, Buchanan, Mich., assignor to Tyler Refrigeration Corporation, a corporation of Michigan

Application April 15, 1953, Serial No. 348,948

1 Claim. (Cl. 62—89.5)

This invention relates to refrigerated open-top, reach-in type cabinets which are wider than usual and may contain a plurality of conveyors extending longitudinally of the cabinet and placed side by side on which goods to be cooled are placed in suitable trays or containers. These cabinets may be sectional, the sections being joined end so that goods may be placed therein and cooled and remain cold during their passage along said conveyors during which passage they may be momentarily removed for processing, such as weighing, pricing and wrapping. The invention is equally adaptable to unusually wide open top cabinets without conveyors to cool and maintain cold goods for display and sale.

The invention is particularly concerned with the circulation of refrigerated air in wide open top cabinets whereby the entire food containing space can be kept at uniform cold temperature. It has been learned that directional control of refrigerated air passing over merchandise can be controlled only over a limited distance without excessive mixing of ambient outside air and excessive warming of the air in the vicinity of the return ducts.

This invention overcomes the difficulty of circulating refrigerated air over a wide area and maintain the air at substantially uniform temperature throughout its entire travel over and around the goods to be cooled.

The invention is hereafter more fully described and particularly pointed out in the claim, reference being had to the accompanying drawing which is a transverse vertical section, partly in diagrammatic form, showing a refrigerated cabinet embodying the invention.

The cabinet has a rectangular body having sides 1 and a bottom 2, and is supported by suitable legs 3. The body may be of the desired length, usually greater than its width, and has ends corresponding to the sides 1, or if the cabinet be made up of several sections the adjacent ends of the sections are open so that the interior compartment is continuous from end to end of the assembly. The cabinet has an open top and within it is an open top refrigerated compartment 4 which has a bottom 5.

Above the bottom 5 are located three conveyors, each of which has two spaced apart side rails 6 which are supported above the bottom 5 by suitable means not shown. Such supporting means may be located at the respective ends of the side rails. Between each pair of side rails 6 are a plurality of shafts 7, each of which has mounted upon it a suitable number of conveyor rollers 8, these shafts and rollers being spaced from each other and located throughout the lengths of the side rails. These conveyors support merchandise to be cooled, which may be placed in trays 9 and moved by hand along the conveyors, or if desired, the conveyors may be power-driven so that the merchandise will move automatically along the length of the compartment.

The bottom 5 has a central raised portion 10 which has side openings 11 through which the circulated air passes, and a fan 12 is located below and adjacent the openings 11.

2

Between the bottom 5 of the compartment and the bottom 2 of the cabinet is a space extending across the entire width of the interior of the cabinet, and its central portion provides a plenum chamber 13 into which air is blown by the fan 12. At opposite sides of said space two evaporators 14 are located. These evaporators 14 are open at their respective sides and air may pass through them from the plenum chamber 13. The evaporators 14 are a part of a conventional refrigerating mechanism and receive the compressed refrigerant which evaporates within them, and in so doing absorb heat from the air as it passes through them. The remainder of such conventional refrigerating mechanism may be located elsewhere, either in the cabinet or outside it, and connected with the evaporators by conventional piping.

The vertical sides 15 of the compartment 1 are spaced inward from the sides 1 of the cabinet to provide vertical air passages 16 which communicate at their lower ends with the evaporators 14 and at their upper ends they have outlet passages 17 which communicate with the compartment 4 at opposite sides and near the top thereof.

In operation, air is drawn from the lower part of the compartment near its longitudinal center through the openings 11 by the fan 12. If the compartment 4 is of considerable length two or more fans 12 and return openings 11 may be distributed along its length. This return air which has accomplished its cooling effect upon the contents of the compartment 4, has lost considerable of its frigidity and is blown into the plenum chamber 13, wherein it assumes a slight pressure which is evenly distributed throughout said chamber.

The warmed air in the plenum chamber 13 finds its way outwardly in substantially equal flow through both of the evaporators 14 in which its temperature is reduced, and thence upwardly through the passages 16 and out through the outlets 17 into the upper part of the compartment 4 at opposite sides thereof. This flow of air leaving the outlets 17 is in a substantially horizontal direction, but as it progresses toward the center of the compartment it gradually loses its directional force and falls upon the trays 9 and their contents and then passes between, around and under the trays from where it finds its way, aided by suction of the fan 12, to the passages 11 and again into the plenum chamber 13 from where the cycle is repeated.

By this means two streams of cold air are blown from opposite sides of the compartment toward its center. Neither of the streams has enough force or directional flow to carry it entirely across a wide compartment, but each can easily carry to the center thereof and when the two streams meet at the center of the compartment their force of flow will become neutralized and the air will fall to the lower part of the compartment, aided in this movement by suction of the fan 12. It is to be understood that not all of the cold air will be blown to the center of the compartment. Portions of the streams, especially the lower strata thereof, will lose its directional flow before reaching the center and will fall downwardly between the center and sides of the compartment thus producing a uniform cooling of the compartment and its contents throughout its width.

The invention is defined in the appended claim, which is to be considered comprehensive of all forms coming within its scope.

I claim:

A refrigerated cabinet having an open topped compartment, said compartment having a bottom and opposite sides, a plenum chamber beneath said bottom near the center thereof and extending substantially the entire length of the cabinet, a restricted air inlet through said bottom into said plenum chamber and extending substantially the entire length of the cabinet, an air cooling ele-

3

ment at each side of said plenum chamber in the direction of said sides, an air-conduit leading from each of said cooling elements to the respective opposite sides of the compartment, an outlet passage from each conduit into said compartment at opposite sides and near the top thereof, a fan located to draw air from said compartment through said restricted air inlet and force it under pressure into said plenum chamber, means for supporting merchandise in said compartment spaced above the bottom thereof, said supporting means providing free pas-

5

10

4

sage of air therethrough, said supporting means being a conveyor transversable lengthwise of said compartment.

References Cited in the file of this patent

UNITED STATES PATENTS

1,729,638	Zelenka	Oct. 1, 1929
2,463,104	Hender	Mar. 1, 1949
2,584,494	Olson	Feb. 5, 1952
2,601,765	Turquette	July 1, 1952