Feb. 7, 1933. J. A. PRUDENTE ET AL 1,896,787

COOLING APPARATUS

Filed April 25, 1931

Fig. 1.

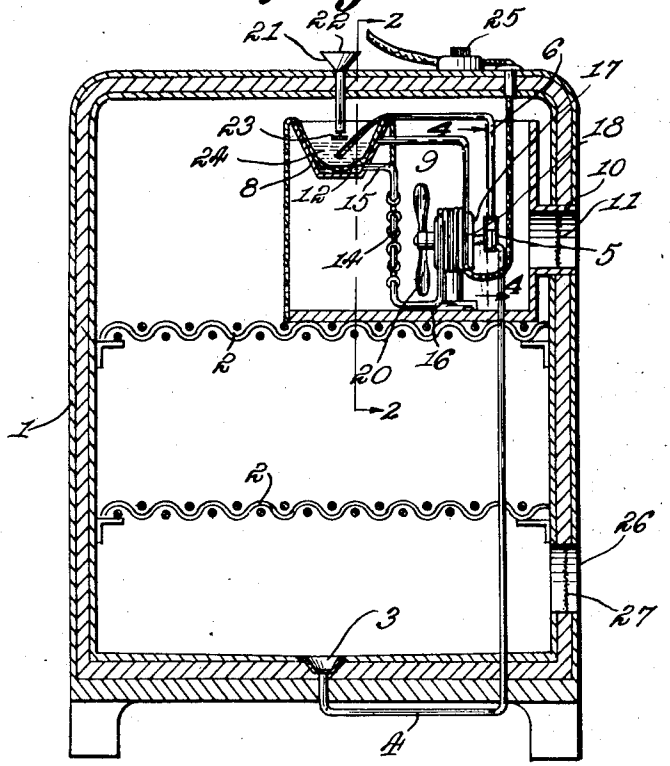


Fig. 2.

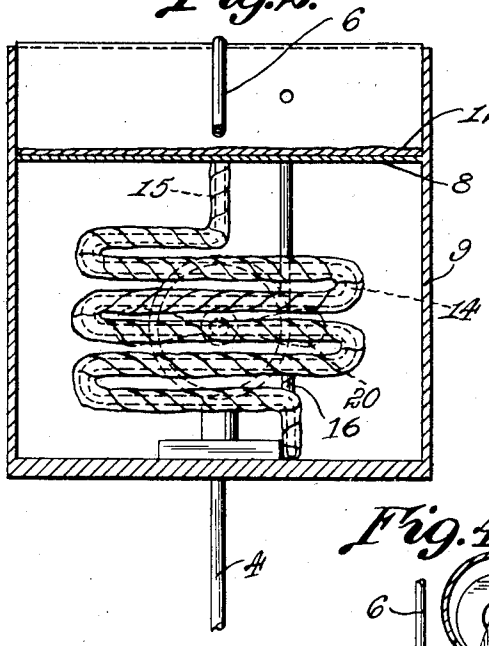


Fig. 3.

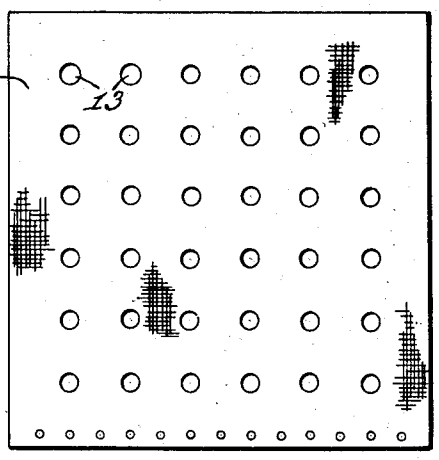
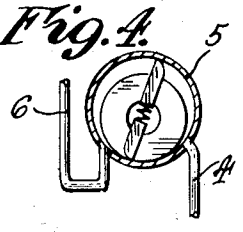


Fig. 4.



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UNITED STATES PATENT OFFICE

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COOLING APPARATUS

Application filed April 25, 1931. Serial No. 532,892.

The object of this, our present invention, is the provision of an apparatus for cooling articles of food and beverages without the use of ice.

A further object is the provision of a refrigerator that is characterized by simplicity of construction, cheapness of manufacture, economy in use and which is also sanitary and is automatic in action.

To the attainment of the foregoing the invention consists in the improvement hereinafter described and definitely claimed.

In the drawing:

Figure 1 is a substantially central vertical longitudinal sectional view through a refrigerator in accordance with this invention.

Figure 2 is a sectional view approximately on the line 2—2 of Figure 1, the same being a sectional view through the cooling unit.

Figure 3 is a face view of the cooling unit.

Figure 4 is a sectional view through the rotary pump employed and is taken on the line 4—4 of Figure 1.

The body 1 of the refrigerator is of the usual construction and the same has arranged therein brackets on which are supported the horizontal shelves 2, respectively. In the present instance all of the shelves are strong wire mesh, and the upper shelf supports thereon the cooling unit which will be presently described in detail. In the bottom of the refrigerator 1 there is a cup-like member 3 and connected to the bottom thereof and leading through the bottom of the refrigerator there is a tube 4. The tube is directed beneath the bottom of the refrigerator and is from thence extended inwardly therethrough and passes vertically through the shelves 2—2 and is connected to a casing 5 of a rotary pump. The pump is of the usual construction to include the rotary element and the spring influenced blades which are directed therethrough against the inner periphery of the round casing for the other pump. The outlet pipe 6 for the pump 5 communicates and terminates at a point adjacent to the bottom of a water containing tank or trough 8 secured to or formed at the open top of a preferably metal casing 9. The casing has not only an open top but an open front, but the closed rear wall thereof has an opening therethrough surrounded by a short pipe 10 that passes through the body of the refrigerator. The pipe 10 affords an air inlet to the casing 9 and preferably there is arranged in the pipe 10 a screen disc 11.

The open front of the casing 9 is closed by a loosely woven cloth 12. The cloth is preferably provided with a series of apertures 13 and the cloth is arranged around the side walls and bottom of the pan 8 and extends downwardly from the rear wall of the said pan and the said depending portion is wrapped around water conducting coils 14 connected by a pipe 15 to the bottom of the pan. The lower or bottom portion of the coil 15 has a pipe extension 16 which is wound or wrapped around the casing 17 of an electric motor. The wrapped portion of the pipe is indicated by the numeral 18. The pipe is from thence continued upwardly and bent angularly toward and communicates with the pan 8 adjacent to the top thereof.

The shaft 19 of the motor 17 operates the rotary pump and likewise operates fan blades 20 disposed directly to the rear of the cloth wrapped coil 14. Water is delivered into the pan 8 through the spout of the funnel 21 arranged on the top of the refrigerator box, and preferably but not necessarily there is passed through the funnel and its spout a stem 22 that carries on its lower end a float valve 23. The float valve is designed to rest upon the body of water 24 which is poured in the pan through the funnel. The conductors for the motor 17 are connected to a hand operated switch 25, which can be connected to any convenient source of current.

The refrigerator is, above the bottom thereof, provided with a round opening 26 that provides an air outlet and in this opening there is preferably arranged a filtering screen 27 which prevents the passage of flies or insects into the refrigerator box.

By capillary attraction the fabric sheet 12 will be saturated with water as will the portion of the sheet wrapped around the coil 14. The motor when in operation revolves the fan blades 20 which directs air currents between the cloth wrapped coils 14 and through

the face sheet 12. The air quickly evaporates the water from the fabric and thereby cools and vaporizes the air in the refrigerator. The fan also draws air from the room through the intake pipe 10. This air cools the motor as it rushes past the cylinder but the motor is also retained in cool condition by the water passing from the pan through the pipes 15 and 6 and the wrapped portion of the coil which is arranged around the motor. This, of course, heats the water in the wrapped portion of the coil and causes such water to be redelivered into the pan 8. The cool air circulates down through the wire shelves 2 but is circulated between the compartments provided by the said members 2. Air finds an outlet through the opening 26. Since the air in the refrigerator is full of moisture, drops of water condense on the sides of the refrigerator. The drops slide downward and drain into the funnel 3 and such water is elevated and delivered into the pan 8 by the operation of the rotary pump 5. The cooling process is continuous and, therefore, food in the refrigerator is retained in a cooled condition.

It is believed the foregoing description will fully set forth the construction of my improvement and the advantages thereof so that further detailed description will not be apparent. Obviously we do not wish to be restricted to the precise details shown and described and, therefore, hold ourselves entitled to make such changes therefrom as fairly fall within the scope of what we claim.

Having described the invention, we claim:

1. A refrigerator including a box having horizontally arranged reticulated partitions therein and having an air outlet opening adjacent to the bottom thereof and an air inlet opening adjacent to the top thereof, a casing having an open top and an open front communicating with the last named opening, a water containing pan in the casing, a coil having a pipe connection with the bottom of the pan, and a return pipe which communicates with the top of the pan, an electrically driven fan in the casing, and a loosely woven fabric sheet affording a front for the casing and extending into the pan and having a back portion which is wound around the coil.

2. A refrigerator including a box having horizontally arranged reticulated partitions therein and having an air outlet opening adjacent to the bottom thereof and an air inlet opening adjacent to the top thereof, a casing having an open top and an open front communicating with the last named opening, a water containing pan in the casing, a coil having a pipe connection with the bottom of the pan, and a return pipe which communicates with the top of the pan, an electrically driven fan in the casing and a loosely woven fabric sheet affording a front for the casing and extending into the pan and having a back portion which is wound around the coil, a funnel on the top of the casing having a spout communicating with the pan and a float valve in the pan having a stem extending into the spout of the funnel.

3. A refrigerator including a box having horizontally arranged reticulated partitions therein and having an air outlet opening adjacent to the bottom thereof and an air inlet opening adjacent to the top thereof, a casing having an open top and an open front communicating with the last named opening, a water containing pan in the casing, a coil having a pipe connection with the bottom of the pan and a return pipe which communicates with the top of the pan, an electrically driven fan in the casing and a loosely woven fabric sheet affording a front for the casing and extending into the pan and having a back portion which is wound around the coil, a funnel on the top of the casing having a spout communicating with the pan and a float valve in the pan having a stem extending into the spout of the funnel, a rotary pump operated by the motor of the fan, a pipe leading downwardly therefrom, passing through the bottom of the refrigerator, a funnel-shaped member in the said bottom of the refrigerator with which the pipe communicates and a pipe at the outlet end of the pump casing directed into the pan.

4. A refrigerator including a box having horizontally arranged reticulated partitions therein and having an air outlet opening adjacent to the bottom thereof and an air inlet opening adjacent to the top thereof, a casing having an open top and an open front communicating with the last named opening, a water containing pan in the casing, a coil having a pipe connection with the bottom of the pan, a return pipe which communicates with the top of the pan, an electrically driven fan in the casing and a loosely woven fabric sheet affording a front for the casing and extending into the pan and having a back portion which is wound around the coil, a funnel on the top of the casing having a spout communicating with the pan and a float valve in the pan having a stem extending into the spout of the funnel, a rotary pump operated by the motor of the fan, a pipe leading downwardly therefrom, passing through the bottom of the refrigerator, a funnel-shaped member in the said bottom of the refrigerator with which the pipe communicates and a pipe at the outlet end of the pump casing directed into the pan and the return pipe from the coil being wound around the casing of the fan motor.

In testimony whereof we affix our signatures.

ROY THOMAS IULA.
JOHN ANTHONY PRUDENTE.