

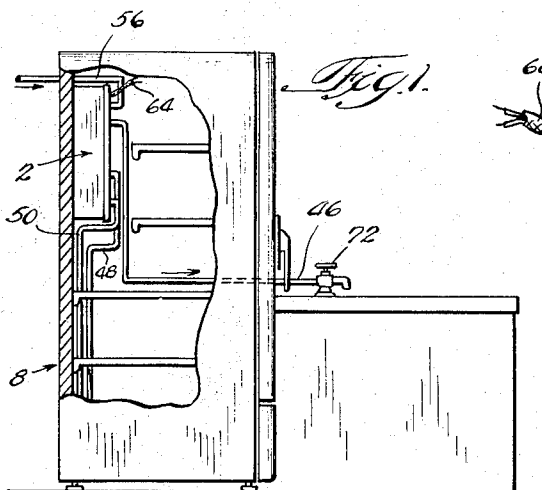
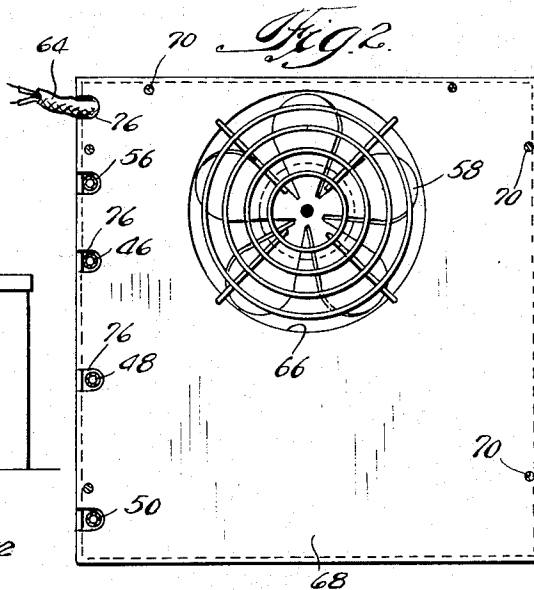
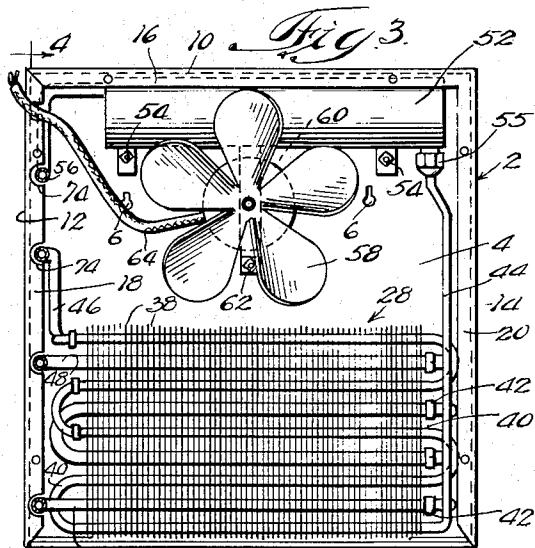
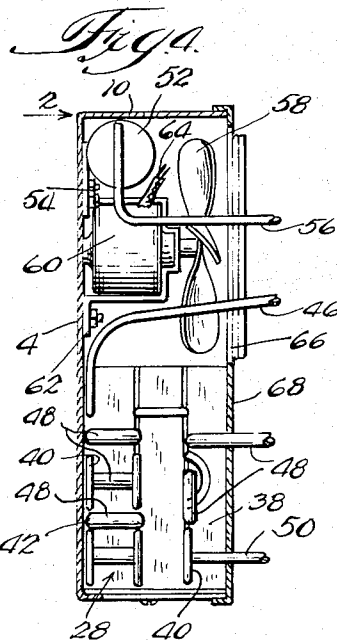
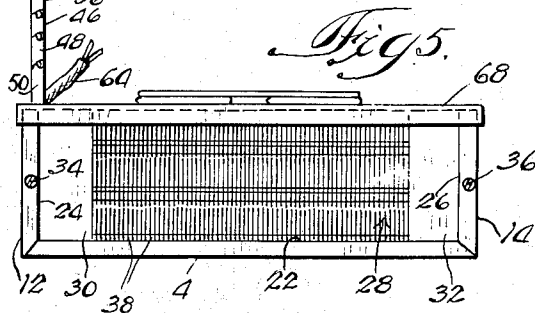
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J. H. LAZAR

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FORCED CONVECTION EVAPORATOR AND WATER CHILLER

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INVENTOR.
Joseph H. Lazar
BY
B. Gordon Aller.
Att'y.

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FORCED CONVECTION EVAPORATOR AND WATER CHILLER

Joseph H. Lazar, Chicago, Ill.

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4 Claims. (Cl. 62-128)

This invention relates to a forced convection evaporator and water chiller and more particularly to a system for providing refrigeration, as well as a supply of cooled water for connection to a faucet or tap.

According to prior art practices, public dispensaries and private owners have utilized separate units for refrigerating and water chilling, thereby incurring costly maintenance charges and wasting valuable space required for the installation of separate units. Also, prior art water chillers have generally been unsatisfactory in failing to provide an ample reserve of cooled water for use under rush conditions, particularly by public dispensaries.

Accordingly, a primary object of the invention is to devise a forced convection evaporator and water chiller which will cool both a refrigerator and a supply of water for connection to a source of use, such as a faucet or tap.

Another object of the invention is to prechill a large volume of water before passing it through coils in heat exchange relationship with refrigerant coils.

Still another object of the invention is to incorporate the above features in a readily removable portable unit which may be mounted in a refrigerator.

A further object of the invention is to provide a single unit such as above described wherein the components are compactly arranged to occupy a minimum amount of space consistent with maximum efficiency in refrigeration and water cooling.

Still another object of the invention is to accommodate quick removal and replacement of sub-units such as the circulation fan, as well as the water and refrigerant coils within the refrigeration unit.

The foregoing and other objects and advantages of the invention will become apparent from the following specification, and the accompanying drawings, wherein:

Fig. 1 is a general assembly view of the novel forced convection evaporator and water chiller applied to a refrigerator and a cold water faucet, the refrigerator side wall being partly broken away;

Fig. 2 is a front elevational view of the unit;

Fig. 3 is a view similar to Fig. 2, with the cover of the unit removed;

Fig. 4 is a sectional view on line 4-4 of Fig. 3; and

Fig. 5 is a bottom plan view of the unit.

Referring now to the drawings and describing the illustrated embodiment of the invention, the novel forced convection evaporator and water chiller unit comprises a readily portable casing generally designated 2, said casing preferably being formed of a single sheet of metal or other suitable material which is slotted and bent to form a base or rear wall 4 (Figs. 3 and 4) having means such as key-shaped slots 6 to conveniently hang the casing within a refrigerator 8 as shown in Fig. 1.

The casing also comprises a top end wall 10 and spaced side walls 12 and 14 bent at approximately right angles with respect to the base wall 4, the forward edge of the wall 10 being inwardly flanged as at 16 (Fig. 3), and

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the forward edges of the side walls 12 and 14 being inwardly flanged as at 18 and 20, respectively.

The lower or bottom end of the casing is open and best seen in Fig. 5, and the rear wall 4 is provided at that point with a forwardly extending flange 22 aligned with inwardly extending flanges 24 and 26 of the side walls 12 and 14, respectively.

The flanges 22, 24, and 26 afford a seat at the bottom of the casing for a readily replaceable cooler sub-unit generally designated 28 which is provided with bottom plates 30 and 32, secured as by screws 34 and 36 to the flanges 24 and 26 respectively.

The cooler unit also comprises a plurality of heat transfer fins or plates 38 which are arranged in approximately parallel relationship to the side walls 12 and 14, said fins having openings for the reception of water coils 40 and refrigerant coils 42 arranged at approximately right angles to the water coils, as best seen in Fig. 4.

Water is circulated through the coils 40 by an inlet line 44 and an outlet line 46; and refrigerant is circulated through the coils 42 by an inlet line 48 and an outlet line 50, so that the water and refrigerant pass through the coils in heat exchange relationship to cool the water.

Preferably the casing 2 is provided with a reserve water tank 52, removably secured in any desired manner as by screws 54 to the rear wall 4, said tank being removably connected at its outlet or discharge end by a fitting 55 to the inlet line 44 of the unit 28, and said tank being connected at its inlet end to an inlet line 56.

The tank 52 is preferably arranged at the suction side of an air fan 58 operatively connected to an electric motor 60, detachably secured as by screws 62 to the wall 4. The motor 60 is provided with a cable 64 carrying the lead wires therefor.

Thus, it will be understood that during operation of the device, as shown in Fig. 1, air in the refrigerator is continuously circulated by the fan 58, which draws air from the open bottom of the casing 2 between the fins 38 and coils 40, 42 and across the tank 52. The discharge side of the fan blows the air forwardly out of the casing 2 through an opening 66 in a cover 68 secured as by screws 70 to the flanges 16, 18 and 20. This circulating system provides efficient refrigeration within the refrigerator 8 and also precools water in the tank 52 before it enters the coils 40, to afford a maximum quantity of cooled water supplied to a faucet or tap 72 (Fig. 1) by the outlet line 46.

The flange 18 is provided with slots or notches 74 (Fig. 3), and the cover 68 is provided with mating slots or notches 76 to accommodate passage of the cable 64 and the lines 46, 48, 50 and 56, which pass through suitable openings (not shown) of the refrigerator 8.

Thus, it will be understood that the novel evaporator and water chiller unit is entirely self-contained and is readily portable upon disconnection of the cable and lines which pass through the opening of the refrigerator. Furthermore, the sub-unit 28 performs a dual function of cooling the water supply to the tap 72 and of refrigerating the items in the refrigerator 8.

Changes may be made in form and substance without departing from the spirit of the invention or sacrificing any of the advantages and the right is hereby reserved to make all changes which fairly fall within the scope of the following claims.

What is claimed as new and desired to be secured by Letters Patent of the United States is as follows:

1. A portable refrigeration system enclosed in a casing comprising a water source, a plurality of water coils in fluid connection with said water source, a plurality of refrigerant coils in heat exchange relationship with said water coils, a water reservoir in addition to said water source, said reservoir having its outlet side con-

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ected to the water coils, and fan means for drawing air between said coils and thence across said reservoir to prechill the water therein.

2. An evaporator and water chiller unit comprising a casing, a refrigerant line in said casing, a water line in said casing, said lines having portions passing in heat exchange relationship to each other in said casing, an opening in the casing affording an air inlet at one side of said portions, a fan in said casing at the opposite side of said portions, said fan having its suction side communicating with said opening, and a water reservoir detachably secured in said casing at the suction side of said fan whereby air from said opening is drawn by said fan across said portions and thence across said reservoir, said reservoir being connected to said water line to afford a supply of prechilled water thereto.

3. A refrigeration unit comprising a casing having a rear wall, top and side walls projecting forwardly therefrom, a refrigerant sub-unit removeably connected to said side walls at the lower end of the casing, said lower end of said casing being open to afford an air inlet, said sub-unit comprising refrigerant coils and water coils in heat exchange relationship, a cover on said casing removeably attached to said side and top walls, an air outlet opening through said cover, a fan removeably mounted in the casing, said fan having its discharge side communicating with said outlet opening, and a reservoir removeably mounted adjacent opening at the suction side

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of said fan, said reservoir being connected to said water coils to afford a supply of precooled water thereto.

4. A portable refrigeration unit comprising a casing with top and side walls, said side walls having inturned flanges at their forward and bottom edges, a sub-unit detachably secured to the flanges at the bottom of said side walls, said sub-unit comprising a plurality of fins approximately parallel to said side walls, and said sub-unit having water and refrigerant coils in heat exchange relationship passing through openings of said fins, the bottom of said casing being open to accommodate flow of air between said fins, and means for impelling air through said opening and a water reservoir removeably mounted in said casing in the path of said air flow and connected to said water coils to afford a supply of precooled water.

References Cited in the file of this patent

UNITED STATES PATENTS

1,848,195	Pickens	Mar. 8, 1932
2,064,044	Wichmann	Dec. 15, 1936
2,065,949	Sandell	Dec. 29, 1936
2,083,477	Simerd	June 8, 1937
2,097,851	Wenzl	Nov. 2, 1937
2,150,224	Hull	Mar. 14, 1939
2,150,233	Martin	Mar. 14, 1939
2,230,905	Popky	Feb. 4, 1941