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G. C. RUDD ET AL

2,459,097

PUMP FOR EVAPORATIVE AIR COOLERS OR THE LIKE

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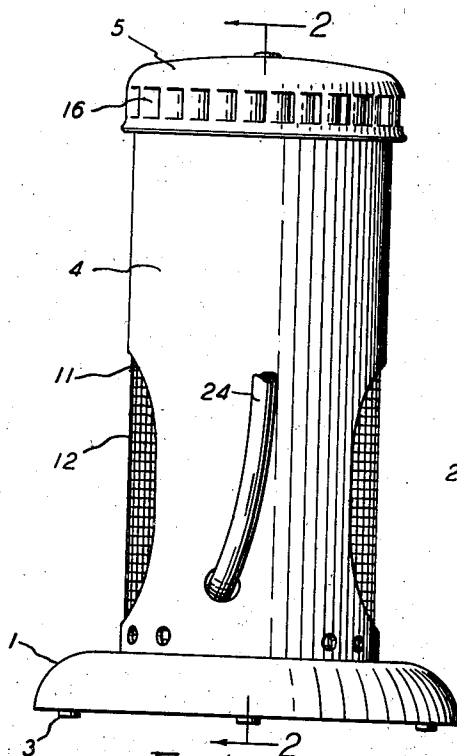


Fig. 1.

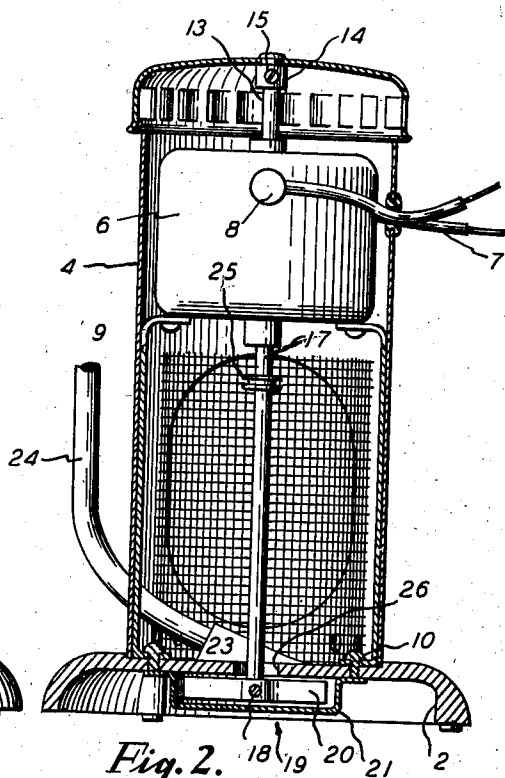


Fig. 2.

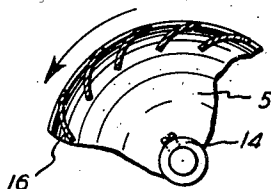


Fig. 3.

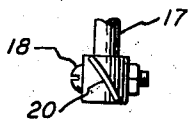


Fig. 5.

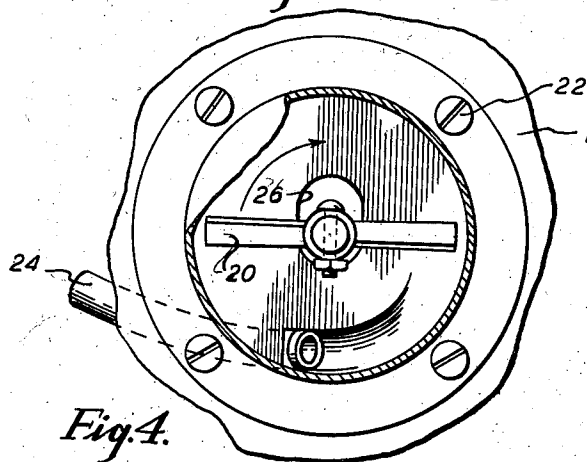


Fig. 4.

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PUMP FOR EVAPORATIVE AIR COOLERS
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1 Claim. (Cl. 103—87)

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This invention relates to pumps such as those used in evaporative cooling units.

An object of the invention is to provide, in a pump of the referred to class, a construction and arrangement which is more efficient than corresponding pumps now in use.

A particular object of the invention is to provide an efficient combination fan and cover which will prevent water from dropping on the electric motor to prevent shorting.

Another object of the invention is to provide in a pump having a centrifugal impeller, means whereby the friction load of the fluid is materially reduced with reference to pumps of the same general type.

A further object of the invention is to provide, in addition to the foregoing, fan cooling means which draws air upwardly and outwardly over the motor so as to cool and prevent fluid from accumulating on the same.

These and other objects of the invention will become apparent from the following description of an exemplary form of the invention, wherein:

Figure 1 is an elevational view of a pump embodying the features of the present invention.

Figure 2 is a vertical sectional view taken on lines 2—2 of Figure 1 and showing the relative positions of the combination fan and cover, the electric motor, pump impeller, and related parts.

Figure 3 is a broken bottom plan view of the fan and cover.

Figure 4 is a broken bottom plan view of the base and impeller housing and showing the relative position of the impeller blades with respect to the outlet, and

Figure 5 is a side elevational view of the impeller and showing the pitch of its blades.

Accordingly, the form of the invention illustrated includes an annular base 1 having an opening recess 2 in the bottom thereof, and preferably includes three equally spaced feet 3 around the base perimeter.

Concentrically mounted on the base 1 there is a cylindrical housing 4 having a cup shaped combination fan and cover 5 above and over the upper end of the said housing.

Within the housing 4, and mounted for operation about a vertical axis, there is an electric motor 6 having its lead wires 7 through the side of the said housing and a resilient washer in the latter, said wires being connected with the motor connections 8 (only one of which is shown). The motor 6 is mounted upon C shaped brackets 9 which are secured at their lower ends to the base 1 by screws 10.

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The sides of the housing 4 are provided with openings 11 below the motor 6 and may include strainers 12 of wire screen or the like.

A fan shaft 13 extends upwardly from the motor 6 and secures the referred to fan and cover 5 in place. The last referred to arrangement includes a fan hub 14 which is concentrically and rigidly mounted through and beneath the diametric center of the fan 5 and secured to the fan shaft 13 by means of a set screw 15. The blades 16 of the fan 5 are in the form of vertically disposed and inwardly directed louvers or vanes, and are positioned for drawing air over the motor 6 between the same and the inner wall of the housing 4, and outwardly through the said fan blades.

An impeller shaft 17 extends downwardly from the motor 6 through the axial center of the housing 4 and into the recess 2 of the base 1 where there is mounted, by means of a screw 18, an impeller 19, having radially and horizontally disposed blades 20. An impeller housing 21 within the base cavity 2 is secured by screws 22, to the base 1 and covers the impeller assembly 19.

An integral angular projection or boss 23 is positioned on the upper surface of the base 1 and near the impeller housing wall 21. An outlet tube 24 is connected with the boss 23, which is hollow, to provide communication between the said tube and the interior of the impeller housing 21. As shown in Figure 5, the impeller blades 20 are angularly disposed with respect to the shaft 17 so as to provide pitch to the impeller assembly 19, the direction of pitch being of such that it tends to lift the fluid within the housing 21 rather than to throw it to the side as in conventional centrifugal pumps. The last described arrangement tends to reduce the friction loads occasioned by the action of the fluids against the inner wall of the housing 21.

Details of construction illustrated include a guard 25 around the lower motor shaft 17 to prevent water from entering the said motor.

In operation, the pump is placed within a level of water which is less than the height of the guard 25. Water enters the housing 4 through the housing openings 11 and flows downwardly into the impeller housing 21 after passing through an inlet 26 in the base 1. As shown in Figures 2 and 4, the inlet 26 accommodates the vertical shaft 17, and is offset with respect to the said shaft to permit adequate flow therethrough. When the motor 6 is actuated, the action of the impeller blades is to raise the water into the

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hollow base projection 23 and thence upwardly through the outlet tube 24.

What is claimed is:

A pump comprising a base, a tubular housing vertically mounted on said base, a motor mounted within the upper end of said tubular housing and spaced from the wall thereof, shafts extending vertically above and below said motor and driven thereby, a cup shaped combination fan and cover secured to the upper end of said shaft, vertically disposed louvers in the periphery of of said fan, an impeller housing mounted beneath said base, impeller blades within said impeller housing and secured to the lower end of said shaft, fluid inlet means in said base and communicating with the interior of said impeller housing, fluid outlet means in said base over said blades and asymmetrically positioned with

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respect to the center thereof, and the said blades being angularly disposed for directing the action of the same toward the said outlet.

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