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HUMIDIFIER

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Fig. 1

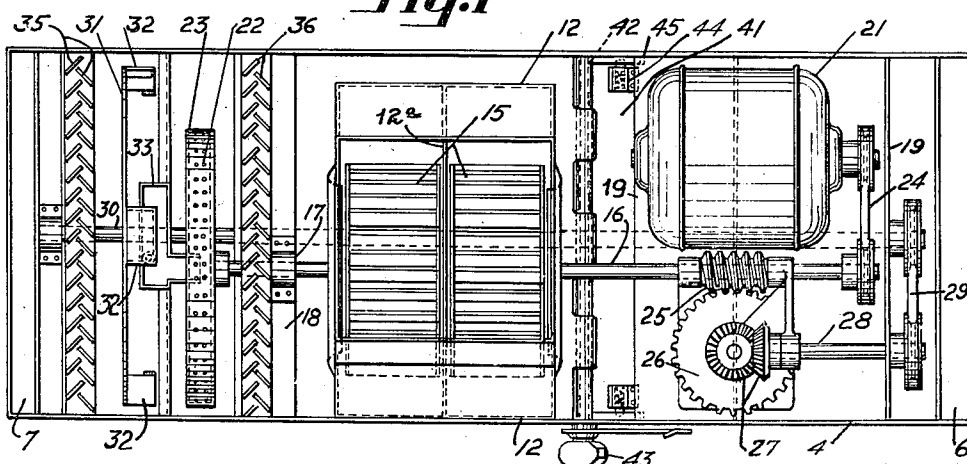


Fig. 2

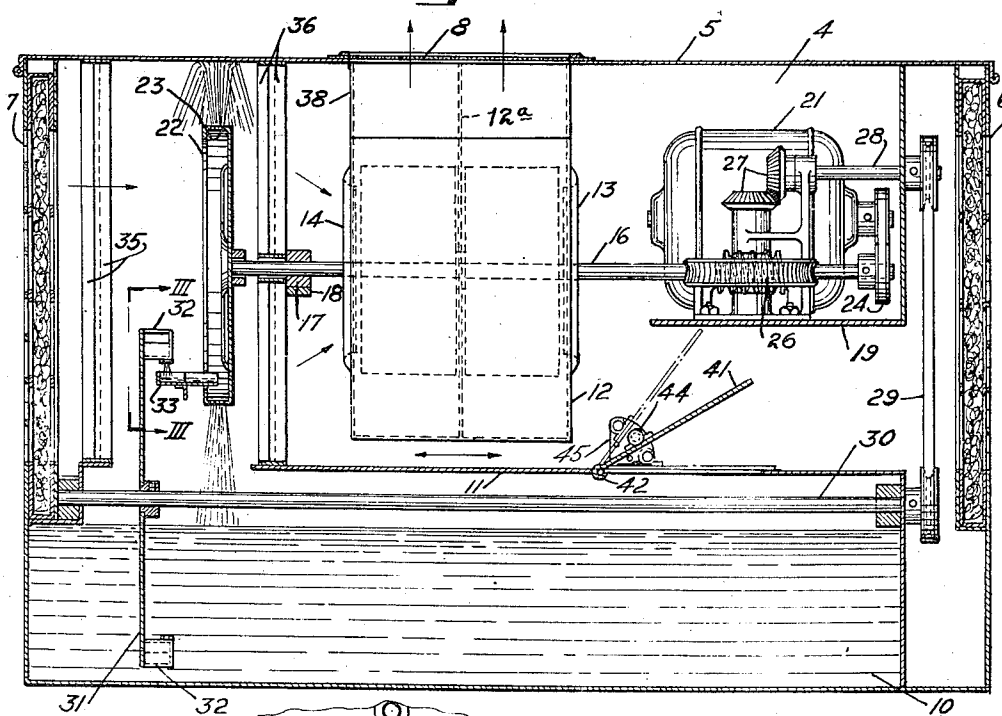
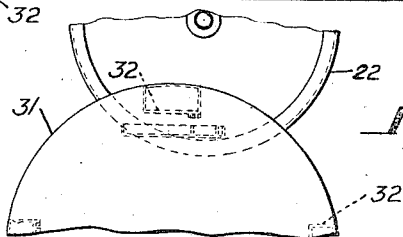


Fig. 3

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UNITED STATES PATENT OFFICE

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HUMIDIFIER

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3 Claims. (Cl. 261—90)

My invention relates to humidifying and air-conditioning devices, and is of a type that is particularly suitable for use in homes, offices, and the like, although various features thereof render it suitable also for use in relatively large systems.

5 Broadly stated, my invention is directed to that class of apparatus wherein a fan or blower is employed to draw air past screening and spraying devices where air is discharged into a room and may be drawn either from out-of-doors or from within the room where the air is being conditioned.

One object of my invention is to provide apparatus of such form that water will be sprayed into the path of the air at a predetermined rate, irrespective of changes in volume of water at the source of supply.

Another object of my invention is to provide means for varying the extent to which the air is humidified, without the necessity of changing the rate of water supply.

A further object of my invention is to provide a generally simplified and improved form of humidifying apparatus.

25 One form which my invention may take is shown in the accompanying drawing wherein Figure 1 is a sectional plan view; Fig. 2 is a vertical sectional view, and Fig. 3 is a view taken on the line III—III of Fig. 2.

30 The apparatus is shown as mounted in a housing 4 which may suitably be of rectangular form, and of dimension to rest upon an ordinary steam or hot-water radiator. The housing is provided with a lid or cover 5 and has air inlets at its ends over which are placed replaceable screens or filters 6 and 7 respectively, for removing the dust particles and pollen from the air which is drawn into the housing.

40 An outlet opening is provided in the top of the housing, and this opening may be covered by a protecting screen 8. It will be understood that heating or cooling coils could also be mounted at the discharge opening, to change the temperature or humidification of the air discharged from the housing.

45 A water reservoir 10 is positioned in the bottom of the housing 4 and is supplied with water from time to time in any suitable manner. A partition plate 11 is mounted above the reservoir and partially covers the same. A fan casing 12 is secured to the housing 4, and is provided with eyes or air inlet openings 13 and 14, the casing being open at its upper side for discharge past the screen 8. A partition plate 12a divides the casing into compartments. A centrifugal fan or

blower 15 is positioned in each compartment of the casing 12 and is mounted on a shaft 16. Near one of its ends, the shaft is supported in a bearing 17 that is carried by a strut 18. At its other end, the shaft is mounted in a bearing that is carried by a bracket 19, which bracket also supports a motor 21.

The outer end of the shaft 16 carries a spray disc 22 that has an annularly-formed channel 23 provided with spray openings that will discharge water radially, in the form of a fine mist or spray, when the motor 21 is being driven.

A belt drive 24 transmits power from the motor shaft to the shaft 16, and the shaft 16 is rotated quite rapidly. The shaft 16 carries a worm 25 that has driving connection with a worm gear 26, which through beveled gearing 27, drives a shaft 28. The shaft 28, through a belt 29, drives a shaft 30. The worm gear reduction is such that the shaft 30 is driven quite slowly relative to the motor speed. An elevator or cup carrier 31 is secured to the shaft 30 and is provided with cups 32 which move through the tank 10 when the shaft 30 is driven.

25 The cups in passing through the tank 10 collect water, and, at their uppermost positions, discharge into a trough 33 which has a spout that directs the water into the trough 23. The rate of rotation of the carrier 31 is sufficiently slow to permit the cups to collect water in passing through the tank, and to become emptied when passing through their upper positions. It will be seen that with the shaft 30 turning at a given rate of speed, a predetermined quantity of water will be delivered to the spray device 22, regardless of changes in water depth within the tank 10.

Baffle plates 35 are provided which while permitting the entry of air into the housing 5, will prevent water from being thrown through the end of the casing. A second set of baffle plates 36 are provided between the spray 22 and the motor housing 12, so as to catch drops of water that would otherwise be carried along by the air and be discharged from the housing into the room.

45 Air may enter from either end of the housing 4, and be drawn through the openings 13 and 14 into the fan casing. Air may flow in either direction past the portion 38 of the casing, and drawn into either of the openings 13—14 and discharged from the fan casing and through the discharge opening 8.

55 All or a portion of the air which is drawn through the screen 6 may be caused to pass through the tank 10, and take up moisture not only from the surface of the water in the tank, 55

but will be passed through the spray that is charged by the disc 22. Control of direction of flow at this end of the housing is effected by a damper or valve 41 that is rigidly connected to a pintle or shaft 42 having a knob 43 by which the shaft is turned to raise and lower the damper 41. It could also be operated automatically by a humidistat or electrically controlled by a moisture-registering device. It will be seen that when the damper is in its lowermost or closed position, as indicated by dotted lines in Fig. 2, all of the air which enters at 6 will pass directly into the fan casing, while if the damper is raised to its uppermost position, all of such air will be bypassed through the water tank and the water spray.

The damper is, of course, set at various positions in accordance with the humidity desired in the air which is discharged from the housing. The damper carries a pair of spring-pressed pawls or dogs 44 which are moved into interlocking engagement with recesses in plates 45 that are secured to the sides of the tank, so that the damper will be yieldably maintained at its various positions.

I claim as my invention:—

1. A humidifier comprising a housing, a motor mounted in the housing adjacent to one end thereof, a blower positioned between the motor and the other end of the housing, each of the said housing ends being provided with an air inlet and the housing being provided with an air outlet leading from the blower, a water reservoir, a spray

device disposed intermediate the blower and the second-named end of the housing, and means for supplying the water from the reservoir to the spray device.

2. A humidifier comprising a housing, a motor mounted in the housing adjacent to one end thereof, a blower positioned between the motor and the other end of the housing, each of the said housing ends being provided with an air inlet, and the housing being provided with an air outlet leading from the blower, a water reservoir, a spray device disposed intermediate the blower and the second-named end of the housing, means for supplying the water from the reservoir to the spray device, and means for directing past the said spray device desired portions of air which enter at the first-named end of the housing.

3. A humidifier comprising a housing having inlet and outlet openings, a water reservoir, means for causing flow of air through said openings, a spray device positioned in the path of air flow comprising a rotatable member having a peripherally-disposed channel provided with spray openings, a trough extending transversely of the axis of said member and having a laterally extending spout positioned adjacent to said channel and arranged to discharge into the same, and a cup carrier movable through the reservoir to receive the water and through a path extending above and longitudinally of the trough to discharge the received water into said trough.

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