

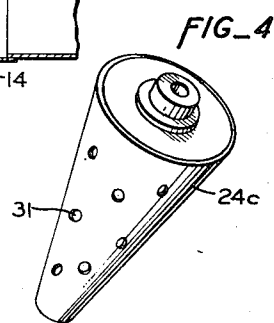
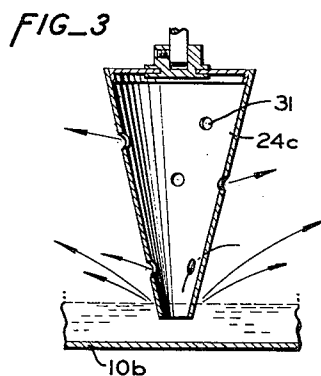
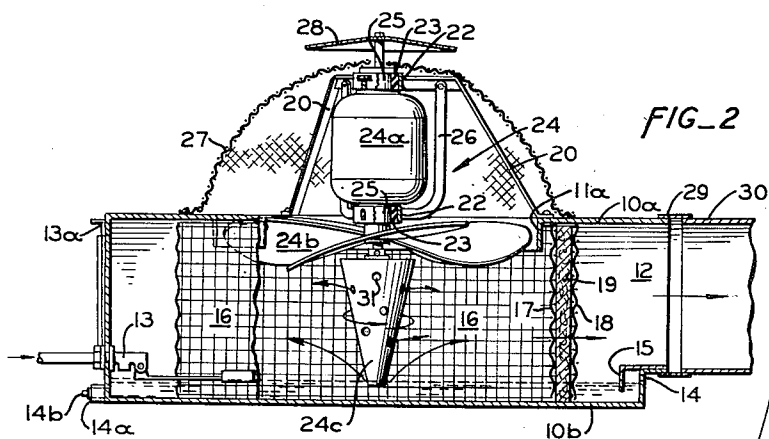
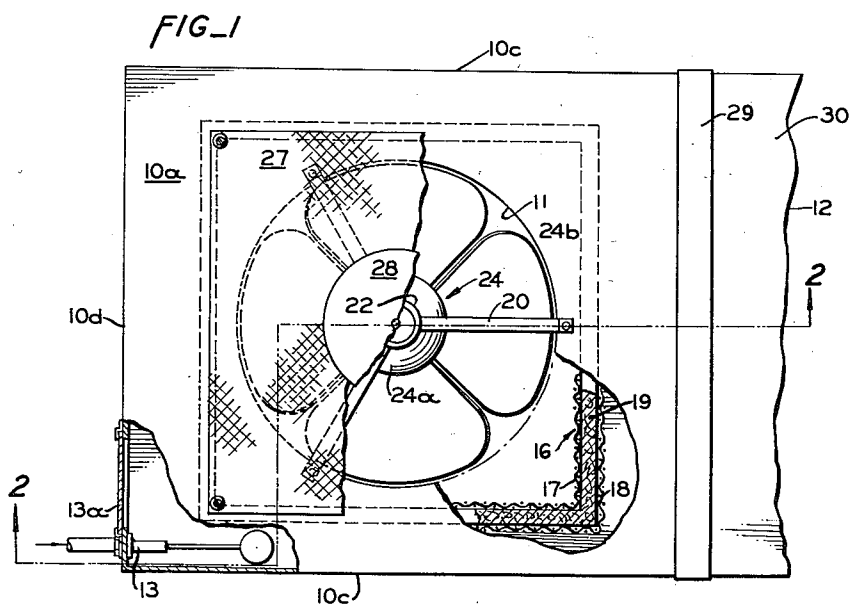
Nov. 20, 1956

J. ERANOSIAN

2,771,283

AIR CONDITIONING UNIT

Filed May 5, 1955



INVENTOR.
JOHN ERANOSIAN

BY
Mellin and Hanson
ATTORNEYS

1

2,771,283

AIR CONDITIONING UNIT

John Eranosian, Woodside, Calif.

Application May 5, 1955, Serial No. 506,200

2 Claims. (Cl. 261—30)

This invention relates to devices for humidifying and conditioning air.

The object of the invention is to provide a relatively simple compact unit that is capable of efficiently humidifying and conditioning air.

Another object of the invention is to provide a motor driven air conditioning unit which is quiet in operation and which water cools and filters a large volume of air with a minimum of power consumption.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the following drawings, in which:

Fig. 1 is a top plan view with portions of the top wall of the casing broken away.

Fig. 2 is a side elevation of the device along the line 2—2 of Fig. 1.

Fig. 3 is a side elevation of the foraminous frusto-conical shaped pump.

Fig. 4 is a perspective view of the foraminous frusto-conical shaped pump.

My improved air conditioning unit comprises a casing 10 preferably formed of sheet metal which is generally rectangular in plan. This casing 10 is formed with a top wall 10a, a parallel bottom wall 10b, side walls 10c, and end wall 10d. The end of the casing opposite the end wall 10d is open so that it will constitute an air outlet opening 12, at which point it may be connected with a suitable conduit for conveying the conditioned air to the point of discharge. The walls 10b, 10c and 10d are imperforate and the distance between the top wall 10a and bottom wall 10b is relatively less than the longitudinal dimensions of the sides 10c or the end 10d so as to form a generally rectangular casing which is relatively shallow. At the discharge end of the casing opposite the end wall 10d, the bottom wall 10b is upturned slightly in order that water may be contained in the casing as indicated in Fig. 2.

Located in the end wall 10d at a spaced distance above the bottom wall 10b is a float controlled valve 13 of conventional construction which operates automatically to maintain the water in the bottom of the casing at a predetermined level as indicated. An overflow outlet 14 is formed in the upturned end of the bottom wall 10b to prevent the water from exceeding its maximum depth in the event of failure of the float controlled valve 13. A water seal baffle plate 15 is arranged at a spaced distance parallel to the upturned end of the bottom wall 10b to prevent discharge of the water through the overflow opening 14 under the influence of the air currents created in the casing, as will be described.

For the purpose of draining the casing, I provide a drain opening 14a plugged by a removable plug 14b. Above the plugged drain opening 14a and above the float controlled valve 13 is a removable panel 13a to enable access to be had for purposes of adjusting or replacing said float valve.

The top wall 10a is formed with a centrally located circular air inlet opening 11, the periphery of which is cir-

2

cumscribed by a downturned flange 11a, as illustrated. Arranged within the casing and concentrically to the opening 11 is a rectangular filter element 16 which extends perpendicularly between the top 10a and the bottom 10b of the casing at a spaced distance exteriorly of the flange 11a which circumscribes the circular opening 11. The filter element 16 is formed of spaced inner and outer wire mesh walls 17 and 18 between which is held a fiber-glass filter medium 19. Obviously, air entering the casing through the opening 11 must pass through the walls of this filter element into the casing before it can discharge through the discharge opening 12.

Arranged concentrically of the opening 11 in the top wall 10a is a motor driven fan and pump unit 24, which unit comprises an electric motor 24a, a fan 24b, and a pump 24c. The fan and the pump are, of course, driven by the shaft of the electric motor. This shaft extends coaxially of the opening 11 and the unit is so disposed and mounted that the motor 24a is positioned above the top wall 10a of the casing, with the fan substantially within the opening 11 as defined by the circular flange 11a, and with the pump 24c disposed with its lower end extending slightly below the fluid level in the bottom of the casing.

The unit 24 is supported relative to the casing by means of bearing rings 22 having inner rubber sleeves 23 which embrace the exterior of the motor bearings 25. The rings 22 are of the clamp type so that they may be released and the motor removed therefrom. Fixed to the uppermost of the rings 22 are rigid spider legs 20 which are fastened at their outermost ends to the casing at the periphery of the opening 11, and at their innermost ends to the ring 22. The spider legs extend upwardly and inwardly, as illustrated. The lower ring 22 is connected to the spider legs 20 by bracket arms 26. By this construction the motor is firmly and rigidly mounted in position. The rings 22 may be of the split or like type so that they may be removably clamped about the exterior of the motor bearings 25. The rubber sleeves 23, of course, are to absorb and dampen vibration.

As previously pointed out, at the lower end of the motor shaft there is fixed an inverted foraminous frusto-conical pump 24c. This pump acts when the motor is in operation to lift water along its conical surfaces and discharge the same through the openings therein into the air streams, as illustrated in Fig. 2 of the drawings.

For protection from flies and foreign matter, a semi-spherical screen 27 is arranged over the motor unit, as illustrated in Fig. 2, with its base fixed to the top wall 10a of the casing. For additional protection of the motor, a circular shield or deflector plate 28 is arranged exteriorly of the screen 27 and concentrically of the motor, as illustrated.

When the motor 24a is started, the fan 24b draws air into the casing 10 through the circular air inlet opening 11. The pump 24c revolves in the water in the bottom of the casing and lifts the water along its conical surfaces discharging the same through the openings 31 therein into the air stream and spraying it outwardly on the surface of the filter element 16, maintaining said filter element in a moist condition at all times that the motor is running. The air drawn into the casing 10 by the fan 24b is forced through the moist filter element 16 and is humidified, cooled and cleaned and thereafter passes out of the casing 10 through the air outlet opening 12.

When the water level in the bottom of the casing 10 is lowered, the float controlled valve 13 opens and additional water flows into the casing, in this way the water is maintained at a predetermined level throughout the operation of the unit so that at all times air passing through said unit is properly cooled, humidified and conditioned.

By extending the bracket arms 20 upwardly from the

casing and suspending the motor unit 24 downwardly therefrom, the circular air inlet opening 11 is not impaired in any way by braces or supports. In this way the pulsating roar that customarily results when such braces or supports are in close proximity to the blades of a fan is eliminated. In addition, by mounting the motor in the rubber sleeves 23 and supporting the motor by its bearings at each end thereof the vibratory noises usually transmitted to the casing 10 are greatly reduced if not eliminated. In many air conditioning units the casing acts as a sounding board to amplify motor and vibratory noises.

I have also found that such motor and vibratory noises are further reduced by using a taped joint as indicated at 29 between the air outlet opening 12 and the conduit 30 into which the humidified and conditioned air is directed.

By making my filter element rectangular in shape, I provide a large filtering area through which air can pass and, therefore, with a comparatively small motor and with minimum power consumption I secure a maximum output of cooled humidified and conditioned air.

While I have shown and described the preferred form of my invention, it is to be understood that various changes may be made in this construction, without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A device of the character described comprising a generally rectangular casing having top and bottom horizontal walls spaced from each other, side and end walls extending vertically between said top and bottom walls, an air inlet opening in said top wall and an air outlet opening in one of said end walls, the bottom edge of said outlet opening being spaced above the said bottom wall, means for maintaining a predetermined quantity of water in the bottom of said casing, a generally rectangular filter element within said casing extending between said top and bottom walls and surrounding said inlet opening and spaced inwardly of said side and end walls, spider legs attached at one of their ends to said top wall of said casing at points spaced circumferentially about said air inlet opening, the opposite ends of said spider legs converging upwardly and inwardly from said casing, a bearing ring affixed to said opposite ends of said legs, a motor mounted in said bearing ring and extending downwardly therefrom but spaced above said air inlet opening, a fan fixed to the lower end of said motor and positioned within said casing coaxially with said air inlet opening, and a foraminous frusto-conical pump fixed to said fan extending downwardly therefrom in order that the open end thereof is

disposed below the surface of the water in the bottom of said casing so that when said fan and pump are rotated the said pump will spray water onto the surface of the filter element and said fan will draw air into said casing and force said air through said filter element and out through the said outlet opening, said air being cleaned and conditioned when passing through said filter element.

2. A device of the character described comprising a generally rectangular casing having top and bottom horizontal walls spaced from each other, side and end walls extending vertically between said top and bottom wall, an air inlet opening in said top wall and an air outlet opening in one of said end walls, the bottom edge of said air outlet opening being spaced above the said bottom wall, means for maintaining a predetermined quantity of water in the bottom of said casing, a drain outlet spaced above said bottom wall and below said air outlet opening, a generally rectangular filter element within said casing extending between said top and bottom walls and surrounding said inlet opening and spaced inwardly of said side and end walls, a first spider having a plurality of legs, said legs attached at one of their ends to said top wall of said casing at points spaced circumferentially about said air inlet opening, the opposite ends of said spider legs converging upwardly and inwardly from said casing, a bearing ring affixed to said opposite ends of said legs, a second spider having a plurality of legs, the legs of said second spider being affixed to the opposite upper ends of the legs of said first spider and extending downwardly and inwardly from said opposite upper ends of the legs of said first spider, a second bearing ring affixed to the inwardly extending legs of said second spider, a motor mounted in said bearing rings and spaced above said air inlet opening, a fan fixed to the lower end of said motor and positioned within said casing coaxially with said air inlet opening, and a foraminous frusto-conical pump fixed to said fan extending downwardly therefrom in order that the open end thereof is disposed below the surface of the water in the bottom of said casing so that when said fan and pump are rotated the said pump will spray water onto the surface of the filter element and said fan will draw air into said casing and force said air through said filter element and out through the said outlet opening, said air being cleaned and conditioned when passing through said filter element.

References Cited in the file of this patent

UNITED STATES PATENTS

1,952,269	Lundquist	Mar. 27, 1934
2,053,647	White	Sept. 8, 1936
2,237,497	Munford	Apr. 8, 1941
2,713,509	Long	July 19, 1955