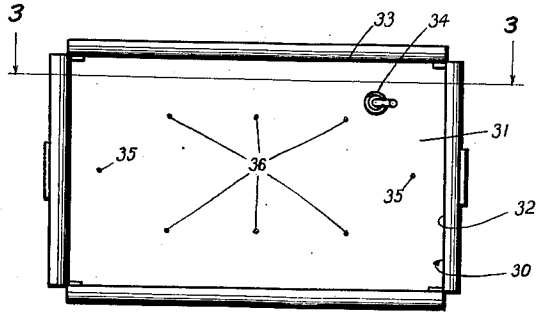
Aug. 24, 1937. W. H. FABRY 2,091,198

PORTABLE AIR CONDITIONING APPARATUS

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FIG. 2.



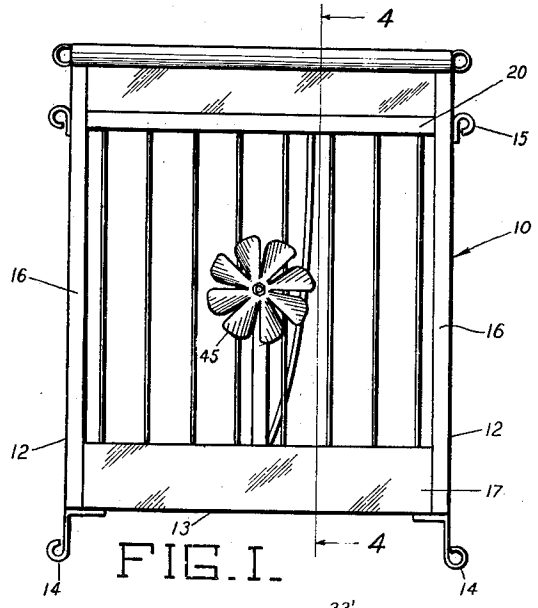
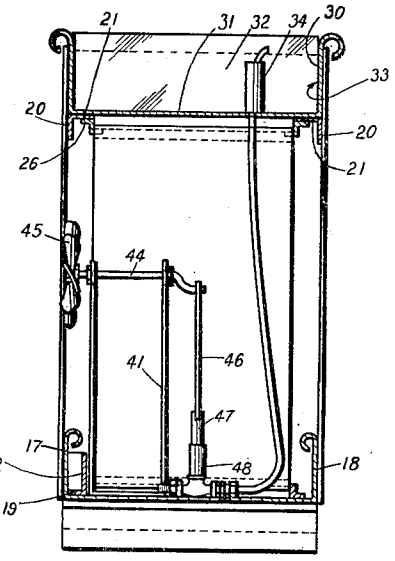


FIG. 1.

FIG. 4.



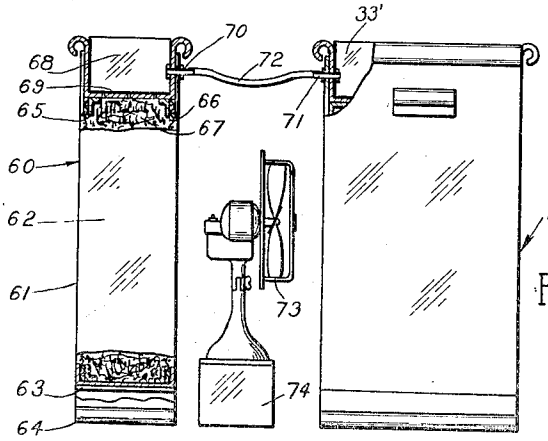


FIG. 9.

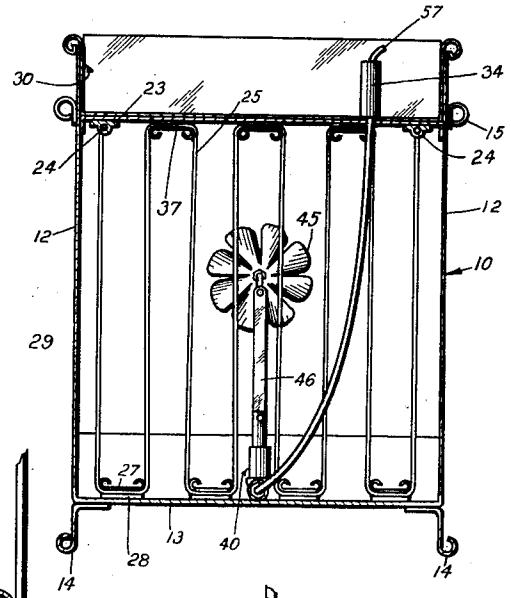
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ATTORNEY.

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PORTABLE AIR CONDITIONING APPARATUS

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FIG. 3.



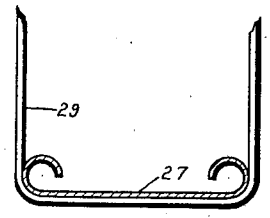


FIG. 6.

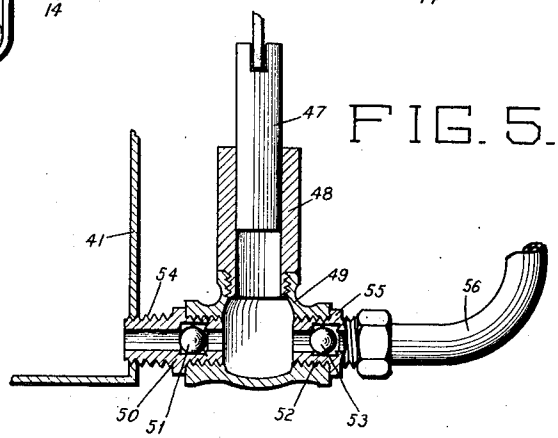


FIG. 5.

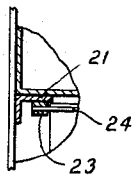


FIG. 7.

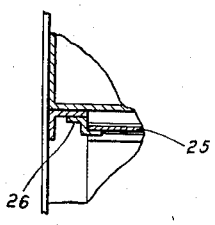


FIG. 8.

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UNITED STATES PATENT OFFICE

2,091,198

PORTABLE AIR CONDITIONING APPARATUS

William H. Fabry, Alhambra, Calif.

Application May 11, 1936, Serial No. 79,015

11 Claims. (Cl. 261—35)

This invention relates to portable air conditioning apparatus.

The general object of the invention is to provide an improved air conditioning apparatus wherein means is provided for conditioning the air in a residence or store building and wherein the current of air is blown over moistened fabric strips.

A further object of the invention is to provide an air conditioning apparatus including fabric strips supported in a novel manner.

Another object of the invention is to provide an improved cabinet for an air conditioning apparatus.

Another object of the invention is to provide an air conditioning apparatus including fabric strips and means to supply water to the fabric strips, together with a receptacle to receive the water from the strips and pump means to return the water to the strips.

Another object of the invention is to provide an air conditioning apparatus wherein air is blown over moistened fabric strips and wherein means is operated by the current of air for causing the water drained from the strips to be returned to the strips.

Other objects and the advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a side view of a portable air conditioning apparatus embodying the features of my invention;

Fig. 2 is a top plan view;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is a section taken on line 4—4 of Fig. 1;

Fig. 5 is a side elevation showing the operation of the pump;

Fig. 6 is a fragmentary, sectional view of the fabric strips and their supporting members;

Fig. 7 is a fragmentary, sectional view showing the end wire members;

Fig. 8 is a fragmentary, sectional view of the fabric supporting members; and

Fig. 9 is a side elevation showing a modification of my invention.

Referring to the drawings by reference characters I have shown my invention as embodied in an air conditioning apparatus which is indicated generally at 10. As shown the apparatus includes end members 12 which are shown as connected by a continuous integral bottom member 13. The bottom member is provided with rolled metal strips 14 which serve as feet while the ends are provided with rolled metal strips 15 which serve as handles. The end members 12 are provided at each side with inturned flanges 16 which extend throughout the length thereof. At the lower ends these flanges 16 are engaged by front and back members 17 and 18, respectively. These front and back members are also secured from the bottom to provide a receptacle 19 which is adapted to serve as a water reservoir.

At their upper ends the ends 12 are connected by transverse members 20 which are secured to the ends and have horizontal portions 21 thereon. The members 20 are spaced apart and adjacent each end are provided with clips 23 which support wires 24. Intermediate the wires 24 I provide spaced fabric strip supporting members 25 which are held in position by brackets 26 at each end thereof.

The bottom 13 is provided with fabric supporting members 27 which are similar to the members 25 and which are held in place by brackets 28. A fabric strip 29 has one end secured to one of the wires 24 whence it passes downwardly over one of the lower supporting members thence upwardly and back and forth until the other end is secured to the other wire 24.

A water receptacle 30 is arranged on the transverse members 20. This water receptacle includes a bottom 31, ends 32, and sides 33 and is provided with a central drain pipe 34. The bottom 31 of the receptacle is provided with apertures 35 which are disposed just above the wires 24 and with other apertures 36 which are disposed above the horizontal portions 37 of the strip 29. The apertures 35 and 36 are of such a size that the water will flow therethrough onto the strips to maintain these strips in a moistened condition so that the water will pass down these strips into the receptacle 19 in the bottom of the air conditioning apparatus.

In order to return the water from the lower receptacle to the upper receptacle I provide pump means which is indicated generally at 40. As shown this pump means includes a U-shaped bracket member 41 which is mounted on a supporting member 42 held on the front 17 of the housing. The U-shaped member is provided with apertures in which a crank shaft 44 is mounted. One end of this crank shaft receives an impeller fan 45 while the crank is connected by a connecting rod 46 with a piston 47 which is mounted on a cylinder 48. The cylinder 48 is connected to a T-fitting 49.

In one leg of the T I arrange a valve seat 50 which is adapted to be closed by a ball valve 51 and in the other leg I arrange a valve seat 52

adapted to be closed by a ball valve **53**. The T is provided with a fitting **54** by which it is connected to the bracket **41**. The T is also provided with a fitting **55** by which it is connected to a pipe **56** which passes upwardly through the overflow pipe **34** and is provided with a discharge outlet **57**. The valve seats **50** and **52** are arranged so that when the piston **47** moves upwardly as in Fig. 5 the ball valve **51** is free from its seat **50** while the ball **53** is down against its seat **52**. Thus water is drawn into the cylinder **48** and when the direction of the piston is reversed the action of the ball valves also is reversed so that the water is forced through the pipe **56** and is discharged into the receptacle **30**.

In the use of my invention the upper receptacle is filled with water and a fan (not shown) is placed in front of the housing. This fan directs air through the housing causing the air stream to impinge on the fabric strips so that the air is conditioned. Also the air causes the impeller to rotate thus actuating the pump by lifting water from the lower container into the upper container thence it passes through apertures **35** and **36** to the fabric strips and then into the lower container.

Fig. 9 shows a modification of my invention in which an air conditioner **10a** which is similar in all respects to the air conditioner previously described is employed in conjunction with an auxiliary air conditioner **60**. This auxiliary air conditioner **60** includes a receptacle frame **61** having sides **62**, a bottom **63**, legs **64**, and receptacle supports **65** which are disposed adjacent the top. The front and the back of the receptacle **61** are closed with wire mesh **66** and are filled with excelsior or other water absorbing material **67**.

On the supports **65** I arrange a container **68** which has a perforated bottom **69** so that the water may drain therefrom into the receptacle. The container **68** is provided with a fitting **70** while the receptacle **33'** of the air conditioner **10a** is provided with a fitting **71** and the fittings **70** and **71** are connected by a rubber hose **72**. An electric fan **73** is shown as mounted on a base **74** between the air conditioner **10a** and the auxiliary air conditioner **60**. When the fan operates the impeller in the air conditioner **10a** operates the pump therein to pump water into the tank **33'** whence it flows through the hose **72** to the container **68** and through the apertures in the bottom **69** onto the excelsior and as the fan draws air through the excelsior the air is moistened before it passes through the humidifier **10a**.

From the foregoing description it will be apparent that I have provided a novel portable air conditioning apparatus which can be economically manufactured and which is highly efficient in use.

Having thus described my invention I claim:

1. In a humidifier, a body including a lower receptacle and an upper receptacle and means to support said receptacles in spaced relation, fabric supports on the upper surface of said lower receptacle and on the lower surface of said upper receptacle, a fabric strip connecting said supports, said upper receptacle having apertures therein disposed above said fabric strips to direct fluid onto the fabric strips, said upper receptacle including an overflow pipe, pump means on the lower receptacle, said pump means including an inlet connected to the lower receptacle and an outlet, a pipe connected to said outlet and including a discharge disposed above the top of and laterally of said overflow pipe and means to drive said pump, said pump driving means including an impeller, said impeller being disposed substantially midway between said upper and lower receptacles.

2. In a humidifier, a body including a lower receptacle and an upper receptacle, means connecting said receptacles, fabric supporting means arranged in pairs on the top of the bottom receptacle and on the bottom of the top receptacle, an endless fabric strip extending over said pairs of supports and extending from the top receptacle to the bottom receptacle whereby horizontally spaced vertical strips are provided and are connected by horizontal top and bottom portions, said upper receptacle having apertures directly above the upper horizontally disposed portions whereby fluid in said apertures will drop onto said upper horizontal portions, a support on said lower receptacle, a shaft mounted on said body, an impeller mounted on one end of said shaft, the other end of said shaft being bent to form a crank, a pump, said pump including an inlet disposed in the lower receptacle, said pump having an outlet connected to the upper receptacle, said pump including an actuating member and means to connect said actuating member to said crank.

3. In an air conditioning apparatus, a body including a lower receptacle and an upper receptacle spaced apart, water absorbing material arranged between said receptacles, an impeller disposed between said receptacles, a pump operated by said impeller and adapted to force water from the lower receptacle to the upper receptacle, an auxiliary air moistener disposed adjacent said body, said auxiliary moistener including a body having a water absorbing material therein, a container disposed above the water absorbing material and having bottom apertures therein and fluid conveying means to connect said upper receptacle to said container.

4. In a humidifier, a body including a bottom, top, and ends, a front and back member at the bottom of the body and cooperating with the ends and bottom to form a receptacle, fabric supporting members extending across the top of the body, other fabric supporting members below the first members and extending across the receptacle, fabric strips arranged over said supporting members and extending from the top members to the lower members whereby horizontally spaced vertical fabric strips are provided, a water supply member having apertures directly above the upper parts of the strips whereby fluid from said apertures will drop onto said strips, a support on said lower receptacle, a shaft mounted on said support, a windmill impeller mounted on one end of said shaft, the other end of said shaft having a crank thereon, a pump, said pump including an inlet disposed in the receptacle, said pump having an outlet connected to said water supply member, said pump including an actuating member and means to connect said actuating member to said crank.

5. In a humidifier, a body including a bottom, top, and ends, a front and back member at the bottom of the body to form a receptacle, fabric supporting members extending across the top of the body, other fabric supporting members extending across the bottom of the receptacle, a continuous fabric strip arranged over said members and extending from the top members to the bottom members whereby horizontally

spaced vertical fabric strips are provided and are connected by integral top and bottom portions, a water supply member having apertures directly above the upper portions whereby fluid from said apertures will drop onto said upper horizontal portions, a support on said lower receptacle, a pump, a windmill impeller, means whereby the impeller drives the pump, said windmill impeller being disposed adjacent to the strips whereby an air stream blowing through and being moistened by the said strips operates said windmill to cause water to be distributed onto the strips, and an inlet for said pump disposed in the receptacle, said pump having an outlet connected to said water supply member.

6. In a humidifier, a body including a bottom and a pair of ends, a front and back member at the bottom of the body and cooperating with the ends and bottom to form a receptacle, a pair of top members connected to said ends, upper fabric supporting members secured to said top members and extending across the top of the body, lower fabric supporting members spaced above the bottom and extending across the bottom of the receptacle, a fabric strip arranged over said supports and extending from the top members to the bottom members, said members being wide to provide horizontally spaced vertical fabric strips which are connected by horizontal top and bottom portions, a water supply member having an aperture directly above the upper horizontally disposed portions whereby fluid from said apertures will drop onto said upper horizontal portions, a pump on said body, a windmill impeller, and means whereby the impeller drives the pump, said windmill impeller being disposed adjacent to the strips whereby an air stream blowing through and being moistened by the said strips operates said windmill to cause water to be distributed onto the strips, said pump including an inlet disposed in the receptacle, said pump having an outlet connected to said water supply member.

7. In a humidifier, a body including a bottom, top and ends, a means at the bottom of the body to form a receptacle, fabric supporting members at the top of the body, other fabric supporting members below the first members and extending across the receptacle, fabric strips arranged over said supporting members and extending from the top members to the lower members whereby spaced fabric strips are provided, a water supply member having a discharge disposed to moisten said strips, a support on said body, a shaft mounted on said support, a windmill impeller mounted on said shaft, a pump fixed on the body, said pump including an inlet disposed in the receptacle, said pump having an outlet connected to said water supply member, said pump including an actuating member and means to connect said actuating member to said shaft.

8. In an air conditioning apparatus, a frame comprising side members and a top and bottom, liquid absorbent material extending between the top and bottom of the frame, a liquid container in the bottom of the frame, a pump for delivering liquid from the container to the upper part of the frame whereby the upper portion of the liquid absorbent material is moistened, and a wind driven impeller for operating said pump upon engagement of an air current therewith.

9. In an air conditioning apparatus, the combination with means for creating an air current, of an upper liquid container, a lower liquid container, a plurality of lengths of liquid absorbent material extending between said containers, a pump for elevating liquid from the lower container to the upper container, means whereby the absorbent material is moistened by the liquid in the upper container, and means engaged by said air current for operating said pump.

10. In an air conditioning apparatus, a frame, a liquid container in the top thereof, a liquid container in the bottom thereof, lengths of liquid absorbent material extending between the top container and the bottom container, means for transferring liquid from the bottom container to the top container, said means comprising a pump and a bladed propeller rotating to drive said pump upon engagement of an air current therewith, and means whereby the absorbent material is moistened by the liquid in the upper container.

11. In an air conditioning apparatus, a frame comprising side members and a top and bottom, liquid distributing material extending between the top and bottom of the frame, a liquid container in the bottom of the frame, a pump for delivering liquid from the container to the upper part of the frame whereby the upper portion of the liquid distributing material is moistened, and a wind driven impeller for operating said pump upon engagement of an air current therewith.

WILLIAM H. FABRY.