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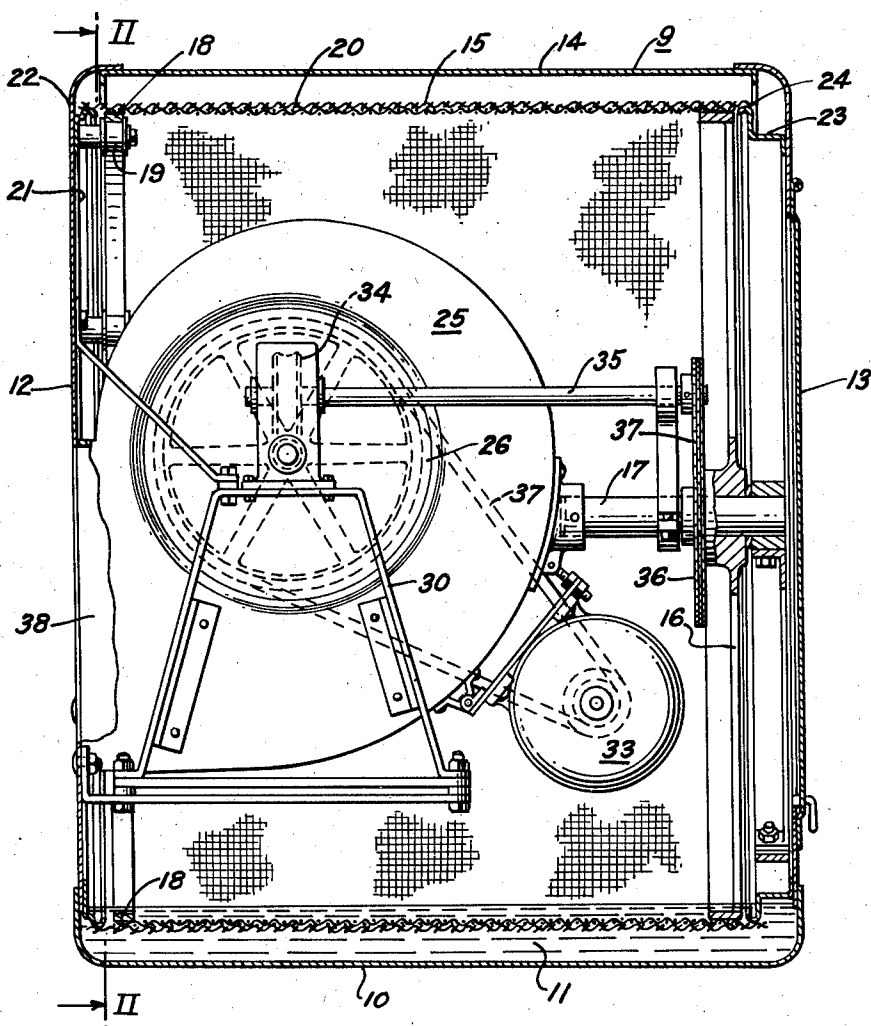
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2,289,983

AIR CONDITIONING APPARATUS

Original Filed March 18, 1940 2 Sheets-Sheet 1

Fig. 1.



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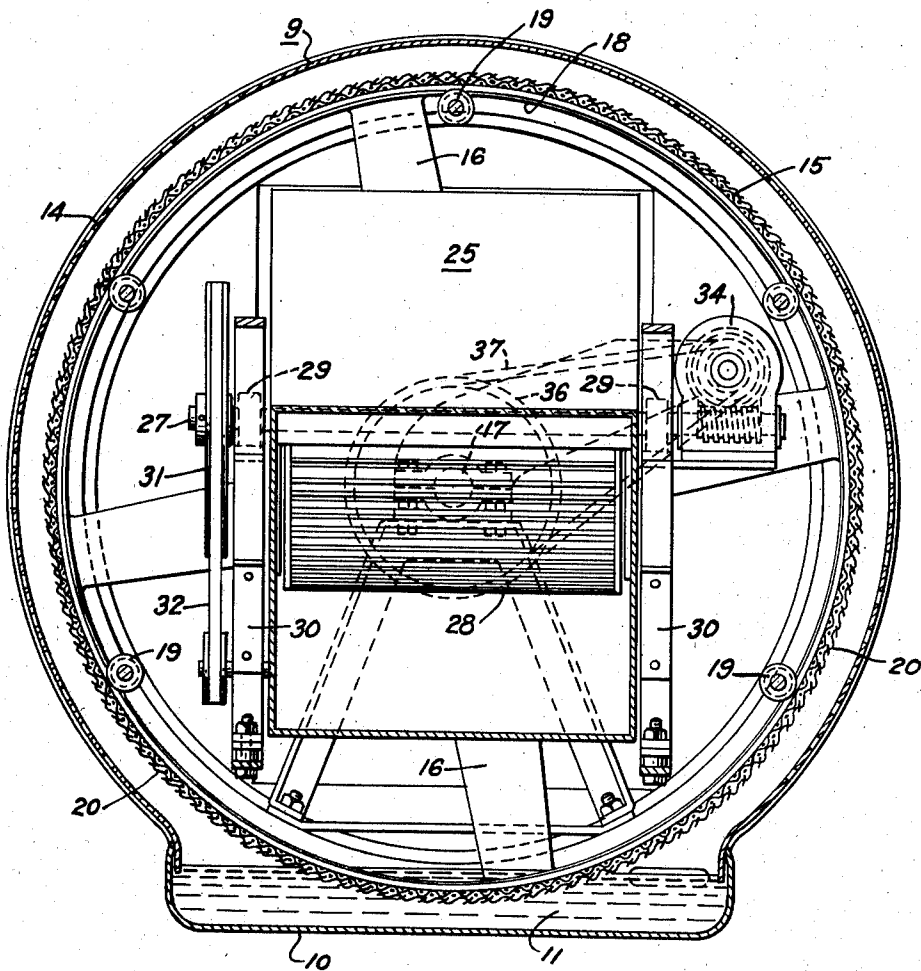
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Fig. 2.



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AIR CONDITIONING APPARATUS

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Original application March 18, 1940, Serial No. 324,552. Divided and this application March 4, 1941, Serial No. 381,653

1 Claim. (Cl. 261—30)

This application is a division of my copending application entitled "Air conditioning apparatus," filed March 18, 1940, and bearing Serial Number 324,552 now Patent No. 2,249,159, dated July 15, 1941.

This invention relates to air conditioning apparatus and is more particularly directed to that general character of apparatus in which the air is passed through a moistened air-pervious medium.

The principal object of the present invention is to provide an improved air conditioning apparatus in which a cylindrical air-pervious, moisture-carrying member is continuously revolved into and out of a pool of air conditioning liquid to progressively moisten said member as it is submerged in the liquid pool and in which the air is circulated through the moistened portion during its travel above the liquid level of the pool, the apparatus thus effecting a continuous and uniform moistening of the member without the necessity of circulating the liquid through the use of a pump or other similar means, and the constant travel of the member through the liquid pool during its submergence therein tending to rinse it free of dust and other foreign matter filtered thereby from the circulated air.

Various apparatus for air conditioning have heretofore been designed to employ stationary curtain members that are moistened by water dripped or sprayed thereon from an overhead reservoir or spray means, the dripped or sprayed water slowly passing downwardly in the curtain material by gravity and capillary action to more or less saturate the curtain material, and the surplus water draining from the lower ends of such stationary curtain members into a drip pan or catch basin from which it is returned by a pump or other similar means to the overhead reservoir or spray means. In apparatus of this character the downward flow of the circulated water through the curtain material is so exceptionally slow that no appreciable rinsing action is effected thereby, and for this reason the stationary curtain members are particularly susceptible of becoming clogged by the dust, lint and other foreign matter which they filter from the circulated air. Also the very fine discharge orifices which must be employed in such drip or spray arrangements may, and often do, become clogged by such dust and dirt as may be entrained by the circulating water.

The improved apparatus herein disclosed overcomes these detrimental characteristics of such prior apparatus by providing a simplified ar-

5 rangement involving a cylindrical element constantly driven to dip into a substantially static pool of liquid and thus become progressively rinsed and moistened thereby, this improved arrangement rendering unnecessary the employ-
ment of water circulating drip or spray systems and stationary curtain members which may be, and frequently are, rendered ineffective by be-
coming clogged.

10 The invention is exemplified in the following description and illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a vertical section through an appa-
ratus embodying my invention.

15 Fig. 2 is a vertical section taken on the line II—II of Fig. 1.

Referring more particularly to the drawings, the cylindrical housing or cabinet 9, in which the mechanism is supported, is preferably formed of sheet metal, the various parts thereof being connected by welding or by other suitable means. Such housing includes a pan-like base 10 which forms a reservoir adapted to contain a pool 11 of water, or other air conditioning liquid, and end walls 12 and 13, respectively. The main portion of the cabinet is a cylindrical or drum-like wall 14, the side portions of which being per-
forated as illustrated.

Arranged concentrically within the housing or cabinet 9 is a hollow cylindrical drum 15, the perimeter of which is preferably formed of rigid, coarsely woven metallic screen material. At one end of the drum it is fitted with a spider 16 which is revolvably mounted on a fixed shaft 17 rigidly positioned within the housing 9. The end of the drum opposite the spider is provided with a circular bearing ring 18 disposed to revolve upon a series of flanged supporting rollers 19 journaled upon the end wall 12 of the housing.

40 Tightly fitting the perforated perimeter of the drum 15 is a circular absorbent member 20 preferably constructed of absorbent fabric. The fabric may be in one or more layers so that it will be of substantial thickness, and the fabric is of such a character as to permit passage of air therethrough without producing any appreciable cavitating or drag effect upon the blower, or such other air circulating means as may be employed. The absorbent member 20 may be secured to the
50 peripheral wall of the drum by any suitable means.

As shown in Fig. 2, the absorbent member 20 is somewhat wider than the length of the drum 15 so that the opposite edge portions thereof extend beyond the ends of said drum for engage-

ment by sealing means. This sealing means includes a sealing ring 21 secured to the end housing wall 12 and having a peripheral bead 22 contacting the overlapping edge portion of the absorbent member 20. A similar sealing ring 23 is secured to the other end wall 13 of the housing and is provided with a peripheral bead 24 contacting the other overlapping edge portion of said absorbent member 20.

A blower 25 is stationarily disposed within the drum 15, and although other types of blower or air circulating means may be employed to produce the desired circulation, it has been found that the more or less standard type of "squirrel-cage" blower illustrated in the drawings is particularly efficient in this situation. In this type of blower the end walls of its casing are provided with air inlet openings 26 about the horizontal impeller shaft 27 of the blower. The impeller 28 of the blower is, of course, secured on this impeller shaft. The impeller shaft is journaled in bearings 29 carried on side brackets 30 which are fixed to the end wall 12 of the housing by suitable structure as illustrated in Fig. 1. The impeller shaft 27 is fitted at one end with a pulley 31, which is driven by means of a belt 32 from an electric motor 33 which is mounted on the casing of the blower 25.

To revolve the drum at a relatively slow rate of speed, the impeller shaft 27 is connected with a speed reduction gear set 34 which in turn drives at a reduced speed a drum drive shaft 35. This shaft, through the medium of a pinion fixed thereto and a gear 36 fixed on the hub of the spider 16 with which it is connected by a chain 37, transmits a drive to the drum.

In operation of the apparatus, the drum will be driven at a very slow rate of speed relative to the speed of the blower impeller, and in its cyclic travel the absorbent member or pad 20 thereon will be caused to move through the liquid in the pan and be progressively rinsed and moistened. As the periphery of the drum and the absorbent member thereon leave the liquid in the pool, it will be moved upwardly adjacent one perforated side wall of the housing past the perforations therein, and downwardly adjacent the opposite side wall of the housing and again enter and be submerged in the liquid pool. This travel of the drum and the absorbent member thereon is, of course, uniform and continuous throughout the operation of the apparatus.

Air is circulated through the apparatus by the blower 25 drawing air inwardly through the perforated walls of the housing and thence through the moistened absorbent member on the drum

into the drum, from whence the conditioned air will enter the blower to be discharged thereby through the discharge opening 38 of the housing and blower.

From the foregoing it will be understood by those skilled in the art that the present invention involves the circulation of air through a continuously travelling cylindrical, moisture-absorbent and air-pervious member which is continuously rinsed and uniformly moistened throughout its travel into and out of a pool of air conditioning liquid.

It will also be understood that while water may be employed as the moistening liquid in the use of the apparatus for ordinary air conditioning purposes, other liquids or solutions may be used to scent or disinfect the conditioned air or to otherwise treat such air for specific purposes.

While I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claim.

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

In an air conditioning apparatus, a cylindrical housing arranged with its axis horizontally, the cylindrical wall of said housing being perforate, an imperforate pan-like base at the bottom of said housing in communication with the interior thereof to contain a pool of air conditioning liquid, said housing having end walls, a hollow cylindrical drum arranged concentrically within the housing, a spider at one end of the drum, a fixed shaft rigidly supported by the adjacent end of the housing upon which said spider is revolvably mounted, a circular bearing ring at the opposite end of the drum, a plurality of supporting rollers journaled on the adjacent end of the housing which said bearing ring revolvably engages, the cylindrical portion of said drum being fitted with a fluid-absorbent fabric, the diameter of the drum being such that it will project into said pan-like base of the housing, a blower stationarily disposed within the drum, supporting means carried by the housing supporting said blower, driving means within said drum for said blower, the end wall of said drum adjacent said circular bearing ring being formed with an opening registering with the discharge opening of the blower, and a driving connection between the blower driving means and said drum for slowly revolving the latter when the blower is in operation.

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