

May 22, 1934.

A. BREITENBACH

1,960,098

HUMIDIFIER OR VAPORIZER

Filed Nov. 30, 1932

Fig. 1.

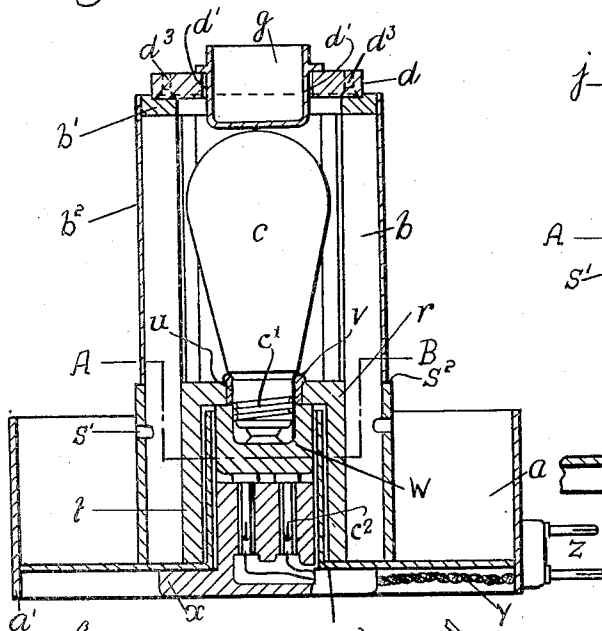


Fig. 2.

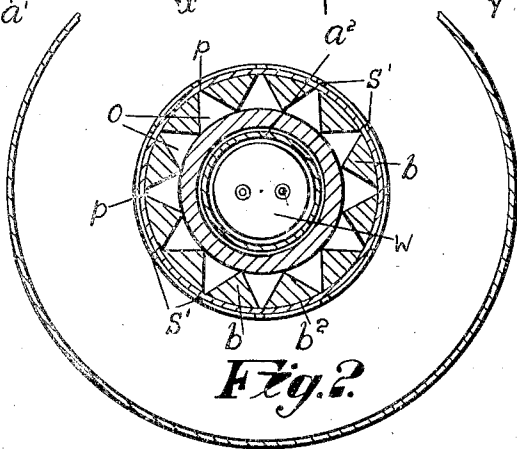


Fig. 4.

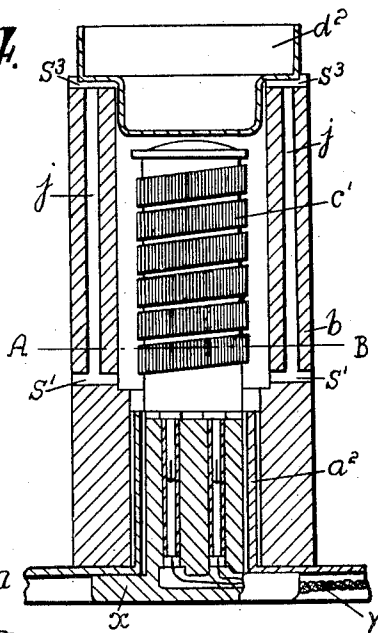


Fig. 5.

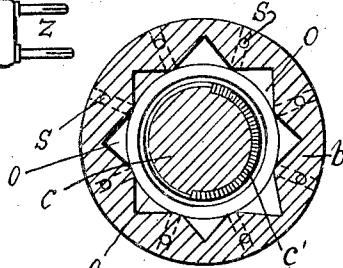
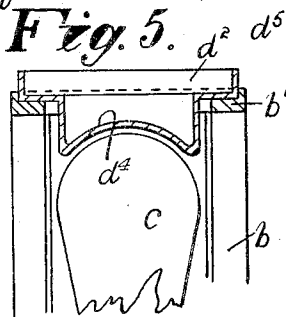


Fig. 3.



Inventor:-

August Breitenbach.

Per:-

George Hughes.

Attorney.

UNITED STATES PATENT OFFICE

1,960,098

HUMIDIFIER OR VAPORIZER

August Breitenbach, Siegen, Germany

Application November 30, 1932, Serial No. 645,067
In Germany May 17, 1932

7 Claims. (Cl. 167—3)

The moisture content of the air in heated spaces is in general too low, whereby human breathing is made difficult and the whole human organism is unpleasantly influenced.

5 To overcome this defect, humidifying devices are used such as clay vessels with water on the stove or heating body, or a flat water vessel with a number of thin superposed plates of porous substance with air spaces between. These devices are dependent in their feeble action, on the degree of the heat supplied.

For special purposes, humidifying devices have been used in which the liquid is boiled in a suitable vessel by a source of heat such as an electrical resistance and thus evaporated.

Finally, air humidifiers are known in which the liquid is absorbed by an absorbent material partly standing or suspended in the liquid and is evaporated by a source of heat acting on the substance.

Air humidifiers of this nature have hitherto only been known for very small vapor outputs as, for example, for humidifying cigar containers. For this purpose, it has been sufficient to use as the absorbent envelope a cylindrical woven wick or a ring of blotting paper, although its vaporizing output was only very small in consequence of its small suction area and the low permissible radiation temperature.

By means of the present invention, on the contrary, the air in living-rooms, public halls, conservatories, and the like, can be kept at a particular degree of moisture. For this purpose, hollow bodies of a highly porous and refractory nature, burnt at a very high temperature, are used which both withstand a radiating temperature of over 1000° C. as well as having a high absorbing capacity surpassing any solid substance hitherto used for this purpose. Such a body of about 8 square inches section, with 4 inch outer diameter, and 7 inches high and approximately 2 inches medium depth of submer-
10 sion, evaporates with a comparatively small heating resistance of 200–300 watt consumption in 10 hours, about 0.35 of a cubic foot of water. Thus, it is possible to use for the heating not only ordinary incandescent lamps as hitherto but also, for example, immersion heaters or other undampened electrical heat resistances or even Bunsen burner gas flames or the like, without
15 damaging the absorbent body. The water, as in the case of the wick or blotting paper, is drawn up into the jacket of the hollow body in a finely divided state and can be brought to the boiling point in this fine subdivision by means of the

radiated heat, and evaporated. When the pores of this burnt hollow body have become fogged, they can be easily cleaned again and attain their former full absorbent capacity by placing them for a short time in, for example, hydrochloric acid.

Not only the evaporation output but also the already high absorbent capacity of the hollow body increases with the strength of the radiation, and this absorbing capacity or output can also be influenced by varying the thickness of the walls of the hollow body or its depth of immersion in the liquid.

The evaporation output is, however, not only dependent on the intensity of the heat radiation but also upon the size of the surface subject to the radiation. Consequently, according to the invention, for the purposes of increasing the output the inner surface of the porous hollow body is increased by its being provided with grooves which may be perpendicular and of triangular section. These grooves may terminate wholly or partially in narrow slots in the outer surface of the hollow body, or if this is not the case, holes may be bored at suitable points, preferably close to the surface of the water, from the outer surface to the base of the grooves, in order to increase the output by circulation of air. The bottom of the hollow body is preferably made hollow to take the fitting for the electric heating body and for the purpose of absorbing air from below into the hollow space, and this to such a height that its upper edge at the highest level of the water is above the surface of the water and the accumulation of liquid in the hollow space is prevented.

The invention, however, refers not only to the formation of water vapor for humidifying the air of rooms and other spaces. A very important part thereof lies in that it provides a new process for cosmetic and healing treatment. This is based on the fact that a mixture of water vapor and vapors of medicinal substances is particularly effective for the above surfaces since the water vapor opens the pores of the skin and expands the vessels of the body, thus facilitating the penetration and the action of medicinal and cosmetic vapors to an important degree. In cosmetics, the favorable action of moist heat on, for example, the color and smoothness of the face is well known, but hitherto very primitive and unpleasant means such as the application of hot towels and the like have been used and there have been no means of obtaining the necessary actions on the body cells and the skin in

such an agreeable and convenient manner and with such durable results as are now made possible by the present invention.

By this process, the cosmetic treatment is effected for example by the renewing or smoothing of flaccid, cracked or friable skin, the removal of blackheads and other skin impurities and the bringing out of a healthy red skin color and the like. As important or even more important, however, are the advantages for healing treatment, for example, in the case of invalids suffering from ailments of the breathing organs such as asthma and diseases of the throat, nose and lungs, by head vapor baths, inhalation of medicinal vapors in the throat and nose, eye vapor baths, medicinal vapor cures for gum and other boils or at points of congestion such as even hemorrhoids or the treatment of gout and kidney complaints and the like. A long list of such possibilities of use might be given.

The process itself consists in producing water vapor in the apparatus described by the aid of the porous body arranged in a water container and heated say by an electrical resistance, and simultaneously evaporating in a bowl exposed both to the heat radiation of the heat resistance as also to the radiation or convection by the water vapor produced, and arranged on or upon the porous body preferably above the heat resistance, medicaments or a mixture of medicaments or other ingredients with water, allowing this vapor to mix with the water vapor and conveying the mixture by suitable means, as for example, hoods for vapor baths, inhalation funnels or the like, to the parts to be treated in order, according to circumstances, to let the vapor mixture act alone or to be assisted in its action by massage. The heating of the bowl is so intense that the contents thereof come to the boil in a short time. Naturally, the apparatus can be used not only for warming or heating medicaments but also for that of luxuries such as coffee, tea, milk or even foods.

The evaporating capacity can be regulated by more or less raising or lowering the porous cylinder by simple suitable means or devices and thus varying the distance from the vessel to the heating resistance, or by using heating resistances of varying heat output. In such manner, the temperature and degree of saturation of the water vapor are regulated in known dependence on each other.

Various embodiments of apparatus according to the present invention are shown as examples on the accompanying drawing.

Fig. 1 shows an example with a small evaporating bowl in sectional elevation.

Fig. 2 shows the same in cross-section on line A—B of Fig. 1.

Fig. 3 is a partial vertical section of the same example with a larger fitted bowl replacing the cover.

Figs. 4 and 5 are vertical and cross-sections respectively of a somewhat altered embodiment of the hollow body.

Fig. 5 being a section on the line A—B of Fig. 4. Referring to the drawing, a is a liquid container of any shape with a depending circular foot rim a' or with separate feet and with an inner concentric tubular part a^2 . b is a tubular porous hollow body burnt at a high temperature which is provided with V section grooves o in its inner surface extending from the bottom of the porous body b to an integral annular top part b' . These grooves o have their apices intersected by the

periphery of the hollow body from an annular ledge s^2 up to the top b' whereby a plurality of narrow vertical slits p are formed in the hollow body. The diameter of the hollow body is enlarged from the annular ledge s^2 downwardly to hold together the segments formed by the grooves o . c is the heating body, for example, an electric carbon filament lamp (Fig. 1) or an open undampened heating resistance (Fig. 4). The tubular part a^2 of the liquid container is slightly higher than the outer wall of a and serves as an inner guide to the hollow body b , the base of which has an integral concentric cylindrical part t fitting over the tubular part a^2 . A concentric annular part r of the porous body b is formed with a central hole u into which is inserted the heating body c insulated by a porcelain or like ring v . A socket w receives the lamp plug c' and has a pair of plugs c^2 inserted in tubular terminals in a socket x , from which the conductors y lead to the outer plug z for connection with the lighting mains.

An annular cover d , which preferably is also porous, is fitted into the top b' of the porous body and is provided with a central opening d' , into which is inserted a small vessel g of metal, porcelain, glass or the like, to take the medicaments to be evaporated.

For the vaporization of medicaments, this small vessel g will, in general, suffice. For heating milk, tea or the like, it will be advisable to have a larger bowl d^2 , according to Figs. 3 and 4, which is fitted in place of the cover d , or to use any desired suitable kitchen appliance, say, of aluminium.

If it is desired principally to vaporize medicaments, then in order to prevent the loss of heat through the grooves o , p a jacket b^2 may be placed round the body b , such jacket resting upon the annular ledge s^2 and being made of suitable heat resisting and heat insulating material which may be reinforced by metal sheeting and which can be put on and taken off as desired. Holes s' may pass radially through the lower part of the body b into the grooves o , and like holes can be formed in the jacket b^2 which can be removed from the body b or placed about it as required. The jacket b^2 for this purpose has a skirt extending down over the holes s' .

Instead of the grooves o and holes s' , there may be provided for the purpose of air circulation only perpendicular holes j and horizontal corresponding or intersecting holes s' , which, if necessary, can pass through the whole wall of the hollow body as shown in Fig. 4.

By means of this apparatus, it is possible to produce a mixture of medicinal vapors with more or less water vapor. The smallest mixture of water vapor is obtained when the hollow body b and the cover d have no open air circulation holes at all. The cover d may also be provided with holes d^3 which align with the grooves o or the holes j of the hollow body. This alignment may be adjustable by rotating the cover d as the less the holes in the cover align with the grooves o or holes j , the more will the vapor withdrawal from the hollow body be throttled and the hotter and drier will be the vapor.

In place of the ventilating holes in the cover, slots s^3 may be made in the upper annular edge of the porous body as shown in Fig. 4.

If it is desired to produce only water vapor without medicaments, then the bowl g may be taken out and the opening d' be left open or a cover d be used without an opening such as d' .

but which may be provided with a number of small holes through which the vapor flows out well distributed. Owing to the strong upward current in the highly heated hollow body, there rises from this a clearly visible vapor column up to 100 inches high which distributes itself above and then, in consequence of the gradual cooling, again sinks and fills the whole room and regenerates its atmosphere.

If desired a cover such as d^2 shown in Fig. 3 may be fitted directly into the porous body b and formed with a spherical base d^4 contiguous to the top of the lamp c and with a shallow annular part d^5 resting on the top of the member b to obtain a larger capacity receptacle.

It is, of course, also possible to use an independent lamp or other heating body, or a Bunsen burner of usual character such as used in house-keeping, and to place the rest of the apparatus, that is, the vessel a with the hollow body b and all accessories simply over this.

By enlarging the inner surface of the body b with the grooves o a large radiation and evaporation surface is provided. The holes s' being located near the lower end of the body b allow air to enter the hollow body which can circulate upwards.

What I claim is:—

1. Means for humidifying air, cosmetic, heating and like treatment by humidification comprising a vertical hollow liquid absorbent body of a highly refractory nature burnt at a high temperature, a vessel containing liquid and in which one end of said body is dipped, an electrical heat resistance accommodated within said hollow body, vertical grooves in the inner surface of said hollow body and narrow apertures at the outer ends of said grooves.

2. Means for humidifying air, cosmetic, heating and like treatment by humidification comprising a vertical hollow liquid absorbent body of a highly refractory nature burnt at a high temperature, a vessel containing liquid and in which one end of said body is dipped, an electrical heat resistance accommodated within said hollow body, vertical grooves in the inner surface of said hollow body, narrow apertures at the outer ends of said grooves and radial apertures in the hollow body corresponding with said vertical grooves.

3. Means for humidifying air, cosmetic, heating and like treatment by humidification comprising a vertical hollow liquid absorbent body of a highly refractory nature burnt at a high temperature, a vessel containing liquid and in

which one end of said body is dipped, an electrical heat resistance accommodated within said hollow body, vertical passages through said hollow body and radial apertures in said hollow body corresponding with said vertical passages.

4. Means for humidifying air, cosmetic, heating and like treatment by humidification comprising a vertical hollow liquid absorbent body of a highly refractory nature burnt at a high temperature, a vessel containing liquid and in which one end of said body is dipped, an electrical heat resistance accommodated within said hollow body, vertical grooves in the inner surface of said hollow body, narrow apertures at the outer ends of said grooves, radial apertures in the hollow body corresponding with said vertical grooves, and a rotary cover fitted over said body and formed with openings adapted to register with said radial apertures.

5. Means for humidifying air, cosmetic, heating and like treatment by humidification comprising a vertical hollow liquid absorbent body of a highly refractory nature burnt at a high temperature, a vessel containing liquid and in which one end of said body is dipped, an electrical heat resistance accommodated within said hollow body, vertical passages through said hollow body and radial apertures in said hollow body corresponding with said vertical passages, and a rotary cover fitted over said body and formed with openings adapted to register with said radial apertures.

6. Means for air humidification, cosmetic, heating and like treatment comprising a highly porous and refractory body, vertical passages in said body, a water container receiving part of said body, means for heating such body, a cover member fitted on top of said body and a vessel removably fitted therein so that it is mounted above said porous body and heating means and is adapted to receive a liquid which is exposed to the radiation of heat from said heating means and the radiation and convection of vapor from the water, and apertures in said cover adapted to register with said vertical passages.

7. Means for air humidification, cosmetic, heating and like treatment comprising a highly porous and refractory body, a water container receiving part of said body, means for heating such body, a cover member fitted on top of said body, a plurality of small holes therein and corresponding vertical holes in said hollow body, said cover being rotatable for varying the registration of said holes.

AUGUST BREITENBACH.

60

135

65

140

70

145

75