

Feb. 13, 1940.

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2,190,168

APPARATUS FOR THE DRYING OF THE HAIR

Filed April 30, 1938

2 Sheets-Sheet 1

Fig. 1.

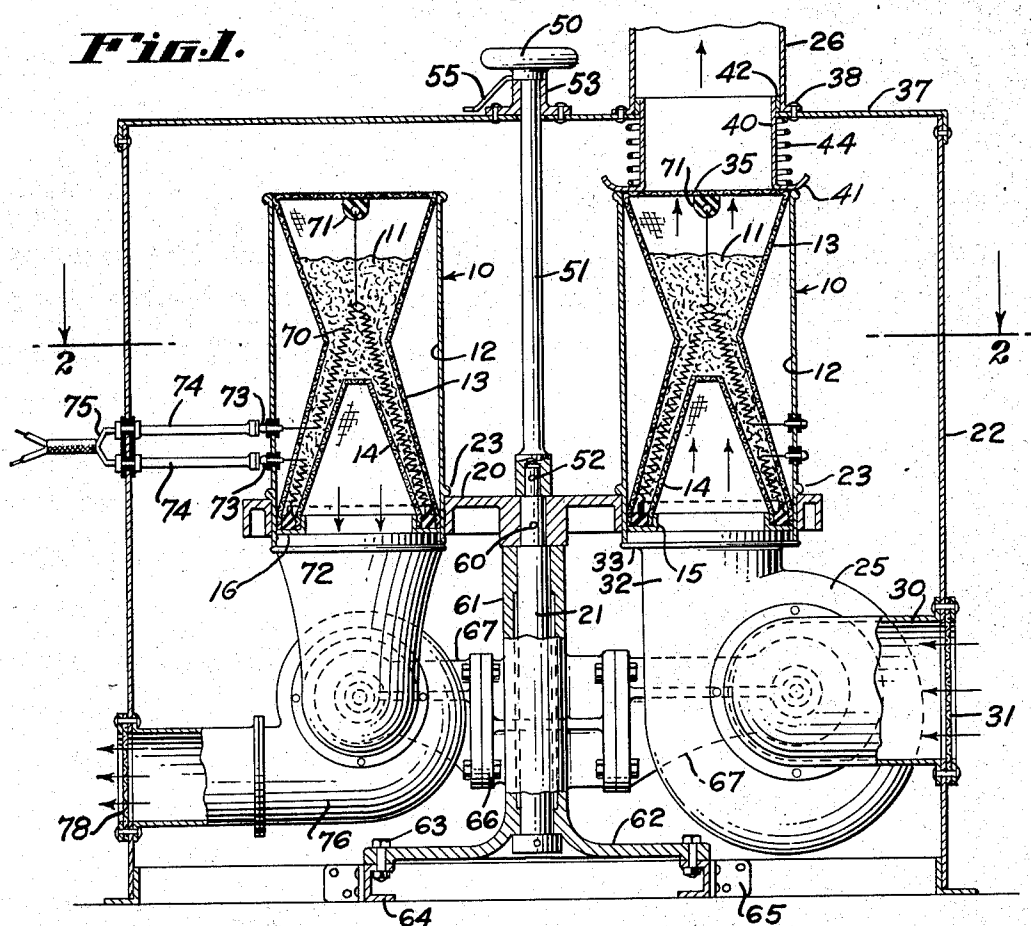
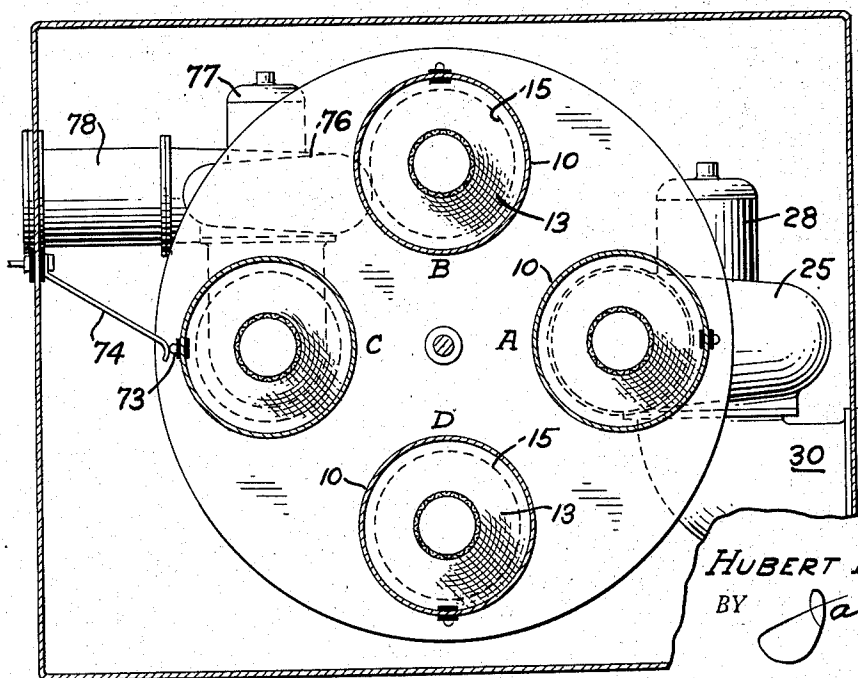


Fig. 2.



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2 Sheets-Sheet 2

Fig. 3.

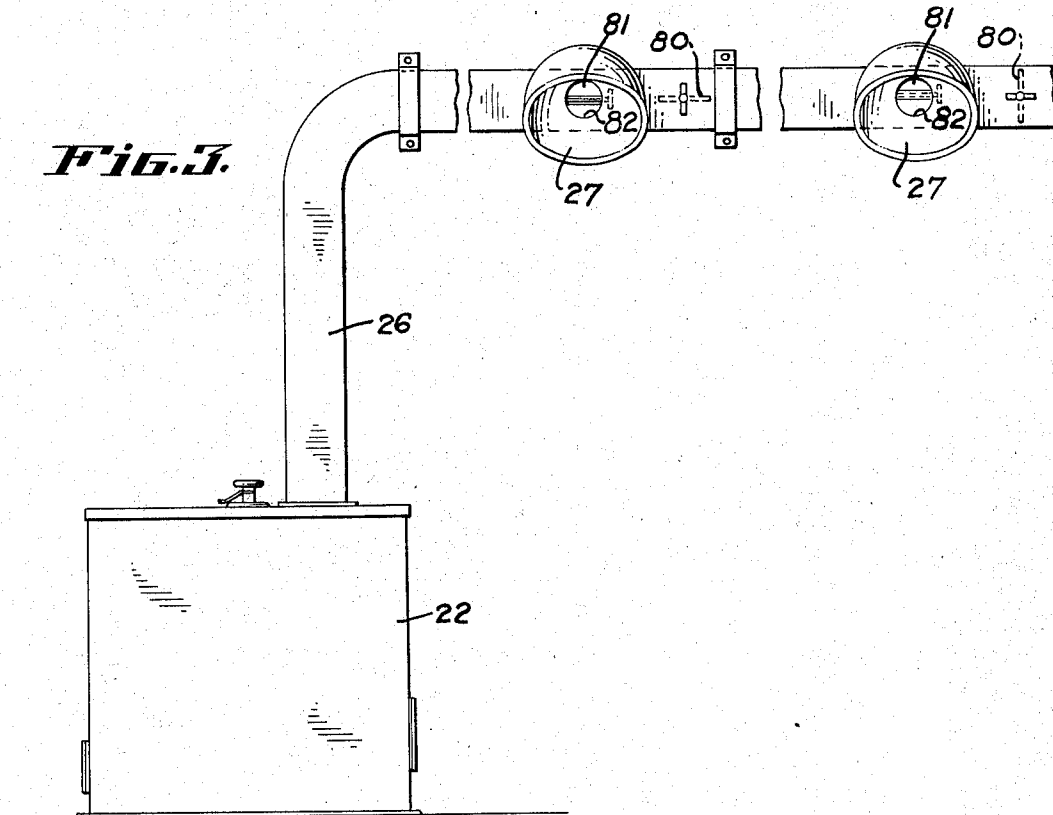
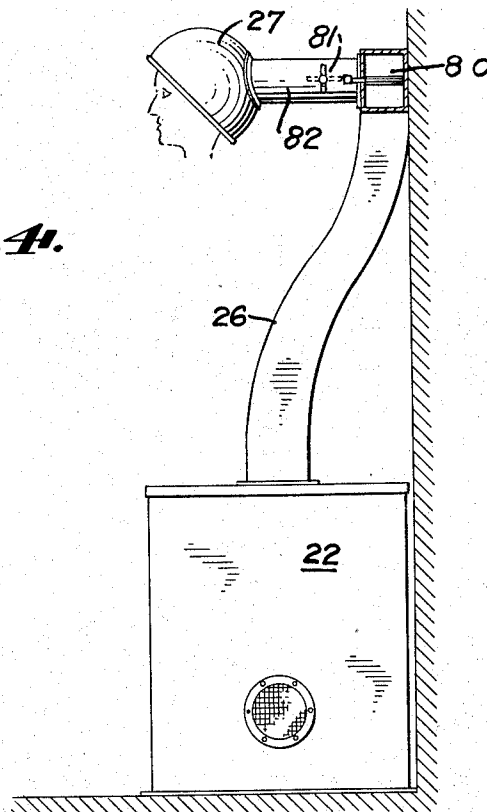


Fig. 4.



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APPARATUS FOR THE DRYING OF THE HAIR

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4 Claims. (Cl. 34—26)

This invention relates to an apparatus for the drying of the hair and has for one of its objects the provision of such an apparatus as would be suitable for use in a beauty parlor.

5 It is a commonly known fact that in present day beauty parlor operation one of the most vexatious problems encountered is the drying of the hair following shampooing or permanent waving thereof. The methods and devices now in
10 use necessitate subjecting the customer to extremely long periods of discomfort while the hair is being dried. It is not uncommon for the drying process following a shampoo to consume in excess of an hour, during which the customer must remain in one position and exposed to the particular drying means employed. Then, too, most
15 of the prior art structures and methods utilize air streams of extremely high temperature to attain the desired objective, occasioning the use of such auxiliary equipment as ear protectors and the like to obviate burns. All of these deficiencies of the prior art result in too much of a hardship on the customer and are the cause of many complaints.

25 The present invention concerns itself with the provision of a simple apparatus for the hair drying step in beauty parlor operation which will overcome the objections heretofore pointed out. Additionally, the objects of the invention are sought to be attained through the provision of a relatively inexpensive method and means.

30 In general the present invention seeks to accomplish its purpose by the use of a dehumidified air stream which is directed upon the head of the customer to effect quick drying of the hair and a simplified means for providing such conditioned air.

35 Other objects will become more apparent as the specification proceeds and the novelty of the invention will be particularly pointed out in the appended claims.

In the drawings forming a part hereof:

Figure 1 is a vertical section of an air dehumidifying device embodying my invention,

45 Figure 2 is a section taken along the line 2—2 of Figure 1,

Figure 3 is a front elevation of a hair drying unit embodying my invention, and

50 Figure 4 is a side elevation of the subject matter of Figure 3.

In the preferred form of my invention illustrated I use a cartridge 10, containing an adsorbent material 11, through which a stream of air is passed for dehydration and use in the hair drying
55 process.

One adsorbent material suitable for the herein described uses is composed of aluminum oxide, in porous, amorphous form, with minor amounts of hydrated alumina and very small amounts of soda and oxides of iron, silicon and titanium, substantially all of the soda being combined with silica and alumina as an insoluble compound. This preparation is commercially available in granular form and there are doubtless many other preparations having similar characteristics which would be suitable.

It will be noted (Figures 1 and 2) that a plurality of these cartridges are employed in order that operation of the apparatus may be constant through reactivation of the adsorbent material in several cartridges while one is in use for the purpose intended.

The cartridge 10 comprises an open-ended cylinder 12 having fixed therein a material container 13 of wire mesh or other foraminous material, the latter being of substantially an hour-glass construction, in which the two cones would have equal capacity, the lower cone of the container 13 is provided with a concentrically arranged cone 14, likewise of wire mesh, which is joined in a materially tight connection to the bottom edge of the container 13, as at 15. An inwardly projecting lip 16, at the bottom of cylinder 12, serves to support the container 13 within the cartridge. As will be noted from Figure 1, due to the construction of the container 13, the material 11 when placed therein will fill the area between the lower half of container 13 and the concentric cone 14 and a portion of the upper half of container 13.

35 In the preferred form of the invention illustrated in the drawings, I show four of the cartridges 10 mounted on a turntable 20, on shaft 21, within a cabinet 22. As stated, this construction permits continuous operation of the device, i. e., while the activated material 11 within one of the cartridges 10 is being utilized for its adsorbent properties, used cartridges may be reactivated. An annular shoulder 23 on cylinder 12 abuts the top of turntable 20 and supports the cartridge in the desired position.

In Figure 1 of the drawings, a cartridge 10 is shown in position between a blower 25, of conventional design, and a conduit 26 leading to the drying hoods 27. The blower 25, driven by a prime mover 28, such as a conventional electric motor or like means, has an intake 30 through the wall of the cabinet 22 which intake is provided with a suitable screen 31 to exclude foreign matter from the apparatus. The blower 25

has an upwardly extending neck portion 32, flared as at 33 for frictional engagement with the bottom of cartridge 10. It will be appreciated that the connection between the flare 33 of the neck portion 32 and the bottom of the cartridge 10 should be as air-tight as permissible since the material 11 offers resistance to the air stream.

In practice it will be found that an air stream from the blower 25 sufficient for the air drying process will be sufficient to lift the material 11 within the container 13. To avoid any possibility of the material 11 being forced or driven into the conduit 26 there is provided a materially tight screen top 35 for the container 13.

A unique arrangement is provided for the establishment of communication between cylinder 10 and conduit 26 as will be seen from Figure 1. Conduit 26 terminates at and is secured to the top 37 of cabinet 22 by any conventional means such as rivets 38. The conduit is in registry with an aperture in said top of slightly smaller diameter than the conduit 26. An extension conduit pipe 40, one end of which is telescopically received by conduit 26 projects through the aperture in the cabinet top 37 and has a flared mouth 41 for engagement with the top of the cartridge 10. A washer 42 on the upper end of the extension conduit 40 serves to make the connection with the conduit 26 sufficiently air-tight and at the same time retains the said member 40 within conduit 26 by abutting the rim about the aperture in top 37. Extension member 40 is normally urged outwardly from conduit 26 and into the path of cartridges 10 by means of a circumferentially arranged coil spring 44 between top 37 and the flared mouth 41. It will thus be seen that when turntable 20 is rotated and a cartridge 10 is swung between the extension 32 of blower 25 and extension member 40, the top thereof will be brought into engagement with the flanged mouth 41 of extension 40 and force the same upwardly against the urge of spring 44. This frictional engagement between the top of cartridge 10 and the flared mouth of extension 40 will be sufficiently air-tight, considering the pressures involved.

When the adsorbent material 11 within a given cartridge 10 has reached the limits of its adsorbent properties, the turntable upon which it rests is turned counter-clockwise (looking at Figure 2) to move it from position A to position B and thereby bring a reactivated cartridge from D into position A. This movement of the cartridges is accomplished through the provision of a hand wheel 50 on top of the cabinet 37 suitably connected to shaft 21 by means of rod 51 pinned to the reduced end of the shaft 21, as at 52. Figure 1 illustrates a bearing or spacing member 53 on rod 51 between hand wheel 50 and the cabinet top 37, to the latter of which it is affixed by conventional rivets. Hand wheel 50 carries a finder 55 downwardly bent to overlay an area of cabinet top 37 upon which any conventional scale or indicia may be disposed for the purpose of indicating the position of the respective cartridges 10. It will be apparent that the form of my invention illustrated might readily be equipped so that the shifting of the cartridges from operative to inoperative positions might be fully automatic and not dependent upon attention by the operator of the machine without departing from the spirit of this invention and as a matter of personal choice.

It will be noted (Figure 1) that turntable 20 is keyed to a reduced portion of shaft 21, as at 60,

and that the said shaft is journaled in a sleeve 61, the top of which provides a bearing surface for the hub of table 20. The bottom of the sleeve 61 is flared outwardly into a skirt 62 which is bolted, as at 63, to a support 64 secured to the base of the cabinet 22, as at 65. Additionally, sleeve 61 has a pair of integral shoulders 66 to which the supporting brackets 67, for blowers 28 and 76, are bolted.

The reactivation of the adsorbent material 11, within the cartridges 10, is accomplished through the provision of the following means: A suitable electrical heating unit 70 is disposed within the foraminous container 13, being suspended between the insulating button 71, of mica or some other material having like properties, secured to the top 35, and like insulating buttons 72 at the bottom of container 13. The heating element 70 is connected with contact button 73 projected through the wall of the cartridge 10 (see Figure 1). When a cartridge 10 is turned into position C (Figure 2) the contact button 73 is brought into frictional engagement with the contact bars 74 secured to the wall of the cabinet 22 and heating element 70 is energized by current from leads 75.

The function of the electrical heating unit 70 within the containers 13 is to remove collected moisture from the adsorbent material 11 during the regenerating cycle. It will be noted from Figure 1 that the heating units are embedded in the adsorbent material 11. The heat therefrom vaporizes the moisture collected by the adsorbent material 11 when cartridge 10 was in position A (Figure 2) and these vapors are drawn off by a suction fan 76, having a conventional prime mover such as an electrical motor 77, and are exhausted through the aperture 78 in the wall of the cabinet 22 to the atmosphere.

Operation

It will be understood from the foregoing description that the operation of the subject matter of my invention is as follows: A cartridge 10 containing an activated charge of adsorbent material 11 is turned into position A (see Figure 2). The blower 25 is started and draws air through the screened aperture 30 in the wall of cabinet 22 driving the same to cartridge 10.

The air entering cartridge 10 passes through the adsorbent material 11 substantially as indicated by the arrows in Figure 1. Air pressure sufficient for the hair drying process will lift some of the material 11 upwardly against the top 35 of container 13 thus providing a final screen through which the air must pass in this dehydrating step. The conditioned air leaving cartridge 10 passes through the extension conduit 40 and conduit 26 to one or more drying hoods, such as those illustrated at 27, in Figure 3. A series of dampers 80 in conduit 26, adjacent the connected drying hoods 27, permit regulation of the flow of the conditioned air. Similarly, dampers 81, in connecting conduits 82, provide control means for the flow of air from each of the drying hoods 27.

When the adsorbent material within a cylinder 10 has reached the saturation point hand wheel 50 is turned to move it out of position A for substitution of a regenerated cartridge. The used cartridges progress to position C for removal of moisture by heating element 70 and fan 76, and then to the cooling position D in readiness for further use.

While in the device illustrated in the drawings

and heretofore described in the specification comprise a combination in which air is blown through the cartridge 10 of adsorbent material 11 to the drying hoods 27, it may be preferable to use a suction pump or fan to suck air through the cartridge 10 of adsorbent material 11 to drying hood 27. Such a structure would insure against the possibility of pulverizing the adsorbent material 11 which is likely to occur where the same is repeatedly agitated. It is obvious that if air were drawn downwardly through the material 11 in cartridge 10 by a fan such as 76 and from thence directed to the drying hoods 27, the material 11 would remain constant in semi-packed condition. This proposal is deemed well within the spirit of the invention as shown and described herein since the mechanism illustrated in Figure 1 of the drawings reveals a simple means of reversing the direction of the air stream through material 11 in cartridge 10, comprising fan 76 utilized in re-activation of material 11 (see left-hand side of Figure 1).

While I have shown and described an apparatus which will deliver conditioned air at the drying hood at substantially room temperature, experience has dictated the necessity of raising the temperature of the air stream to substantially body temperature for the comfort of the persons being treated. This can be very easily arranged by providing a heating coil in conduit 26 or the hood 27, having temperature control means. On the other hand it may be as acceptable to simply place an electric light globe somewhere in the air stream to raise the temperature to a desired level.

It will be appreciated from the foregoing that my apparatus is subject to many changes and modifications, to meet various conditions and individual preferences, without departing from the spirit of the invention. Therefore, I do not limit myself to that which is shown and described only, but desire protection according to the scope of the appended claims.

The invention claimed is:

1. In a hair drying apparatus the combination of a drying hood, a conduit therefor, blower means, cartridges containing a moisture absorbent material adapted to be moved into position between said conduit and said blower means, rotatable means for effecting said movement of said cartridges, electrical heating elements for

said adsorbent material within said cartridges, means for energizing said heating elements when said cartridges are moved into inoperative position, and means for drawing off the vapors created by the heating of said adsorbent material.

2. In a hair drying apparatus the combination of a drying hood, a cabinet, a conduit for said drying hood extending into said cabinet, blower means within the cabinet, a plurality of cartridges containing a moisture adsorbent material adapted to be moved into position between said conduit and said blower means, rotatable means for effecting said movement of said cartridges, means on said cabinet for indicating the relative positions of said cartridges, electrical heating elements for said adsorbent material within said cartridges, means for energizing said heating elements when said cartridges are moved into inoperative position, and means for drawing off the vapors created by the heating of said adsorbent material.

3. In a hair drying apparatus the combination of a drying hood, a cabinet, a conduit for said drying hood extending into said cabinet, blower means within the cabinet, a plurality of cartridges containing a moisture adsorbent material, rotary supporting means for said cartridges, means for selectively moving said cartridges into position between said conduit and said blower means, each of said cartridges having a self-contained electrical heating element, and means for energizing said heating elements when said cartridges are moved into inoperative positions.

4. In a hair drying apparatus the combination of a drying hood, a cabinet, a conduit for said drying hood extending into said cabinet, blower means within the cabinet, a plurality of cartridges containing a moisture adsorbent material, rotary supporting means for said cartridges, means for selectively moving said cartridges into position between said conduit and said blower means, each of said cartridges having a self-contained electrical heating element, each of said heating elements having a pair of contact points projecting through the wall of said cartridges, and a pair of contact bars fixedly connected to a wall of said cabinet and adapted to engage the contact points on said cartridges as they are selectively moved into an inoperative position.

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