

March 9, 1937.

J. C. CROWLEY

2,073,401

DRIER

Filed May 11, 1932

2 Sheets-Sheet 1

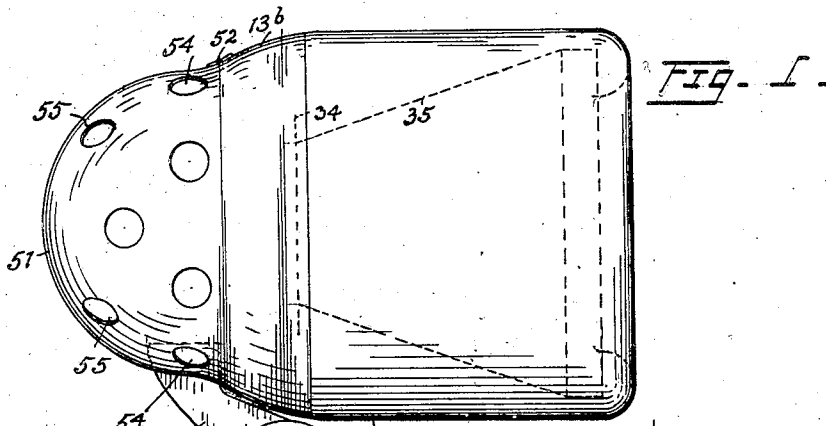


Fig. 1.

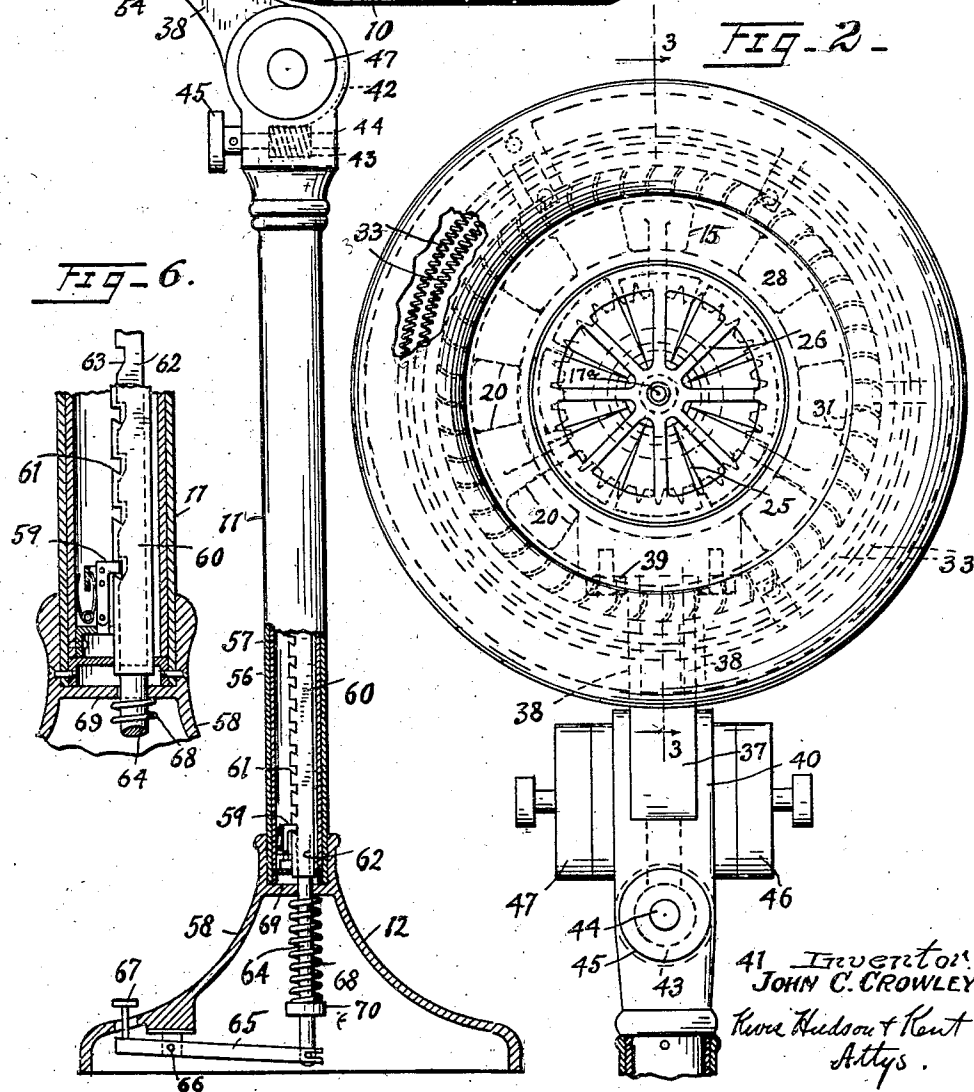


Fig. 2.

Fig. 6.

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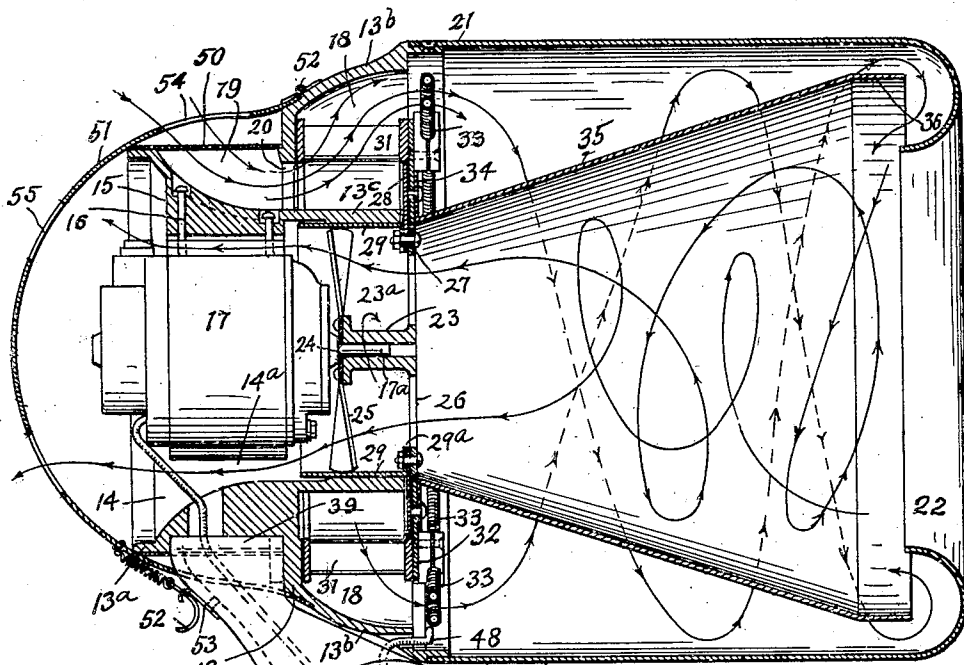


Fig-3-

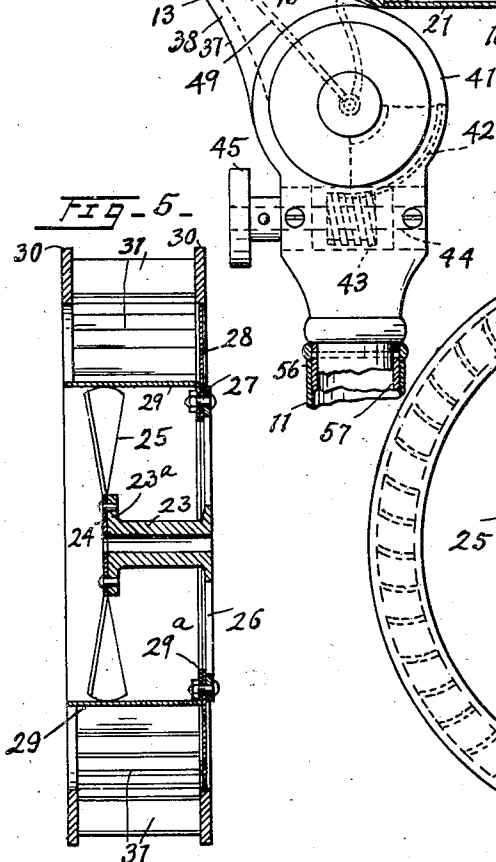


Fig-5-

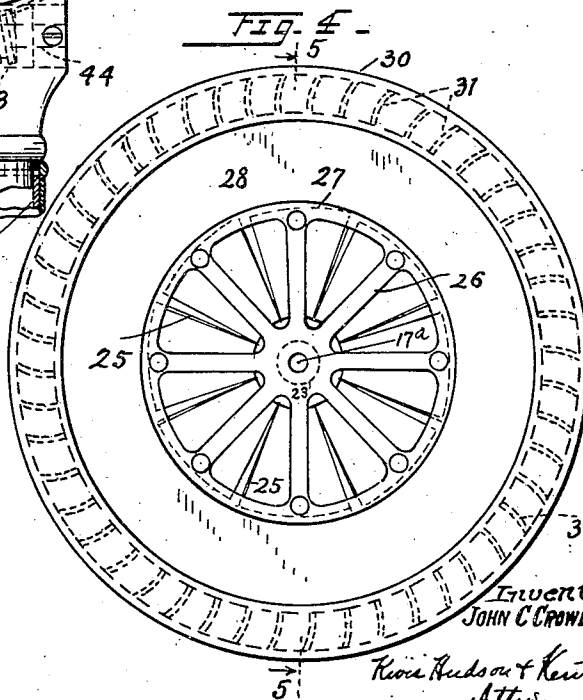


Fig. 4.

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UNITED STATES PATENT OFFICE

2,073,401

DRIER

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Application May 11, 1932, Serial No. 610,615

10 Claims. (Cl. 34—26)

This invention relates to a drier and particularly to a drier especially adapted for use in drying the hair and scalp, such driers being ordinarily found in beauty shops, barber shops and similar places, although, of course, susceptible of advantageous use in a number of other places.

It may be broadly stated that there are two general types of driers of this character in use at the present time, namely, the direct type of drier and the recirculating type of drier.

In the direct type of drier air is drawn into the drier by means of a fan and, after passing over a heating element, is discharged from the open end of the hood of the drier upon the head of the person being treated. This type of drier has the disadvantage of drying the hair from the outer end thereof inwardly toward the scalp and the advantage of utilizing fresh air throughout the drying operation.

The recirculating type of drier operates on a different principle from the direct type in that substantially the same air is circulated over and over again within the hood of the drier. The advantage of the recirculating type of drier resides in the fact that the hair of the person being treated is dried from the scalp outwardly toward the outer ends of the hair. However, the recirculated air in this type of drier soon becomes saturated with moisture and the time required for the drying operation is thereby materially increased.

The main object of the present invention is to provide a drier of the character specified which will dry the hair from the scalp outwardly, as in the recirculating type of drier above mentioned, and will also use fresh air throughout the drying operation as in the direct type of drier.

Another object of the invention is to provide a drier which is so constructed that fresh dry air will be the active drying medium throughout the drying operation.

A further object of the invention is to provide a drier in which the circulated air will be free from dirt and foreign substances, as well as free from moisture.

A more specific object of the invention is to provide a drier wherein the air is drawn into and discharged from the drier at a point remote from the open end of the hood of the drier.

A further object of the invention is to provide a drier wherein the path of the circulated air is inwardly of the drier from adjacent the rear end thereof, forwardly therethrough to a point adjacent the open end of the hood, then rearwardly therethrough and out to atmosphere at a point remote from the open end of the hood.

Another object is to provide a drier which is of simple construction, is efficient in operation,

and has the necessary facilities for all the adjustments required in actual use.

Additional and further objects of the invention will be pointed out hereinafter during the following detailed description of an embodiment of the invention, which is illustrated in the accompanying drawings, wherein,

Figure 1 is a side elevational view of a drier constructed in accordance with the present invention, a portion of the supporting standard for the drier being shown in section;

Fig. 2 is a fragmentary end view of the drier shown in Fig. 1 looking from the right-hand side of said figure, certain portions being broken away to illustrate parts of the drier lying therebehind;

Fig. 3 is a fragmentary view of the drier, partly in section and partly in side elevation, the section through the drier head being a vertical longitudinal section taken substantially on line 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a detail end elevational view of the fan used in the drier;

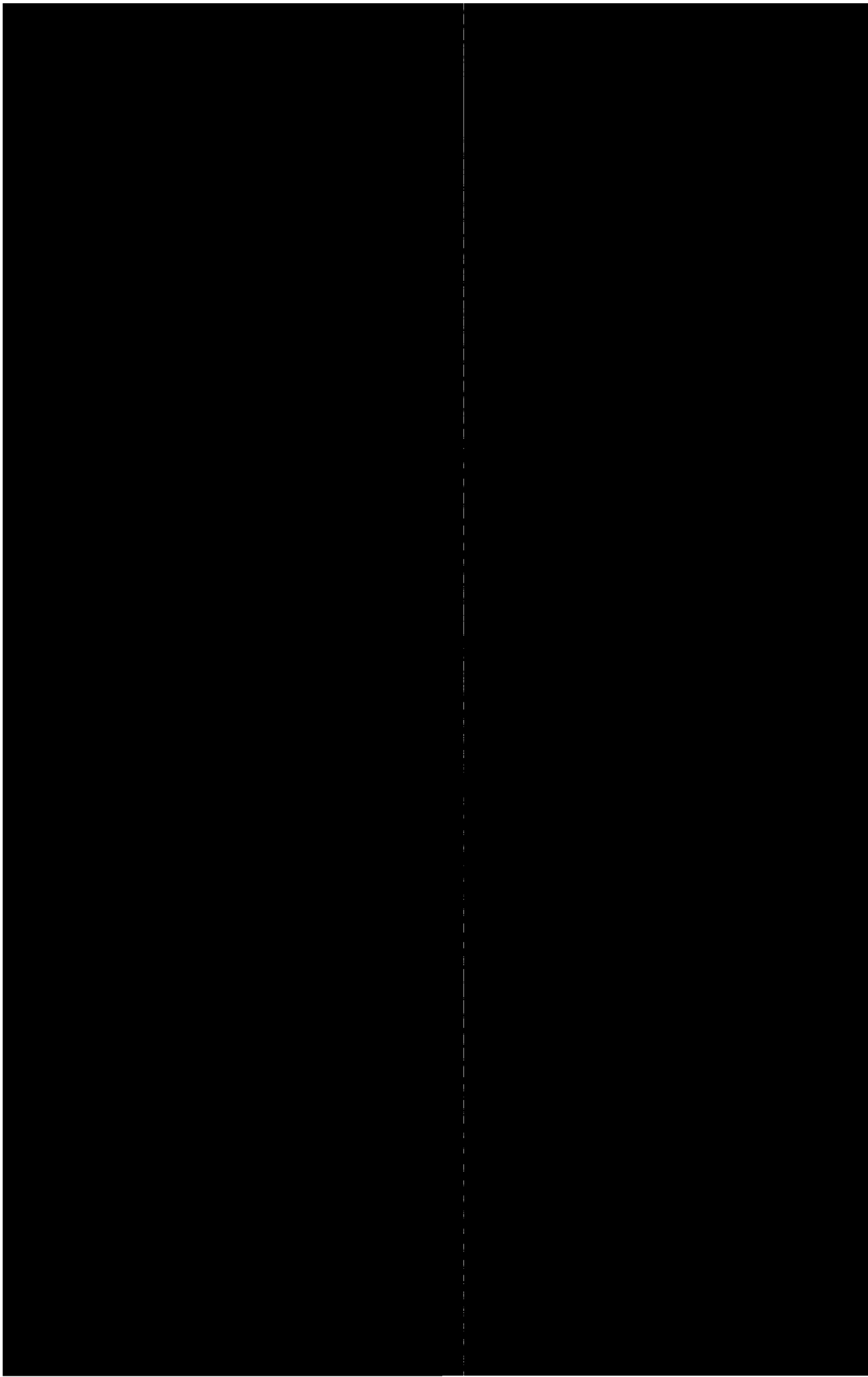
Fig. 5 is a detailed sectional view of a fan and is taken substantially on line 5—5 of Fig. 4, looking in the direction of the arrows; and

Fig. 6 is a fragmentary longitudinal sectional view through the standard and base or pedestal, on an enlarged scale from Fig. 1.

In describing the drier shown in the several views of the drawings, the corresponding parts of the drier will be designated by the same reference characters throughout the different views.

The drier includes three main parts, namely, a head or drier portion 10, a supporting standard 11, and a base or pedestal 12. The head or drier portion 10 comprises a main casting 13 forming the support for the operative parts of the head and having a reduced annular portion 13a and an enlarged substantially conical portion 13b. The portion 13a of the casting 13 is provided with a rearwardly facing (that is toward the left as viewed in Fig. 3) substantially conical recess 14 into which extend a plurality of circumferentially spaced ribs 15 having openings therein through which project adjustable supporting bolts 16 for an electric motor 17, it being noted that said motor may be accurately centered in the recess 14 by means of the bolts 16.

The motor 17 being supported at a plurality of circumferentially separated points and in spaced relation to the conical wall of the recess 14, it will be seen that a substantially annular unobstructed passageway 14a is provided between the motor and the casting 13, such passageway communicating at its left-hand end (as viewed in Fig. 3), with the enlarged portion of the conical recess 14 and at its right-hand end with the interior of



to a base 58. The tubular member 56, as will be understood, is adapted to be raised and lowered in the tubular member 57 in order to vary the vertical height of the drier and the location of the drier head. Secured to the tubular member 56 is a spring-pressed latch 59 and a vertically extending member 60, such member being station-
 5 arily mounted with respect to the tubular member 56 and having a series of openings 61 along one of its edges and adapted to receive the latch member 59, whereby, when the latch member is in
 10 engagement with any one of the openings 61, the tubular member 56 will be supported in whatever position of vertical adjustment it may be in. A member 62 extends parallel with the member
 15 60 and is provided with a plurality of snubbing projections 63 which are upon the edge of the member 62 corresponding to the edge of the member 60 in which the recesses 61 are formed, such
 20 snubbing projections engaging with a portion of the latch 59 to push said latch out of engagement with the recesses 61. The member 62 has an extension 64 at its lower end that is articulated to a lever 65 pivoted at 66 and provided with a foot
 25 engaging portion 67 extending through an opening in the base 58, whereby when the portion 67 is depressed the member 62 will be elevated and the latch 59 moved out of engagement with the particular opening 61 with which at the time it is
 30 in engagement. Surrounding the extension 64 is a spring 68 which at one end abuts against a partition wall 69 of the base 58 and at its opposite end abuts against a collar 70 secured upon the extension 64, and thus the member 62 is normally
 35 maintained in its lowermost position and the foot engaging portion 67 is held above the base 58 in position to be depressed by the foot of the operator.

In using the drier, the operator depresses the
 40 portion 67 to enable the tubular member 56 to be moved upwardly or downwardly within the tubular member 57 to adjust the drier head to the proper height, after which the portion 67 is allowed to return to its normal position and the
 45 latch 59 will engage in the adjacent opening 61 of the member 60 and hold the tubular members 56 and 57 in the relative positions to which they have been moved. The operator may then adjust the drier head angularly to properly position the
 50 same with respect to the head of the person being treated, such adjustment being effected by rotating the knob 45 in the proper desired direction.

It being assumed that the filter 50 is in position in the drier, the operator then manipulates the
 55 switches 46 and 47 to effect the heating of the elements 33 and the operation of the motor 17. The rotation of the motor 17 rotates in turn the compound fan, and the blades 31 forming the outer fan draw air into the drier head through
 60 the openings 54 in the cover plate 51, through the groove 19 and the openings 20, and into the compound fan between the sleeve-like portion 13c of the casting and the blades 31, as clearly indicated by the arrows in Fig. 3. The air then passes
 65 radially outwardly of the compound fan between the blades 31 of the outer fan and through the recess 18 in the portion 13b of the casting, from whence it passes over the heating elements 33 and into the hood member 21 exteriorly of the inner
 70 hood member 35, such movement of the air being also indicated by the arrows in Fig. 3. The air drawn into the drier head by the blades 31 of the compound fan is then forced in a whirling convolute path through the outer hood member 21
 75 and around the exterior of the inner conical hood

member 35. This whirling path of the air is gradually confined to a narrow passageway due to the increased diameter of the inner hood member 35 toward the open end of the drier head until the air passes between the cylindrical portion 36
 5 of the inner hood member and the outer hood member and into the reentrant conical flange portion 22 of the outer hood member. The reentrant conical flange portion 22 acts as a baffle and deflects substantially all of the air into the
 10 inner hood member 35. Since the fan blades 25 are oppositely disposed with respect to the blades 31, the rotation of the blades 25 acts to draw air in through the open end of the drier head and to force the same toward the rear of the head. This
 15 action of the blades 25, therefore, draws the air which has been deflected by the flange portion 22 of the outer hood member into the inner hood member rearwardly through the inner hood member, in whirling paths and through the sleeve
 20 29 and passageways 14a surrounding the motor 17, thence outwardly through the recess 14 and the openings 55 in the cover plate 51, as clearly indicated by the arrows in Fig. 3.

The effect of the air currents set up within
 25 the drier head upon the head of the person being treated is such that the hair of the patient is drawn away from the scalp and is fluffed or ruffled, thus allowing the moisture to be drawn therefrom from the scalp outwardly to the hair
 30 and to be carried through the drier head and discharged out of the openings 55. As soon as the air passing over the elements 53 is heated there will be, in addition to the drawing action of the air, a heating action upon the hair, thus
 35 speeding up the time required for the drying operation. It will be noted that since all of the incoming air must pass through the filter 50 the air will be clean and free from foreign substances and that, since the air which absorbs
 40 the moisture is discharged from the drier so as not to mingle with the incoming air, there is no likelihood of the circulated air within the drier becoming saturated with moisture and clean free air will be moving through the drier at all
 45 times during the drying operation.

Although a preferred embodiment of the invention has been illustrated and described herein, it should be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. In a drier of the character described, a head having separate passages therein one of which forms an inlet passage and another of which forms an outlet passage, means in said inlet passage for drawing air into the same, means in said outlet passage for forcing air outwardly thereof, and hood members associated with said head and communicating with said passages at their ends which are adjacent to said head and each being open at its opposite end, said hood members being formed to direct the air drawn into the drier through said inlet passage toward the open ends of the hood members and to then redirect the same toward the outlet passage of the drier.

2. In a drier of the class described, a head including a supporting member and hood members secured thereto, said supporting member being provided with separate inlet and outlet passages, means in the head for drawing air into said inlet passage and means in the head for forcing air outwardly through said outlet pas-
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sage, said hood members comprising an outer member and an inner member secured at one of their ends to said supporting member with the outer hood member in communication with said inlet passage and the inner hood member in communication with said outlet passage, said hood members both being open at their free ends with the outer hood member having a portion for deflecting the air circulated therethrough into the inner hood member, and air heating means arranged in said drier head in the path of the incoming air.

3. In a drier of the class described, a head including a supporting member and inner and outer hood members secured to said supporting member and extending outwardly therefrom with their free ends open, said supporting member being provided with a passage communicating with the interior of said outer hood member and with the atmosphere and with a separate passage communicating with the interior of said inner hood member and with the atmosphere, means in said first named passage for drawing air from the atmosphere into the same and forcing it toward the open end of said outer hood member, said outer hood member being provided at its open end with means for directing the air inwardly of said inner hood member, and means in said second named passage for drawing the air thus directed into the inner hood member rearwardly of the same and through said second named passage to the atmosphere.

4. In a drier of the class described, a head including a supporting member and inner and outer hood members secured to said supporting member and extending outwardly therefrom with their free ends open, said supporting member being provided with a passage communicating with the interior of said outer hood member and with the atmosphere and with a separate passage communicating with the interior of said inner hood member and with the atmosphere and substantially surrounded by said first named passage, means in said first named passage for drawing air from the atmosphere into the same and for forcing it toward the open end of said outer hood member, said outer hood member being provided at its open end with means for directing the air inwardly of said inner hood member, and means in said second named passage for drawing the air thus directed into the inner hood member rearwardly of the same and through said second named passage to the atmosphere.

5. In a drier of the character described, a head having means forming a passage and extending substantially from one end of the head to the other end thereof, and means forming a second passage of substantially the same length but separate from said first named passage and substantially surrounded thereby, a fan arranged in said first named passage for drawing air into the same, a fan arranged in said second named passage for forcing air outwardly thereof, said fans being concentrically mounted, and means for deflecting air passing through said first named passage into said second named passage.

6. In a drier of the character described, a head comprising a supporting member having an outer hood member and an inner hood member secured thereto and both provided with open outer ends, said supporting member being provided with a passage communicating with said outer hood

member and with the atmosphere, said supporting member also being provided with a second passage separate from but substantially embraced by said first named passage and communicating with said inner hood member and with the atmosphere, a fan for circulating air through said first named passage in one direction, a fan for circulating air through said second named passage in the opposite direction, and means at the open end of the outer hood member for directing the air from said first named passage into the inner hood member and toward said second named passage.

7. In a drier of the character described, a head comprising a supporting member having a passage therethrough forming an inlet passage and a second separate passage therethrough forming an outlet passage, a heating element arranged in said first passage, a hood member secured to said supporting member with one of its ends in communication with said inlet passage and with its opposite end open and provided with a reentrant flange, a second hood member arranged within the first named hood member and secured to said supporting member with its inner end communicating with said outlet passage and its outer end open and formed to surround in spaced relation the reentrant flange on the first named hood member, and means in said supporting member for drawing air into said inlet passage and for forcing air outwardly of said outlet passage.

8. In a drier of the character described, a head comprising a supporting member having an inlet passage and a separate outlet passage, a hood member secured to said supporting member and communicating with said inlet passage, said hood member having its outer end open and provided with a reentrant flange, a second hood member within the first hood member and secured to said supporting member and communicating with said outlet passage and having its outer end open and surrounding in spaced relation the reentrant flange of said first named hood member, oppositely disposed fans in said inlet and outlet passages respectively, means arranged in said outlet passage for operating said fans, and a heating element arranged in said inlet passage.

9. In a drier of the character described, a head comprising a supporting member having an inlet passage and a separate outlet passage, a hood member secured to said supporting member and communicating with said inlet passage, said hood member having its outer end open and provided with a reentrant flange, a second hood member arranged within the first hood member and secured to said supporting member and communicating with said outlet passage and having its outer end open and surrounding in spaced relation the reentrant flange of said first named hood member, a compound fan mounted in said supporting member and having a series of blades functioning in said inlet passage and a second series of blades functioning in the outlet passage, and a heating element arranged in said inlet passage.

10. In hair drying apparatus, a hood adapted to be placed over the user's head and comprising spaced inner and outer shells, means in the lower portion of said hood to direct streams of air against the user's head, and fan means mounted to rotate across the upper end of both spaces defined by said shells and pitched so as to move the air in said spaces in opposite directions.

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