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Keimpema et al.

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[54] **HAIR DRYING HOOD**

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[21] Appl. No.: **382,588**

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Aug. 24, 1972 Netherlands 7211529

[52] **U.S. Cl.** **34/100,** 34/99

[51] **Int. Cl.** **A45d 20/24**

[58] **Field of Search** 34/90, 91, 96–101; 132/7, 9

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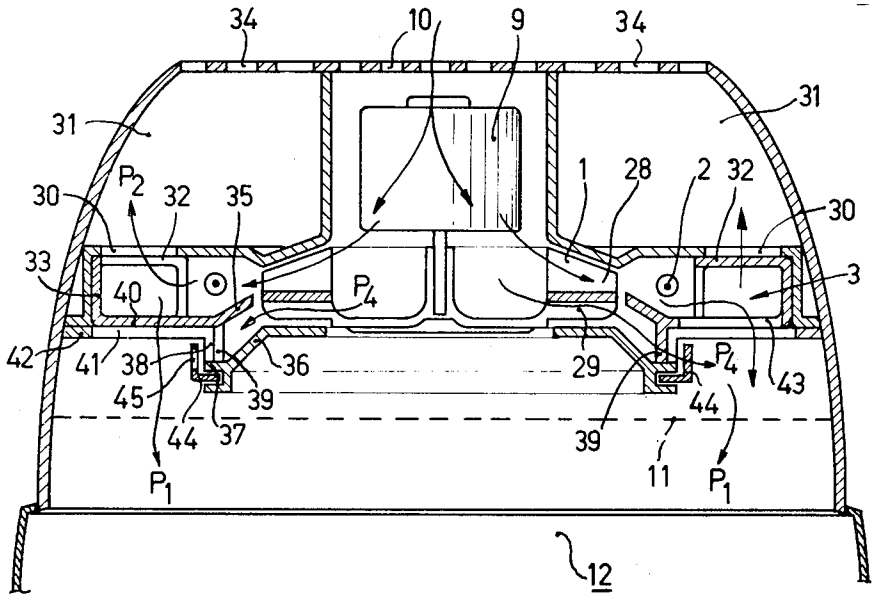
[57] **ABSTRACT**

In a hair drying hood comprising a blower driven by an electric motor and a heating element, the drying conditions inside the hood can be varied by means of a bleeding device. This bleeding device permits part of the heated air to be blown directly out of the hood or to be recirculated through the blower and past the heating element. It is also possible to use the bleeding device in combination with a stream of cold air produced by the blower.

10 Claims, 8 Drawing Figures



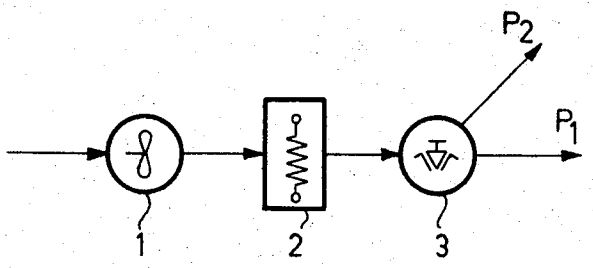


Fig.1

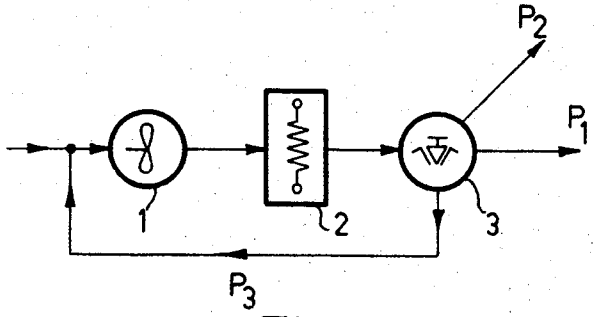


Fig.2

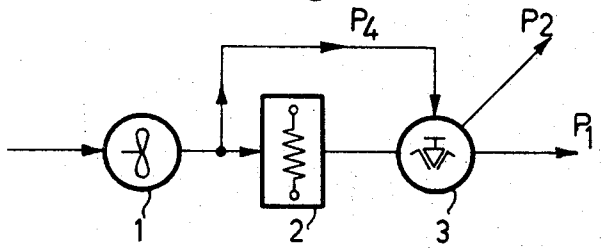


Fig.3

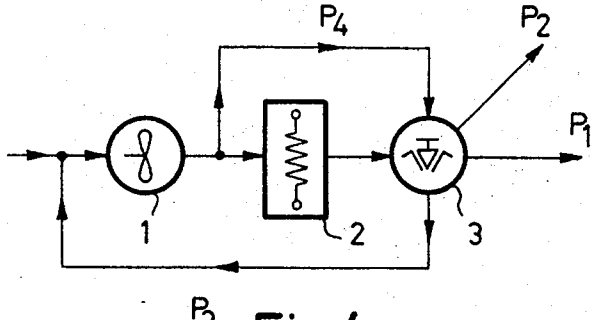


Fig.4

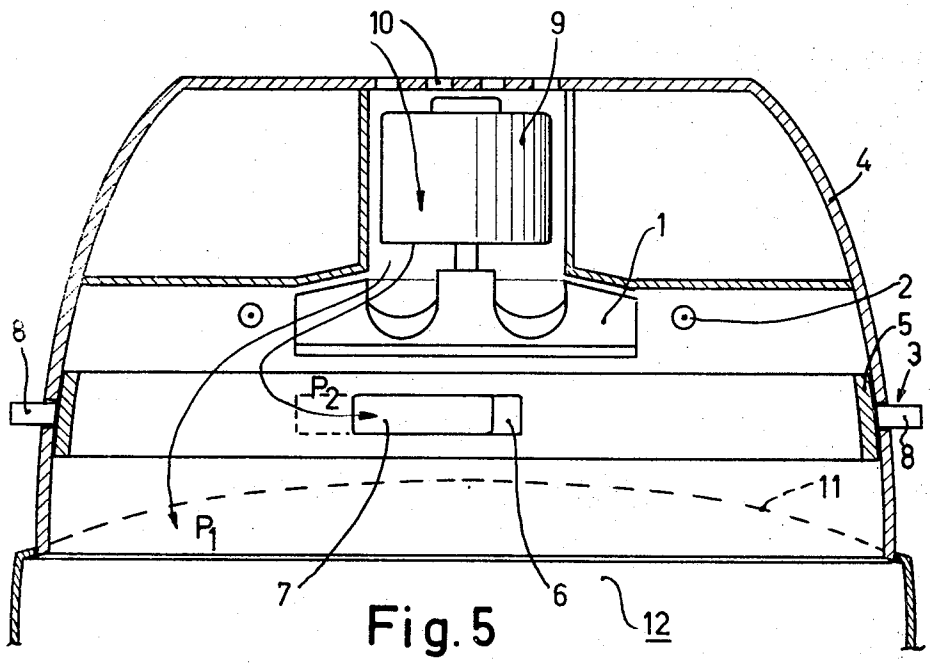

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Fig. 5

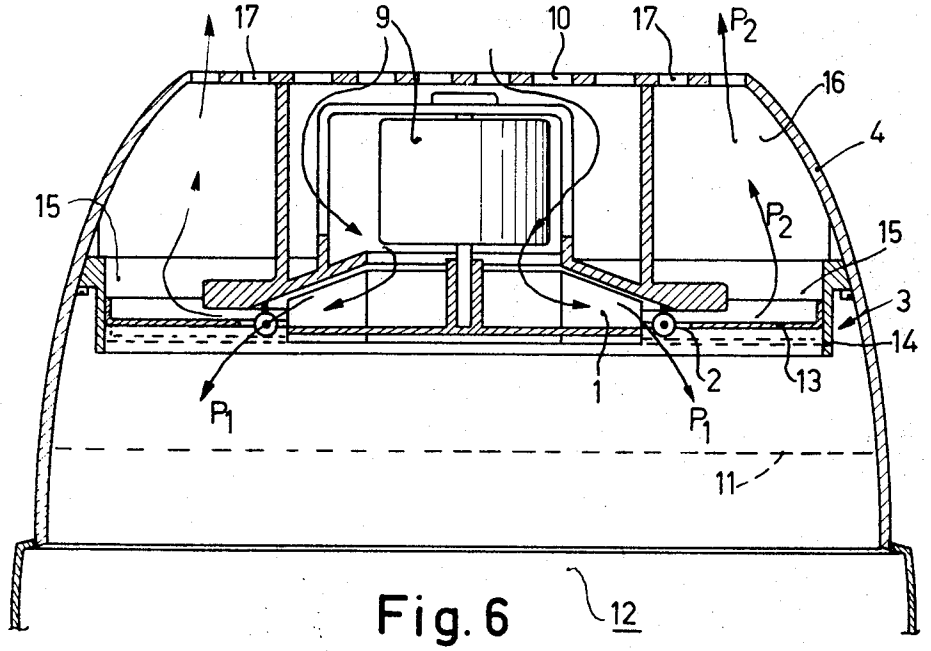
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Fig. 6

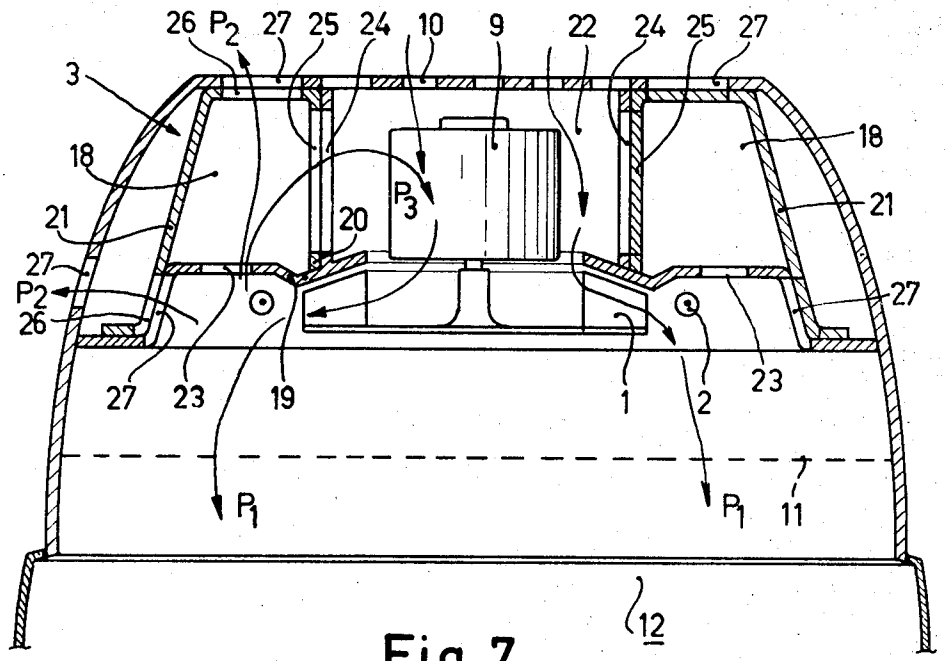
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Fig. 7

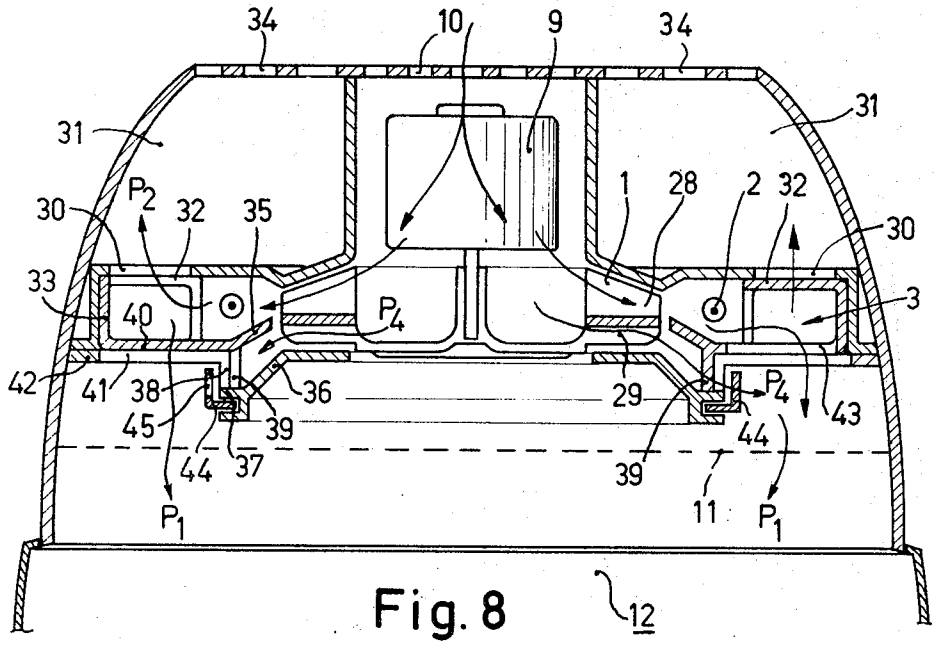
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Fig. 8

HAIR DRYING HOOD

The invention relates to a hair drying hood comprising a blower which is driven by an electric motor and a heating element. Many devices are known for varying the temperature of the air inside such hair drying hoods or for varying the amount of air circulated through these hoods. This may, for example, be effected by varying the voltage applied to the heating element or by varying the resistance of the element, whilst variation of the blower speed is also applied. A drawback of these electrical or electronic control means is that they are expensive and considerably add to the price of the hair drying hood.

It is also possible to control the heating element by means of a thermostat, but this has the drawback that the element being switched on and off periodically results in temperature fluctuations of the air which is circulated through the hood.

It is an object of the invention to obviate said drawbacks by means of a hair drying hood which is characterized in that a bleeding device for the hot air is provided, which bleeding device comprises an adjustable closing element for a separate outlet.

Bleeding off part of the heated air reduces the velocity of the residual air stream in the hood. This also reduces the degree of heat transfer between the air and the hair to be dried and also between the air and the scalp, so that the temperature appears to decrease for the user of the hood. This method permits both the air flow velocity and the temperature as it is felt by the user to be varied. The amount of air passing through the blower and along the heating element can always be constant, thus providing optimum operating conditions for the blower and the heating element.

Thus, a simple and cheap means of varying the drying conditions within the hood is obtained. Moreover, the aforementioned construction responds very rapidly, which means that almost immediately after operating the bleeding device the user will perceive a change of the air temperature inside the hood.

A preferred embodiment is characterized in that the closing element is annular and is rotatably arranged on the inside of the hood and is provided with at least one opening which corresponds to an outlet in the wall of the hood.

A further embodiment is characterized in that the closing element takes the form of an annular baffle which is movable in the axial direction of the blower and which is arranged around the heating element.

In a hair drying hood with a bleeding device as described hereinbefore, said device may readily be combined with a recirculation duct between the outlet side and the inlet side of the blower, said recirculation duct being also provided with an adjustable closing element. This closing element may be coupled to the closing element of the bleeding device or may be integral with said device as in a preferred embodiment which is characterized in that the hood is provided with a cylindrical inlet duct for the blower, the space around the inlet duct forms the recirculation duct and the adjustable closing element is formed by a cylindrical slide which is rotatably arranged around the inlet duct and which engages the wall of the inlet duct and the wall parts of the recirculation duct, whilst openings in the slide correspond to openings in said wall parts and in the wall of the inlet duct.

It is also possible to combine the bleeding device in a hair drying hood with a bypass duct for a stream of unheated air, which duct is located adjacent to a duct containing the heating element for the stream of hot air, said bypass duct also including an adjustable closing element. Again, this closing element may be coupled to the closing element of the bleeding device or may be integral with said device as in a preferred embodiment which is characterized in that the closing element is constituted by annular slide and rotatably engages wall parts of the bypass duct and the duct for the stream of hot air, whilst openings in the slide correspond to passages in said wall parts.

A further suitable embodiment is characterized in that the slide is provided with an annular baffle which surrounds the blower, the heating element being located at one side of the baffle, whilst the baffle constitutes a boundary between the duct for the hot air and the bypass duct.

Another preferred embodiment is characterized in that the bypass duct is provided with a separate closing element.

The invention will be described, by way of example, with reference to the drawings of some embodiments.

FIGS. **1** to **4** diagrammatically show the path of the air stream for some embodiments of the hair drying hood.

FIGS. **5** to **8** are sectional views of the hair drying hood according to the embodiments of FIGS. **1, 2** and **3.**

All the embodiments comprise a blower **1** for displacing the air in the hood and a heating element **2** for heating the air as basic elements. Subsequently, the air passes an adjustable closing element of a bleeding device **3.** The direction in which the air is displaced is indicated by arrows in FIGS. **1** to **8.**

In the embodiment according to FIG. **1,** the closing element guides a part of the heated air, designated by P_2, directly out of the hood. The remaining air stream which is designated by P_1 is fed to the drying space of the hood, i.e., the space which in operation accommodates the head of the user. The bleeding device may, for example, consist of one or more closable openings, which are located in the wall of the hood near the heating element. The volume of heated air P_2 which escapes is adjustable by varying the passages of the openings. This already permits a very effective control of the temperature in a drying space as it is perceived by the user. According as more heated air, designated by P_2, escapes from the hood via the bleeding device without having passed through the drying space, the volume and the velocity of the air stream P_1 through the drying space will decrease. The heat transfer coefficient which relates to the heat transfer between the hot air and the hair and also between the hot air and the scalp will decrease at a reduced velocity of the air, so that this reduced velocity will be experienced as a reduction of the temperature in the hood. Conversely, a reduction of the amount P_2 which escapes via the bleeding device will result in a rise of the temperature in the hood being experienced.

For some hair treatments, it is desirable that the temperature of the air stream in the drying space should be high for a short time. A hair drying hood with a bleeding device is very suitable for this purpose because, as described hereinbefore, said bleeding device permits

the velocity of the air to be reduced so that higher temperature becomes more bearable. Particularly a system as shown in FIG. 2 may be employed for this, in which a part of the heated air, as indicated by the arrow P_3, is circulated along the blower and the heating element via a recirculation duct, so that higher temperatures can be attained. The closing element of the bleeding device 3 also functions as an adjustable closing element for the recirculation duct. However, the recirculation duct may alternatively be provided with a separate closing element which can be operated independently of the closing element of the bleeding device.

In the system according to FIG. 3, a part of the air propelled by the blower according to arrow P_4 is guided through a bypass duct so that this part of the air is not heated by the heating element 2. This facility for separately supplying cold air can effectively assist the regulation of the temperature and the velocity of the air in the drying space by means of the bleeding device. The closing element of the bleeding device 3 may, as shown in FIG. 3, also act as an adjustable closing element for the bypass duct, or the bypass duct may be provided with a separate closing element.

Finally, the system according to FIG. 4 is a combination of the systems of FIGS. 1 to 3, in which the air stream P_2 which escapes via the bleeding device, the recirculation stream P_3 and the unheated air stream P_4 can be controlled by a single closing element or in which separate closing elements may be provided for these air streams. This system permits a wide range of possibilities as regards temperature and velocity of the air to be realized.

When the voltage on the heating element is changed, for example with a variable resistor or a thermostat, it will take ample time to restore the equilibrium as regards the heat transfer between the heating element and the passing air stream, and thus to get a new air temperature. The systems described hereinbefore enable the voltage on the heating element to remain constant. By means of the bleeding device it is possible to intervene just before the air penetrates the drying space of the hood so that very rapidly responding systems are obtained.

FIG. 5 relates to an embodiment which corresponds to the systems according to FIG. 1. Here, the ring 5 is rotatably arranged against the inner wall of the hood 4. An opening 6 in the ring corresponds to an outlet 7 in the wall of the hood, the ring being capable of rotating between a position in which the two openings 6 and 7 coincide and a position in which the ring 5 fully covers the opening 7. To this end, the ring 5 is provided with two studs 8 which extend through slits in the wall of the hood, thus suspending the ring in the hood, said studs also serving as handles by means of which the ring 5 can be rotated. The blower 1, which is driven by the electric motor 9, draws in the air through the openings 10 in the hood and feeds this air past the heating element 2. A part of the heated air is subsequently blown through the protective guard 11 into the drying space 12. Another part of the heated air, however, can escape directly via the bleeding device 3, which in this case substantially consists of the ring 5 with the opening 6 and the outlet 7 in the wall of the hood.

The embodiment of FIG. 6 also corresponds to that of FIG. 1 and differences from the embodiment of FIG. 5 only relate to the bleeding device 3. This bleeding device substantially consists of an annular disc 13 which is axially movable along a wall part 14 of the hood 4. The volume of air, designated by the arrows P_2, which escapes via the outlet port 15, the intermediate space 16 and the openings 17 in the wall of the hood is again adjustable. In the upper position the disc 13 will fully cover the outlet port 15, so that all the heated air is blown through the protective guard 11 into the drying space 12. The further the disc 13 is slid downwards, the more air escapes via bleeding device 3.

The contact between the air stream P_2 and the heating element 2 will decrease as the disc 13 further approaches the lower position, indicated by broken lines in FIG. 6, so that not only the volume but also the temperature of P_2 decrease, which adds to the effect of this control system. The disc 13 may engage in a helical groove in wall part 14, so that a rotation of the disc also results in an axial displacement of the disc.

In the hair drying hood of FIG. 7, a recirculation duct 18 is provided which is bounded by the wall parts 19 and 20 and by a rotatable annular closing element 21. The wall part 20 also bounds the central cylindrical inlet duct 22. In this manner, in accordance with the principle of FIG. 2, at least part of the air displaced by the blower 1 can return from the outlet side via this duct 18 and the openings 23 and 24 in the wall parts 19 and 20 to the inlet side of the blower. The amount which circulates is determined by the position of the rotatable closing element 21 which is provided with openings 25 which correspond to the openings 24. The closing element 21 also has openings 26 which correspond to oepnings 27 in the wall of the hood and in wall part 19, so that the closing element 21 for the recirculation system also functions as closing element for the bleeding device.

In the embodiment of FIG. 8, the blower is duplicated. The blower section 28 blows air past the heating element 2, thus causing a stream of hot air. The air stream produced by the blower section 29 does not pass a heating element and may therefore be referred to as cold air stream, in accordance with the air stream indicated by the arrows P_4 of FIG. 3. The outlet ports 30 for the hot air terminate in an annular space 31 which surrounds the motor 9. These outlet ports 30 are closed by a wall part 32 of the annular closing element 33, which is rotatably enclosed in the hood. The amount of hot air which can escape via the openings 30, the space 31 and the openings 34 in the wall of the hood again depends on the position of the closing element 33. The closing element 33 is, moreover, provided with an annular edge 35 which functions as a baffle for the streams of warm and cold air. The cold air stream is guided between this baffle 35 and a wall part 36. A wall part 37 engaging said wall part 36 is provided with passages 38 for the cold air stream. A flanged edge 39 on the closing element 33 functions as closing element for these passages 38. Moreover, the closing element 33 is provided with an annular wall part 40 with openings 43, which part 40 functions as closing element for the hot air passages 41 in the wall part 42. This method permits a very effective control of the air temperature and the air volume circulating through the hood. In an extreme position of the closing element 33, for example, the outlet ports 30 for bleeding off hot air are fully opened, the openings 41 are fully closed and the openings 38 are fully opened. Only the cold air stream now flows through the drying space of the hood. In the other extreme position, the openings

30 and 38 are closed and only warm air flows into the drying space via the openings 41. In the intermediate positions, the cold and warm air streams are mixed, the amounts being determined by the passage of the openings 38 and 41 which are only partly closed.

An additional possibility of obtaining a higher temperature is, for example, to provide a separate shutter for the cold air stream. This shutter may be constituted by a rotatable ring 44 which is arranged around wall part 37 and which is provided with openings 45 which correspond to the passages 38. This shutter 42 permits, for example, to obtain a brief period of high air temperature and a low velocity towards the end of the drying process by closing the passages 38 for the cold air stream P_4.

Finally, the construction according to FIG. 8 may be combined with a recirculation facility according to FIG. 7, so that an embodiment is obtained which operates in accordance with the system of FIG. 4.

What is claimed is:

1. A hair drying hood comprising a blower driven by an electric motor, a heating element mounted within the hood for heating air currents moved by said blower to a drying space, bleeding means for diverting heated air to an outlet opening, adjustable closing means for controlling the quantity of air passing through said outlet opening, a recirculation duct passing between an outlet side and an inlet side of said blower, and adjustable closing means for said recirculation duct, said adjustable closing means of the bleeding device being the adjustable closing means of the recirculation duct.

2. The hair drying hood as claimed in claim 1, wherein the hood is provided with a cylindrical inlet duct for the blower and the space around the inlet duct forms the recirculation duct, said adjustable closing element being a cylindrical slide rotatably arranged around the inlet duct engaging the wall of the inlet duct and the wall parts of the recirculation duct, and openings arranged in the slide for registration with openings in said wall parts and in the wall of the inlet duct.

3. A hair drying hood comprising a blower driven by an electric motor, a heating element mounted within a heating duct in the hood for heating air currents moved by said blower to a drying space, bleeding means for diverting heated air to an outlet opening, adjustable closing means for controlling the quantity of air passing through said outlet opening, a bypass duct for directing unheated air currents from said blower to said drying space, said bypass duct located adjacent said heating duct, and adjustable closing means for said bypass duct, said adjustable closing means of the bleeding device is also the adjustable closing element of the bypass duct.

4. The hair drying hood as claimed in claim 3, wherein said closing element is an annular slide arranged for rotatable engagement with wall parts of the bypass duct and the heating duct, and openings in the slide arranged for registration with passages in said wall parts.

5. The hair drying hood as claimed in claim 4, wherein said slide is provided with an annular baffle which surrounds the blower, the heating element being located at one side of the baffle, said baffle forming a boundary between the heating duct and the bypass duct.

6. The hair drying hood as claimed in claim 3, wherein said bypass duct is provided with a separate closing means.

7. A hair drying hood comprising a housing, a blower driven by an electric motor within said housing for moving air to a drying space, a heating element mounted within said housing for heating air moved by said blower, bleeding means for diverting heated air remote from said drying space comprising at least one outlet opening in the wall of said housing, and adjustable closing means for controlling the quantity of heated air diverted through said outlet opening, said adjustable closing means comprising an annular element rotatably supported on an inside wall of said housing and at least one opening in said annular element arranged for adjustable registration with said outlet opening.

8. A hair drying hood comprising a housing, a blower driven by an electric motor within said housing for moving air to a drying space, a heating element mounted within said housing for heating air moved by said blower, bleeding means for diverting heated air remote from said drying space comprising an outlet opening in the wall of said housing, and adjustable closing means for controlling the quantity of heated air diverted through said outlet opening, said adjustable closing means comprising an annular baffle mounted within said housing for axial movement and located around said heating element, so that upon axial displacement of said element the amount of heated air permitted to pass through said outlet opening will vary.

9. A hair drying hood comprising a housing, a blower driven by an electric motor within said housing for moving air to a drying space, a heating element mounted within said housing for heating air moved by said blower, bleeding means for diverting heated air remote from said drying space comprising an outlet opening in the wall of said housing, adjustable closing means for controlling the quantity of heated air diverted through said outlet opening, a recirculation duct connected between the outlet and inlet sides of said blower, and adjustable closing means for controlling the quantity of recirculated air.

10. A hair drying hood comprising a housing, a blower driven by an electric motor within said housing for moving air to a drying space, a heating element mounted within said housing for heating air moved by said blower, bleeding means for diverting heated air remote from said drying space comprising an outlet opening in the wall of said housing, adjustable closing means for controlling the quantity of heated air diverted through said outlet opening, a bypass duct located adjacent a duct containing said heating element for conducting unheated air from said blower to said drying space, and adjustable closing means for controlling the amount of unheated bypassed air.

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