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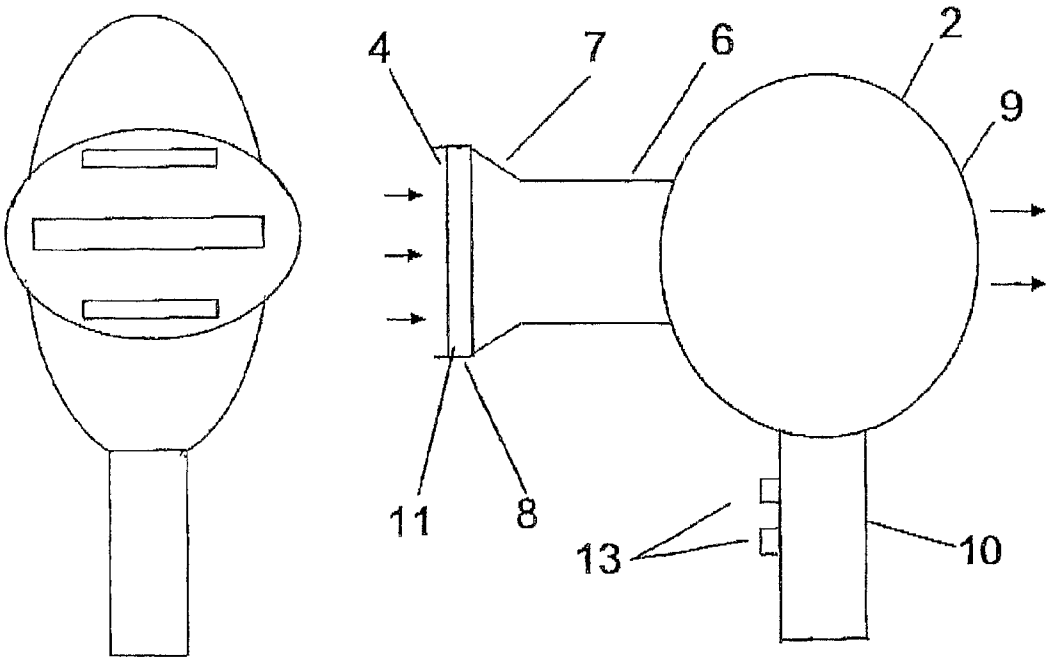

(57) **Abstract:** A hair styler comprising a housing (2) forming an air conduit (6) between an air inlet (4) and an air exhaust; an impeller within the air conduit adapted to drive from the inlet to the exhaust; a styling formation (11) at the inlet comprising a body presenting a styling surface outwardly of the inlet with at least one aperture (15) therein to serve as an inlet (4); the styling body incorporating a heating unit to raise the temperature of the styling body above ambient in use.

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HAIR STYLER

The present invention relates to a hair styling device for styling hair, in particular to a hand held hair styling device for use by a single person in the manner of, and retaining some of the features and functionality of, a hand held hair dryer.

Presently, hair dryers and styling tools can be divided into two main categories.

There are styling tools which just apply heat and pressure, for example styling tongs and hair straighteners, to style the hair. These rely on pressing the hair between two surfaces and making it hot. This then causes the hair to take the shape of whatever it is being forced against. This may be a flat surface for hair straighteners, or curved for example in curling tongs.

Hair drying devices use a combination of air blown onto the hair and heating elements to make the air hot. All such devices basically include a fan, a heating element and a housing. The fan draws ambient temperature air into the housing, moves it across an activated heating element within the housing and discharges the heated air through a discharge nozzle to dry hair. Hair dryers may be of the bonnet type, but the most useful domestic version is of the hand held type, in which the housing incorporates a gripping portion, and for example a pistol grip, allowing the unit to be held and the air directed as necessary.

This is the classic hair dryer and it requires simultaneous work with a hair brush or other styling instrument in order to hold the hair in the required shape whilst hot air is applied.

The classic hair dryer is effective in drying hair, but blows the hair in all directions in doing so and has no styling ability of its own. Hence, an extra item must be used for simultaneous styling, such as a hair brush. It is not possible to effectively straighten hair with a hot air blowing system because the hair cannot easily be held flat. This necessitates the use of a heat/pressure system such as a styling tong or hair straightener. Such a system requires the user to physically place the hair between two surfaces and so the process is laborious and slow. Moreover, the necessity for two hand held implements and a further hand to manipulate the hair makes simultaneous drying and styling by an individual virtually impossible.

It is an object of the invention to provide an improved hair styling tool, and in particular a hand held hair styling tool, which mitigates some or all of the above disadvantages.

It is a particular preferred object of the invention to provide a hair styling tool that facilitates the styling of damp hair whilst simultaneously retaining at least some of the functionality of a hand held dryer.

Thus, in accordance with the invention in a first aspect there is provided a hair styler comprising a housing forming an air conduit between an air inlet and an air exhaust; an impeller within the air conduit adapted to drive air from the inlet to the exhaust; a styling formation at the inlet comprising a body presenting a styling surface outwardly of the inlet with at least one aperture therein to serve as an air inlet; the styling body incorporating a heating unit to raise the temperature of the styling body above ambient in use.

In use, the styling body is directed at the hair so that the styling surface is placed into contact with the hair to be styled. Typically, it is envisaged that

hair will be damp at this stage, having been for example towel dried after washing or otherwise, but not fully dried. The heating unit is activated to cause the styling body to heat up to a suitable styling temperature. Actuation of the impeller additionally draws air through the aperture. The combination of the applied temperature, and the drawing of air through the hair to be styled and through the aperture to draw the hair against the styling surface together produce the desired styling effect.

It will be appreciated from the above description that the device in accordance with this aspect of the invention retains some of the features of a classical hand held hair dryer. As in such a dryer, a housing defines an air conduit, and an air impeller causes air to move along the conduit. However, the styling body, which is placed in contact with the hair in use, is at the inlet of the conduit. Air is drawn into the inlet. In effect therefore, to the extent that the device is analogous to a conventional blow dryer, it sucks rather than blows.

It will further be appreciated that the air is therefore not being preheated before it is drawn through the hair in the vicinity of the styling body. The device does not, as a matter of purpose, have a primary drying function. Nevertheless, it can be expected that this, in conjunction with the heating of the styling body, can have some drying function without departing from the scope of the invention, in addition to enhancing the styling function.

Thus, the device in accordance with the invention, relying not just on temperature and pressure at the styling body but also on the suction effect, produces an enhanced styling function which can be more rapid and flexible than the use of conventional heat/pressure systems, whilst at least potentially retaining some of the benefits of a dryer system.

The device in accordance with the invention offers this functionality in a single device adapted for a single user function. In particular, the device is adapted to be hand held by a single user. For example, the housing further includes suitable gripping means composed as part of the body of the housing. To facilitate its holding and manipulation in use, most conveniently, in like manner to conventional hand held hair dryers, the housing comprises an elongate and for example generally cylindrical portion defining the conduit with a suitable impeller disposed therein, and for example at an end thereof distally of the inlet, and the gripping means comprises a lateral extension forming a handle, for example adapted for a pistol-style hand grip.

The styling formation sits at the inlet of the conduit, and presents a styling surface on which hair can be styled. The styling surface may for example be a substantially planar styling face. In one embodiment, the styling formation is a substantially flat plate presenting such a substantially planar styling face on its surface outward of the inlet.

In one embodiment, the conduit defines an inlet aperture, for example a generally circular aperture, and the styling formation, for example being the form of a styling plate, extends across the whole extent of the conduit inlet aperture, there being provided at least one, and preferably a plurality of, through apertures within the styling formation, serving thereby as air inlets allowing air to be drawn through the styling formation and through the conduit by the air impeller in use in the manner above described.

These apertures in the styling formation may be provided with closure units adapted to permit air to be drawn therethrough unhindered, but inhibit the drawing through of hair. For example, gauze, mesh, net or other reticulated sheet formations may extend across the apertures for this purpose.

In a preferred embodiment, the styling formation comprises a styling plate or otherwise presents a substantially planar styling surface to the hair to be styled. Hair is manipulated against the styling surface to achieve the desired styling effect in use. In particular, such a planar surface is especially suited to hair straightening.

Additionally or alternatively, the styling surface may be provided with optional additional formations to produce additional styling effects, for example projections out of the plane of the plate. Removable attachments may be provided for this purpose. Additionally or alternatively, a device in accordance with the invention may be provided with a plurality of removably interchangeable styling formations to produce different styling effects.

The device of the invention is provided with a heating unit to raise the temperature of the styling formation above ambient. Conveniently, the heating unit comprises a heating element conformed as part of the styling formation, and for example conformed within or on a surface of the solid body comprising the styling formation.

In a convenient embodiment, the solid body comprises a ceramic substance with a resistance heated metal element disposed within or on a surface thereof to effect heating of the same in use.

Preferably, the device further includes control means to control the functioning of the device, for example including means to vary impeller power and hence air flow rate, and means to vary the heat imparted to the styling formation. In the preferred embodiment, the device in accordance with the invention is so configured as to be hand held, and the control means are incorporated into the hand holding means, for example into the pistol grip as

above described. For example, the pistol grip incorporates user operatable switches in a manner which will be familiar by analogy with hand held hair dryers.

Conveniently, the impeller is a rotary pump, and for example is a rotary electric pump of the type which will be familiar from conventional hand held hair dryers.

The unit preferably further includes a power source to drive the impeller and heating unit. In particular the power source is an electric power source. For example, the unit may include a power cord allowing it to be connected to a mains electricity supply. Additionally or alternatively the unit may include a rechargeable battery power source. In this latter alternative, the unit will be supplied with a recharging means enabling the battery power source to be connected to mains electricity for recharging, for example via a corded attachment, or composed into a recharging base, in either case in a manner which will be familiar in relation to domestic electrical appliances of various kinds.

The invention will now be described by way of example only with reference to Figures 1 and 2 of the accompanying drawings in which:

Figure 1 is a plan view of the heated styling plate of a device in accordance with the invention;

Figure 2 shows in front view and side view the apparatus of an embodiment of the invention incorporating the plate of Figure 1.

Referring to the Figures, it will be appreciated that the body of the styling unit is not unlike the body of a conventional hand held hair dryer. A rotary electric pump (not shown) is stored in a pump housing (2) located distally of the air

inlet (4). A cylindrical conduit portion (6) provides a fluid communication between the inlet (4) and the pump housing (2) allowing air to be drawn in use through the inlet by the fan and eventually out of the exhaust apertures (9) in the housing (2). Air flow is the direction of the labelled arrows.

A flared portion (7) of the conduit (6) expands to the desired size of aperture optimised for incorporation of the styling plate (11). The power of the pump, and the size of the conduit portion (6) flared portion (7) and aperture (8) incorporating the styling plate (11) are selected to be optimised for the desired function, and in particular optimised to get the desired degree of suction to enhance the styling effect by drawing hair against the styling plate in use. In this regard, considerations will differ from those for a hair dryer, where the device would be designed to blow rather than suck air through the aperture (8), and the design considerations for the aperture would differ accordingly (for example, in that it would often constitute an area of reduced extent to increase the air flow from the dryer).

A downward extension of the housing (10) provides a pistol-grip style handle to allow a user to manipulate the styling tool. The housing (10) may also incorporate a battery power source, or include a power cord or an electrical inlet for a power cord, to power the system in use. Switches (13) are provided on the grip to allow a user to control operation.

The heated styling plate (11) is shown in greater detail in Figure 1. The plate comprises a ceramic body (16) which is provided with air apertures (15) through which air can be drawn. A heated surface (14) serves as the styling surface on which hair is styled when drawn on to the surface by the action of the suction effect as air is drawn through the apertures (15). The heated

surfaces in practice provided by incorporating a resistance heated electric element in the plate (16).

The heated plate (11) is recessed slightly from the forwardmost extent of the aperture (8) to prevent it coming into direct contact with a user's skin should the device be pushed close to someone's face.

The enhanced styling effect in accordance with the invention is obtained in use in accordance with the following principles.

The heated surface (14) is used to provide an area against which hair can be drawn in order to use the styling effect of the heat. The hair is drawn towards the heated surface by the suction fan, in effect in a manner analogous to an ordinary hair dryer running in reverse (but without the internal heating element).

The design of the heated plate is optimised to allow the maximum air flow through the suction fan whilst provided enough heated surface area to allow the styling of the hair which is pulled against the plates by the action of the fan.

A single heated plate is shown presenting a flat surface. However, heated plates of alternative designs are perfectly possible within the scope of the invention, and heated plates may be flat or curved to allow different styling effects. Heated plates may be interchangeable.

In order to provide sufficient heat to be provided such that the hair is styled, but that no damage is caused by excessive heat, then the temperature of the plate is thermostatically controlled. It will be appreciated that cooling of the plate is continuously taking place due to evaporation of water from the hair,

exacerbated by air being drawn over the plate. Such control can be provided, for example, by a thermistor, in contact with a surface of the plate which is operably attached to the power supply heat to the plate or heating element in the plate. If desired then the operator can be provided with a control to set the temperature of the plate to suit, for example, the styling being imparted to the hair.

The plates have alternate air apertures and heated surfaces in order to hold the hair against them at several points and thus inhibit its being sucked into the fan tube. The apertures or the tube itself may also be provided with a fine mesh grill between the styling plate area and the fan itself to prevent hair being sucked down the tube and become entangled in the fan mechanism.

In accordance with the principles of the invention, an enhanced styling effect is obtained in that the suction draws hair against the plate to provide the pressure necessary to combine with the temperature offered by the heated plate to give the required styling effect. The device of the invention offers this functionality conformed in a housing which offers the simplicity of use of, and indeed borrows a number of designed features from, a conventional hand held hair dryer.

It is important to emphasise that the device of the invention is primarily a styling tool. It confers improved functionality over conventional styling tools by making use of suction to draw the hair onto the styling plate. Structural similarities with hand held hair dryers arise because there is a desire to use a fan in a compact and easily manipulatable device. The invention is not intended to be a hair dryer as such, although when used with damp hair the actions of suction and heating are likely to have some drying effect.

In accordance with the invention a convenient, efficient and easy to use solution to the problem of styling hair is offered which can readily be made compact, portable and suitable for hand held use by a single user.

CLAIMS

1. A hair styler comprising a housing (2) forming an air conduit (6) between an air inlet (4) and an air exhaust; an impeller adapted to drive air from the inlet to the exhaust; a styling formation (11) at the inlet comprising a body presenting a styling surface outwardly of the inlet with at least one aperture (15) therein to serve as an air inlet (4); the styling body incorporating a heating unit to raise the temperature of the styling body above ambient in use.

2. A styler according to Claim 1, wherein the housing further includes suitable gripping means composed as part of the body of the housing.

3. A styler according to Claim 1 or Claim 2, wherein the housing comprises an elongate portion defining the conduit (6) with the impeller disposed therein.

4. A styler according to Claim 3, wherein the impeller is located distally of the inlet.

5. A styler according to Claims 2-4, wherein a gripping means comprises a lateral extension of the housing forming a handle, for example adapted for a pistol-style hand grip (10).

6. A styler according to any preceding claim, wherein the styling formation sits at the inlet of the conduit, and presents a styling surface on which hair can be styled.

7. A styler according to Claim 6, wherein the styling surface comprises a styling surface may for example be a substantially planar styling face on its surface outward of the inlet.

8. A styler according to any preceding claim, wherein the conduit defines an inlet aperture.

9. A styler according to Claim 8, wherein the styling formation extends across the whole extent of the conduit inlet aperture, the styling formation including at least one through apertures.

10. A styler according to Claim 9 having a plurality of through apertures within the styling formation.

11. A styler according to Claim 9 or Claim 10 wherein the apertures in the styling formation are provided with closure units adapted to permit air to be drawn there through unhindered, but inhibit the drawing through of hair.

12. A styler according to Claims 8-11, wherein the styling surface comprises one or more additional formations such as projections out of the plane of the plate.

13. A styler according to Claim 12, wherein the or each formation is removable.

14. A styler according to any preceding claim, wherein the heating unit comprises a heating element conformed as part of the styling formation.

15. A styler according to Claim 14, wherein the heating element is conformed within or on a surface of the solid body comprising the styling formation.

16. A styler according to any preceding claim wherein the styling formation comprises a ceramic substance with a resistance heated metal element disposed within or on a surface thereof to effect heating of the same in use.

17. A styler according to any preceding claim, comprising control means to control the functioning of the device, such as means to vary impeller and means to vary the heat imparted to the styling formation.

18. A styler according to any preceding claim, wherein the impeller is a rotary pump.

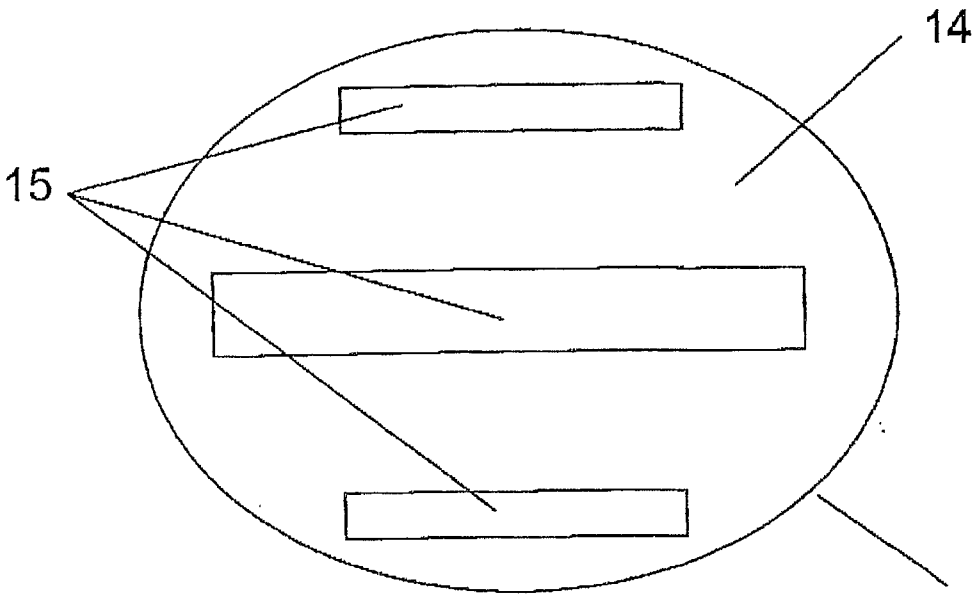

Figure 1

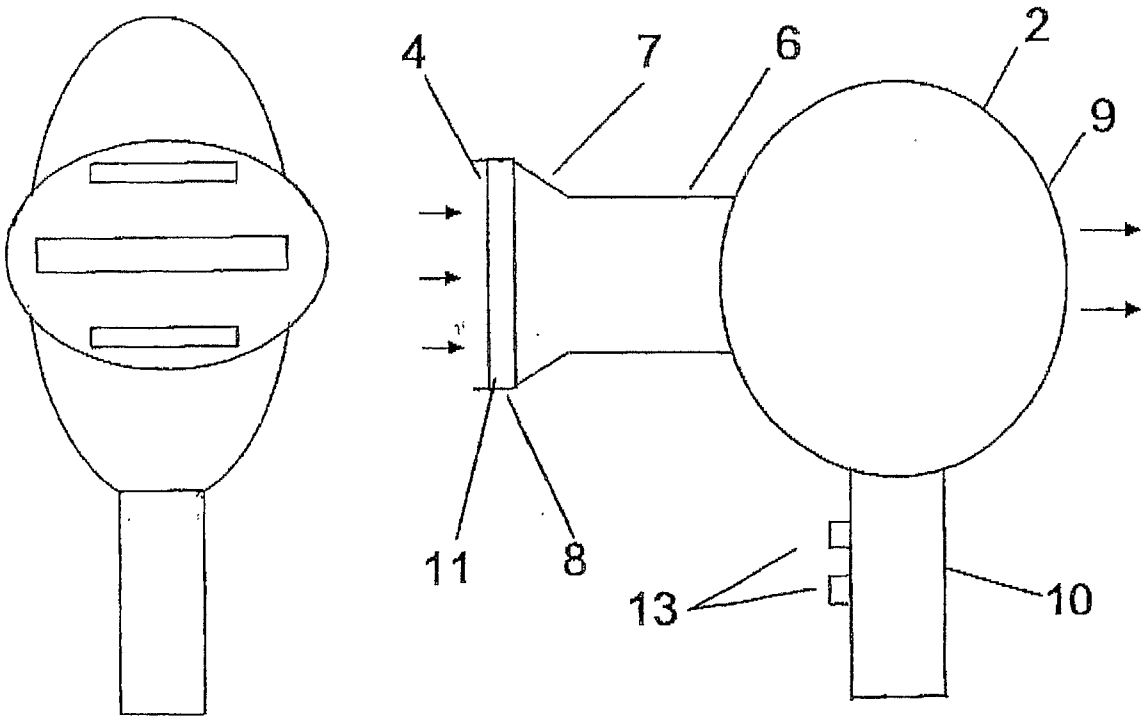

Figure 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2007/003966

A. CLASSIFICATION OF SUBJECT MATTER
INV. A45D20/00 A45D2/36 A45D2/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A45D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 232 588 A (FURSDON JAMES MACDONALD) 19 December 1990 (1990-12-19) page 2, lines 8-17 page 3, lines 1-10 page 5, lines 3-6,12,13,23-26; figure 1	1-11,14, 15,17,18
Y		16
X	US 4 210 162 A (DREYER BERNARD F [CA] ET AL) 1 July 1980 (1980-07-01) column 1, lines 15-40; figures 1-4	1-6,8, 12,17,18
Y		16
Y	GB 2 405 584 A (ADVANCED CERAMICS LTD [GB]) 9 March 2005 (2005-03-09) abstract	16

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
7 February 2008	21/02/2008
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Lang, Denis

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2007/003966

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003/037793 A1 (HWANG IN YOUNG [KR]) 27 February 2003 (2003-02-27) figure 1	5
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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