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(54) **HAIR DRYER**

(57) Hair dryer for generating an air flow (AF), the hair dryer comprising a curved shape unit (CS) defining an outer surface of the hair dryer, a first part (OS 1) of the outer surface being at an angle to a desired direction of the air flow (AF), and a second part of the outer surface being aligned with the desired direction of the air flow; a fan unit (F) at the first part (OS1) of the outer surface, the fan unit (F) having an air inlet, and an air outlet arranged for blowing air along the first part (OS1) of the outer surface; and a heater arranged for heating a user's hair.

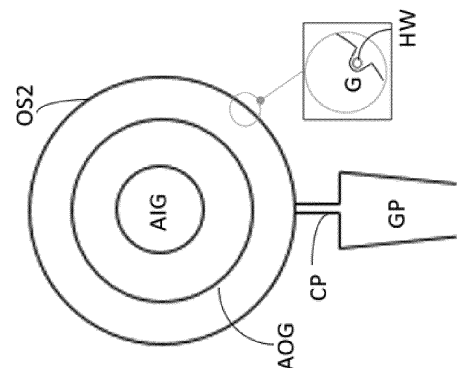


Fig. 1B

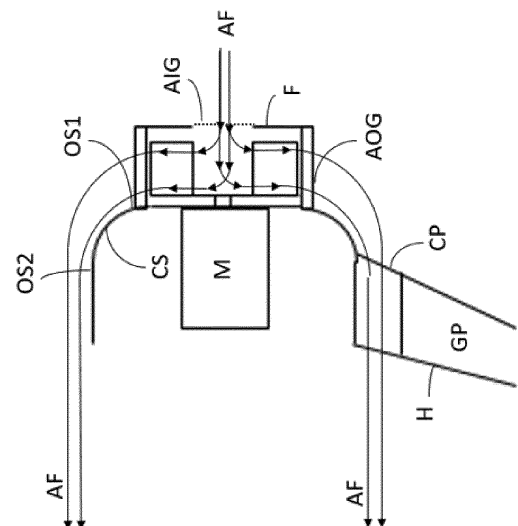


Fig. 1A

Description**FIELD OF THE INVENTION**

[0001] The invention relates to a hair dryer.

BACKGROUND OF THE INVENTION

[0002] Prior art hair dryers generally comprise a housing, an air inlet allowing air to enter the housing, a fan to move the air from the air inlet via a heater to an air outlet where heated air leaves the housing.

SUMMARY OF THE INVENTION

[0003] It is, inter alia, an object of the invention to provide an alternative design of a hair dryer, which is preferably more compact than existing hair dryers. The invention is defined by the independent claims. Advantageous embodiments are defined in the dependent claims.

[0004] The invention provides a hair dryer for generating an air flow, the hair dryer comprising a curved shape unit defining an outer surface of the hair dryer, a first part of the outer surface being at an angle to a desired direction of the air flow, and a second part of the outer surface being aligned with the desired direction of the air flow; a fan unit at the first part of the outer surface, the fan unit having an air inlet, and an air outlet arranged for blowing air along the first part of the outer surface; and a heater arranged for heating a user's hair.

[0005] The heater may be at least partially integrated in the fan unit, to heat the airflow to indirectly heat the user's hair. Additionally or alternatively, the heater may comprise a heating wire embedded in the outer surface, e.g. mounted in a groove of the outer surface, to heat the airflow to indirectly heat the user's hair. Additionally or alternatively, the heater may comprise an infrared radiation unit inside the curved shape unit arranged for producing heat radiation towards the user's hair, to directly heat the user's hair.

[0006] A motor of the fan unit may be mounted at an inner surface of the curved shape unit.

[0007] The hair dryer may comprise a handle coupled to the curved shape unit, the handle having a grip part arranged for being gripped by a user, and a connection part between the grip part and the outer surface, the connection part being thinner than the grip part.

[0008] As a result of the Coandă effect, ambient pressure makes the air flow follow the shape of the curved shape unit. The air flow will thus be guided from the first part of the outer surface to the second part of the outer surface into the desired direction towards a user's hair. The Coandă effect may also result in that ambient air not outputted by the fan unit is made to flow along with the air flow from the fan unit, thereby resulting in a total air flow that has more impact than just the air flow generated by the fan unit. The Coandă effect has been ex-

plained in https://en.wikipedia.org/wiki/Coandă_effect.

[0009] These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Figs. 1A, 1B, and 2 show first and second embodiments of a hair dryer according to the invention.

DESCRIPTION OF EMBODIMENTS

[0011] Figs. 1A, 1B show a side view and a rear view, respectively, of a first embodiment of a hair dryer according to the invention. The hair dryer comprises a curved shape unit CS defining an outer surface of the hair dryer. A first part OS1 of the outer surface is at an angle to a desired direction of the air flow AF, and a second part OS2 of the outer surface is aligned with the desired direction of the air flow AF. A fan unit F is mounted at the first part OS1 of the outer surface. The fan unit F has an air inlet with an air inlet grill AIG, and an air outlet with an air outlet grill AOG. The fan unit F blows air from the air outlet AOG along the first part OS1 of the outer surface.

[0012] A motor M of the fan unit F may be mounted at the inner surface of the curved shape unit CS, in the position shown in Fig. 1A. Alternatively, the motor M may be at the right-hand side, in the center of the fan F, e.g. in the center of the air inlet.

[0013] The hair dryer of Fig. 1 further comprises a heater for heating a user's hair. The heater may be located at the outer surface of the curved shape unit. The heater may be at least partially integrated in the fan unit F, i.e. behind the air inlet grill AIG or before the air outlet grill AOG. Additionally or alternatively, the heater comprises a heating wire HW embedded in the outer surface, e.g. mounted in a groove G of the outer surface OS1, OS2, thereby preventing a user from directly touching the heating wire HW. After mounting the heating wire, the groove G is preferably provided with a covering layer, to even better prevent the user from directly touching the heating wire HW.

[0014] Additionally or alternatively, the heater comprises an infrared radiation unit inside the curved shape unit CS. The infrared radiation unit is arranged for producing heat radiation towards the user's hair. Here, inside means at the left end in the side view of Fig. 1A, where in Fig. 1A the motor M is positioned. In that case, the inside of the curved shape unit CS is preferably reflective, so that all heat radiation is eventually radiated to the left, in parallel with the air flow AF. Any temperature increase of the curved shape unit CS as a result of the heat radiation will be counteracted by the air flow AF flowing along the outer surface OS1, OS2, resulting in a desired increase of the air flow temperature.

[0015] A handle H may be coupled to the curved shape

unit CS. The handle H has a grip part GP arranged for being gripped by a user, and a connection part CP between the grip part GP and the outer surface OS 1, OS2, the connection part CP being thinner than the grip part GP. As a result of the relatively thin connection part CP, air can easily pass the connection part CP.

[0016] Fig. 2 shows a second embodiment of a hair dryer according to the invention. In this second embodiment, the curved shape unit CS is not symmetrical, and a main unit MU comprises the fan unit, the motor of the fan unit, and the heater. The main unit MU is arranged to blow heated air along the first part OS1 of the outer surface. The main unit MU also functions as the handle. In the embodiment of Fig. 2, the motor of the fan unit is at the same side of the curved shape unit CS as the air propelling part of the fan unit.

[0017] It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. The word "comprising" does not exclude the presence of elements or steps other than those listed in a claim. The word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. In the device claim enumerating several means, several of these means may be embodied by one and the same item of hardware. Measures recited in mutually different dependent claims may advantageously be used in combination.

Claims

1. Hair dryer for generating an air flow, the hair dryer comprising:

a curved shape unit (CS) defining an outer surface of the hair dryer, a first part (OS1) of the outer surface being at an angle to a desired direction of the air flow (AF), and a second part (OS2) of the outer surface being aligned with the desired direction of the air flow (AF);
a fan unit (F) at the first part (OS1) of the outer surface, the fan unit having an air inlet, and an air outlet arranged for blowing air along the first part (OS1) of the outer surface; and
a heater arranged for heating a user's hair.

2. Hair dryer as claimed in claim 1, wherein the heater is at least partially integrated in the fan unit (F).

3. Hair dryer as claimed in any of the preceding claims, wherein the heater comprises a heating wire (HW) embedded in the outer surface (OS1, OS2).

4. Hair dryer as claimed in claim 3, wherein the heating

wire (HW) is mounted in a groove (G) of the outer surface (OS1, OS2).

5. Hair dryer as claimed in any of the preceding claims, wherein the heater comprises an infrared radiation unit inside the curved shape unit (CS), the infrared radiation unit being arranged for producing heat radiation towards the user's hair.

6. Hair dryer as claimed in any of the preceding claims, wherein a motor (M) of the fan unit (F) is mounted at an inner surface of the curved shape unit (CS).

7. Hair dryer as claimed in any of the preceding claims, wherein the hair dryer comprises a handle (H) coupled to the curved shape unit (CS), the handle (H) having a grip part (GP) arranged for being gripped by a user, and a connection part (CP) between the grip part (GP) and the outer surface (OS1, OS2), the connection part (CP) being thinner than the grip part (GP).

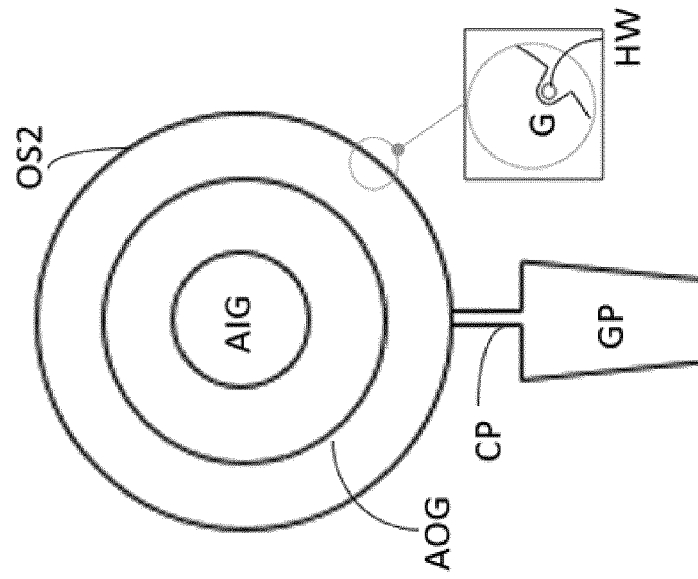


Fig. 1B

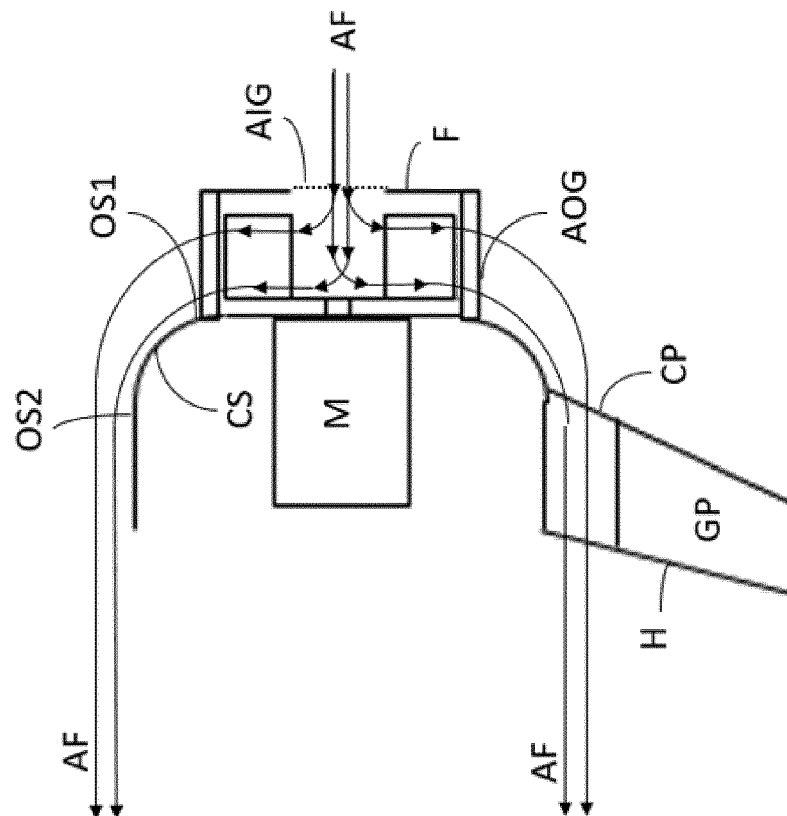


Fig. 1A

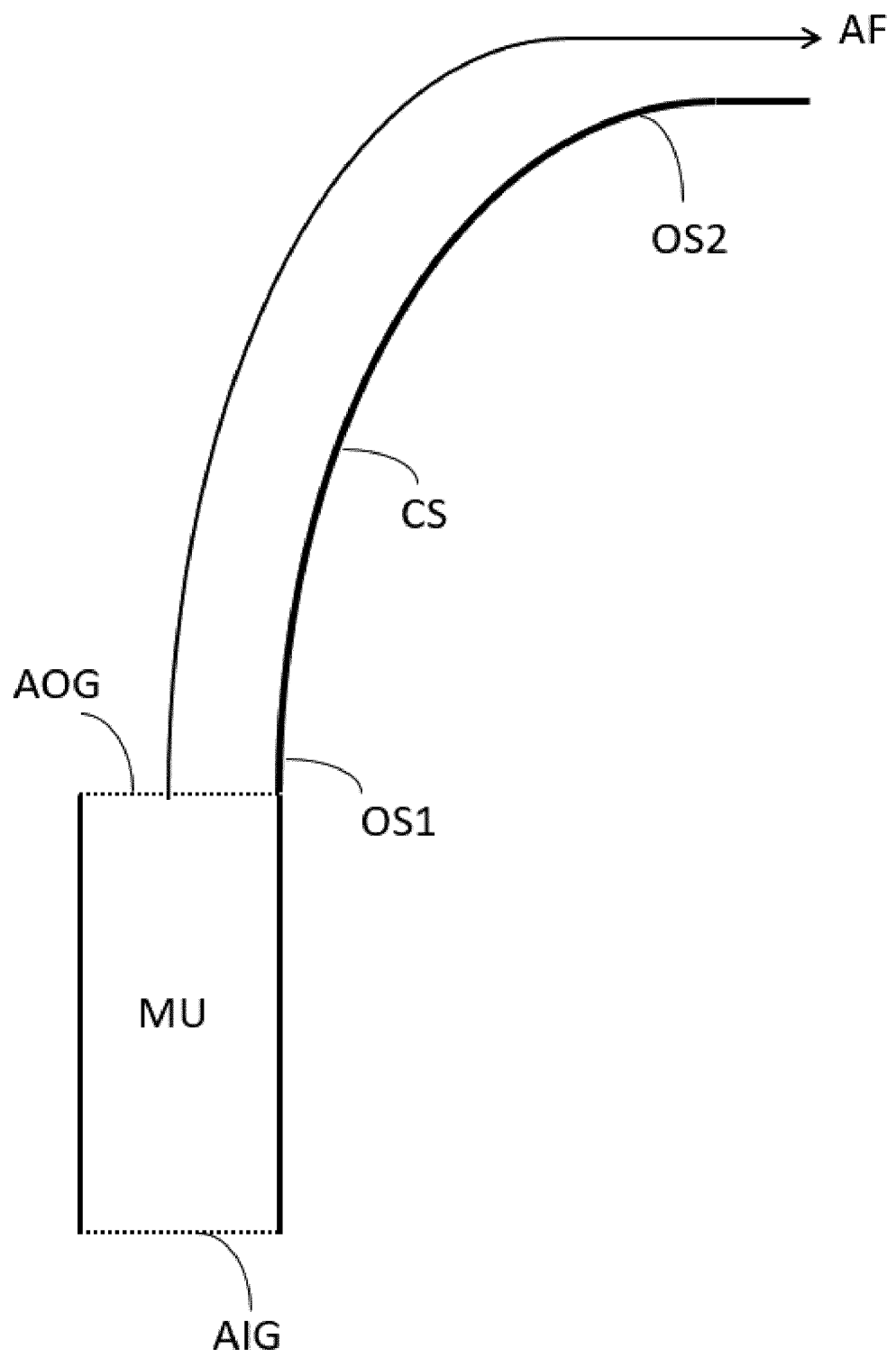


Fig. 2



EUROPEAN SEARCH REPORT

Application Number
EP 21 15 2893

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 2 503 685 A (DYSON TECHNOLOGY LTD [GB]) 8 January 2014 (2014-01-08) * abstract * * page 4, line 29 - page 8, line 14 * * figures 1b, 1c *	1	INV. A45D20/12 ADD. A45D20/10
A	GB 2 524 305 A (DYSON TECHNOLOGY LTD [GB]) 23 September 2015 (2015-09-23) * page 11, line 4 - line 9 * * figures *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A45D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 July 2021	Examiner Zetzsche, Brigitta
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 15 2893

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2503685	A	08-01-2014	NONE

GB 2524305	A	23-09-2015	NONE

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82