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- Soerensen, Olaf
61476 Kronberg (DE)
- Schmitz, Christoph
61476 Kronberg (DE)
- Pinto, Francis
61476 Kronberg (DE)
- Zebe, Catrin
61476 Kronberg (DE)
- Beutner, Sven
61476 Kronberg (DE)

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(71) Applicant: **Braun GmbH**
61476 Kronberg (DE)

(72) Inventors:
• Nicolin, Gisa
61476 Kronberg (DE)
• Seng, Juergen
61476 Kronberg (DE)

(74) Representative: **Zetterer, Gerd**
Braun GmbH
Patentabteilung
Frankfurter Strasse 145
61476 Kronberg (DE)

(54) **Personal appliance with different modes of operation**

(57) The present invention relates to personal appliances and is concerned with a beneficial method for operating such personal appliance and the required technical features. In particular, the invention concerns a personal appliance for performing a grooming task on a user, the appliance being able to perform the grooming task in at least a first mode or in a second mode, which is different to the first mode, the personal appliance comprising at least one sensor for measuring user data relevant to the grooming task, the personal appliance further comprising a user interface enabling the user to enter further user related data relevant to the grooming task and the personal appliance comprising a data processing unit, the data processing unit generating a selection signal for at least either the first or the second mode depending on the data measured by the at least one sensor and depending on the user related data entered.

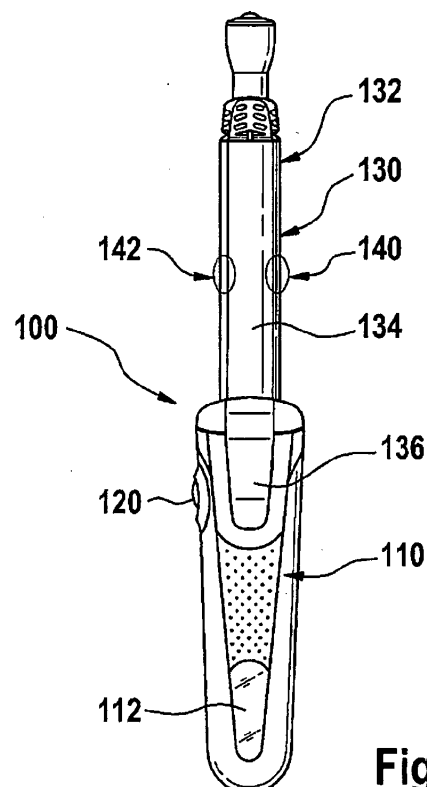


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to personal appliances and is concerned with a beneficial method for operating such personal appliance and the required technical features.

BACKGROUND OF THE INVENTION

[0002] In the different fields of personal appliances, efforts are taken to make the appliance efficient and user-friendly. Commonly different modes of operation can be selected, for performing different tasks, or for accommodating preferences of different users. For example, many hair dryers can be operated with different air throughputs and with different air temperatures.

[0003] Published German patent application DE 31 12 384 A1 (filed by Mühelos-Werk Alfred Müller) discloses a hood dryer. Conventional hood dryers are described as typically allowing for the selection of a heating temperature and a speed of the fan. Both values can often be selected continuously. However, according to this disclosure, it takes a lot of experience, even for a hair dresser, to make the right selections. Therefore, it can happen that the hair is still wet when the hood dryer is switched off according to the selection made when starting the drying process. The disclosed invention attempts to avoid this by providing a wetness sensor. This wetness sensor is supposed to end the process when the hair is sufficiently dry. Air circulating within the hood dryer is guided to the wetness sensor and the sensor is connected to an electrical circuit which can end the drying process by switching off the ventilation fan and the heater.

[0004] A dryer hood is a relatively spacious personal appliance. Hence, it is relatively easy to place one or several sensors in a dryer hood. As a dryer hood is a very specific type of a personal appliance comprising the hood as a closed space, it is relatively easy to find an appropriate place for a sensor and to make representative measurements.

[0005] US patent 4,602,143 (to Clairol Incorporated) discloses an infrared hair styling device. This device is provided in the form of a curling iron with an infrared radiation source. The curling iron comprises a hollow barrel for radiating infrared radiation. The barrel is substantially transparent to radiation. The curling iron is also provided with a circuit for energizing the infrared source in a cyclical manner in order to maintain the temperature of the barrel within a predetermined range. This device also comprises a temperature sensor to sense the temperature of the barrel in order to activate the control unit for maintaining the predetermined temperature range. Hence, within a predetermined temperature range the infrared source will cycle on and off.

[0006] Operating a curler with infrared light requires, *inter alia*, the use of a transparent barrel for the curler.

This is a somewhat costly approach, not necessarily required for all curlers. Curlers with simpler resistive heating, cannot employ the same type of sensor and setup. Further, the circuit allows only to keep one preselected temperature. Individual user needs and habits are not comprehensively addressed.

[0007] The present invention attempts to improve these concepts found in the prior art. In particular, the present invention attempts to provide a personal appliance which provides an optimal mode of usage for different users and for different usage situations.

SUMMARY OF THE INVENTION

[0008] The present invention relates to personal appliances and is concerned with a beneficial method for operating such personal appliance and the required technical features. In particular, the invention concerns a personal appliance for performing a grooming task on a user, the appliance being able to perform the grooming task in at least a first mode or in a second mode, which is different to the first mode, the personal appliance comprising at least one sensor for measuring user data relevant to the grooming task, the personal appliance further comprising a user interface enabling the user to enter further user related data relevant to the grooming task and the personal appliance comprising a data processing unit, the data processing unit generating a selection signal for at least either the first or the second mode depending on the data measured by the at least one sensor and depending on the user related data entered.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Fig. 1 shows a personal appliance in the form of a hair curler. Such a hair curler can make use of the features of the present invention.

Fig. 2 shows a hair straightener which is a personal appliance, which can implement the present invention.

Fig. 3 shows a scheme illustrating the cooperation of key components of the present invention.

Fig. 4 shows another scheme illustrating another embodiment of the present invention.

Fig. 5 shows another scheme illustrating another embodiment of the present invention.

Fig. 6 shows another scheme illustrating another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0010] A personal appliance in accordance with the present invention can take a variety of forms. The personal appliance can be a grooming appliance, for example a shaver, a trimmer, a beard trimmer, an epilator, or a hair care device, e.g. a curler, a straightener, a brushe, a hair dryer, and the like. Depending on the personal appliance the grooming task is different and hence the first mode and the second mode to perform the grooming task are different and specific to the personal appliance. For example a shaver could be operated with fast moving or slow moving cutting knives. The personal appliance can also be an epilator. In an epilator comprising and epilation roll a first mode could be one of slow motion of the epilation roll and a second mode could be one of a fast movement of the epilation roll. Where the personal appliance is a hair care appliance, the grooming task will typically be the task of drying hair or straightening hair or curling hair. In hair care grooming tasks the temperature at which the task is performed is critical. For example a first mode for such hair care grooming task could be a mode of low temperature and a second mode for a hair care grooming task could be a mode of high temperature.

[0011] In accordance with the present invention the personal appliance will comprise at least one sensor for measuring user data relevant to the grooming task. Again, these data depend on the nature of the task. For example the skin temperature or skin dryness could be measured. Likewise, the hair temperature or hair dryness or hair wetness could be measured. Typically such user data will be representative for an aspect or a feature of the user's body and the state this body or part of the body is in.

[0012] The personal appliance should further comprise a user interface enabling the use to enter user related data. Such user related data can for example be skin type, skin color and tone, skin dryness, frequency of doing the same or a different grooming task, hair color, hair length, density of body hair, or the like.

[0013] The interface will allow the user to enter such data. For example a key pad allowing to enter letters and numbers or numbers only or the like can be useful. A switch with two or more positions or a button can also be useful to enter data. Sometimes the user interface will comprise a display. A display can be helpful to enter a variety of user data with relative simple selections, for example selections by using a button. A touch display can also be a useful user interface.

[0014] Alternatively or additionally, an external device can serve for entering data. Useful devices are computers, also in the form of laptop or tablet computer, or mobile phones, smart phones, digital assistants and the like. These devices can be connected to the personal appliance via a cable or via a wireless connection, using e.g. the W-LAN or Bluetooth connection elements and protocols.

[0015] The data storage unit may alternatively or in addition also store individual data which are at least in part generated during usage by the user. Thus the appliance is then able to improve its performance (select the most appropriate mode or temperature setting of the heating plates of a straightener) in shorter time due to the training occurred by earlier usage. The appliance is then "self-learning". This aspect can be also independently claimed in the context of the other features described hereinbelow and above.

[0016] The personal appliance will further comprise a data processing unit. This processing unit is able to perform mathematical and logical operations. The unit will typically comprise integrated circuits and similar parts often used in computers. The data processing unit will generate a selection signal for either the first or the second mode. This signal can then be used to trigger the selection of the respective mode.

[0017] Often, the signal will be low volt signal and suitable electrical or electronic means will be required to transform the signal into a signal suitable to actually trigger the selection. It is useful in the context of the present invention, that the selection signal generated by the data processing unit is performed into a second selection signal. Such a second selection signal can be more suitable to trigger the desired selection, for example be of higher voltage.

[0018] Importantly, according to the present invention, the selection signal is generated in a complex operation and depends at least on the data measured by the at least one sensor and also on the user related data entered. The combination of such various data provides a higher quality of the selection signal. That means, that the signal is more likely to trigger the selection of an ideal grooming mode as compared to signals generated in a simpler way, for example by a user selection only or by a sensor selection only.

[0019] It should also be noted that further to a first mode and a second mode, a third mode, a fourth mode, and so forth can exist. For example the different mode can be different temperature settings. It can also be that the second mode comprises features of the first mode and additional features. For example, the first mode can be the operation of an electric shaver alone and the second mode can be the operation of the electric shaver and an electric trimmer.

[0020] It is often useful to have a personal appliance with continuous band of modes. For example it is possible to set a continuous or almost continuous number of temperatures within a certain range.

[0021] It has been very useful to provide a personal appliance which further comprises a data storage unit. Such a data storage unit can take a variety of commonly known forms. The data processing unit can then generate a selection signal also depending on the data stored in the data storage unit.

[0022] The nature of the data stored in the data storage unit can be quite different. For example the data can be

non-individual. Such non-individual data are to be understood as data not generated relative to a specific individual user. For example such data can be usage data generated from a large variety of users representative for an unspecified variety of users or representative for a certain subset of users (e.g. young women or the like).

[0023] It has been found useful to use two sensors. The two sensors can measure the same property, for example temperature. Two sensors can achieve a more accurate temperature measurement as compared to a single sensor.

[0024] Alternatively or additionally, temperature data received from two sensors can be processed for achieving a different quality of information rather than temperature. For example, the temperature difference between the front end and the rear end of the heating plates of a hair straightener can be representative for the dryness of the hair. If the hair is wet, it will normally absorb more heat from the heated plates of a hair straightener, and hence the temperature drop between the front sensor and the rear sensor (in a given stroke direction) is more pronounced. Therefore, a set of temperature data can be transferred into a set of dryness data. Dryness data are referred to as a data set of a different nature as compared to the temperature data set.

[0025] In the context of the present invention, a personal appliance is considered useful, wherein the data measured by the at least one sensor form a first data set comprising a data representing a first physical property and wherein a second data set comprising a data representing a second physical property is generated using data from the first data set and the second physical property is different from the first physical property. With reference to the example given above, the first set of data can be temperature data and the second set of data can be dryness data.

[0026] In one useful way of practicing the invention, this conversion can be achieved by relying on data stored in the data storage. For example, the data storage may have representative data for temperature drop depending on hair dryness. Hence, by relying on the stored data, it is possible to reliably transform temperature data into dryness or wetness data (it is understood that wetness data is the same physical property as dryness data for all embodiments). When the first set of data is created by a single sensor, the quality of the second set of data can be increased by additionally relying on data from the data storage.

[0027] It is also possible that the personal appliance comprises a third sensor which measures data of a different nature than the first and the second sensor. For example, in case of a hair straightener, the third sensor may measure hair dryness directly. The data of the third sensor can then be compared with the process data of the first two sensors. The comparison can then lead to an estimate about the reliability of the sensors and to an overall more accurate measurement.

[0028] Alternatively, the data of the third different sen-

sor can be used to create a data set of yet different quality. For example, when the dryness of the hair is known from data generated by the third sensor, the temperature data generated by the first and second sensor could be used to have an estimate for the speed with which the device is moved through the hair. The third sensor or a fourth sensor could also be a sensor measuring the position of the hair straightener.

[0029] Fig. 1 shows a representative hair care device in the form of a curler, which can implement all aspects of the present invention. The curler 100 comprises a gripping unit 110. The gripping unit comprises a display window 112. The gripping unit can further comprise a switch or interface 120. The device 100 will as a further essential component comprise the hair treatment unit 130. The hair treatment unit comprises the central heated barrel 132 and the clip 134. For opening the clip an actuator button 136 is provided. In two regions of the heated barrel 132 sensors can be provided. A first region 140 is suitable for a first sensor and a second region 142 is suitable for a second sensor. These regions can be adjacent to either side of the clip 134.

[0030] Fig. 2 shows a hair straightener, which can also embody the present invention. The hair straightener 200 comprises a gripping unit 210. the gripping unit essentially comprises a first arm 212 and a second arm 214. Both arms are linked at joint 216. A cable 218 is provided at one end of the straightener 200. As an interface the straightener comprises a dial knob 220. Further, the straightener 200 comprises a hair treatment unit 230. This hair treatment unit also comprises a first arm 232 and a second arm 234. At one end of the first arm 232 a gripping unit 236 is provided. Both arms comprise heated surfaces and for the second arm 214 the first heating surface 250 can be clearly seen. Adjacent to the first heating surface 250 an area 240 for the first sensor is provided and an area 242 for the second sensor is provided.

[0031] Fig. 3 provides a schematic illustration of the functioning of the present invention, without providing actual parts of the invention as embodied in a personal appliance. The personal appliance might generate first sensor data SD1 and second sensor data SD2. Additionally, the user can enter data by a suitable interface, such that further entered data ED are available. All these data are transmitted to a central processing unit. This unit will then generate an output signal O.

[0032] Fig. 4 shows another embodiment of the present invention. Again sensor data SD1 and sensor data SD2 are provided to a processing unit along side with entered data ED. However, in this embodiment the processing unit P also is linked to a knowledge data base KDB. From this data base, data can be provided for a better processing and analysing of the data SD1, SD2 and ED. Hence, the output signal O can be of a better quality.

[0033] Fig. 5 discloses a yet further embodiment of the present invention. In this embodiment the sensor data

SD1 and SD2 are processed differently. It can be assumed, that SD1 and SD2 are data of the same type, for example temperature data taken by two temperature sensors at two different positions of interest. These sensor data can then be processed in a sensor data processor SDP. As discussed before, the output of the sensor data processor to the central processor P can be of a different nature than the input data. For example, the output data can have the quality of dryness data, while the input data only are temperature data. Optionally, according to the present invention, time data TD can be provided. Such data can be provided by a simple commercially available time signal. It is then possible to have a time curve of the sensor data. These time data TD can be provided directly to the central processor P or can alternatively, as shown, be provided to the sensor data processor SDP. Hence, the sensor data processor SDP is enabled to provide time dependent data. For example, a time dependent temperature curve or a time dependent dryness curve can be provided. As also shown in Fig. 5 it is possible to provide data from further sensors to the sensor processors, such as data SD3. These data again can be combined with a time signal in the central processor P or in another processor, similar to the sensor data processor SDP shown. Where such data provided these data will lead to a higher quality output signal O, especially when the central processor P can also compare the measure data with reference data such as data from a knowledge data base KDB.

[0034] Fig. 6 shows yet another embodiment of the present invention. As compared to Fig. 5 a second data base is provided. Further a user data base UDB is provided. Such user data base can store data generated over the use by an individual user or a small number of users (for example within a family). Based on such a data base it is possible to detect changes in user habits. It is also possible to distinguish between different users. For example one member of the family may normally use the appliance with dry hair another member of the family will normally use the appliance with wet hair. Hence, by comparing fresh data with stored data from a small number of users, it is possible to analyse the situation or to at least make an educated guess. Based on such guess, for example a user using the device on wet hair can be offered a higher temperature than a user using the device with dry hair. If, based on such data stored in the user data base UDB, an individual user can be recognized, other settings can also be selected suitable for the individual user, for example the settings for users with colored hair can be different than for a user with hair of natural color.

[0035] (The different schematic elements referred to in Figures 3 to 6 can also referred to by reference numerals. For example, the first sensor data (SD1) can be referred to as sensor data 10, the second sensor data (SD2) can be referred to as sensor data 12, the time data (TD) can be referred to as 16, the sensor data processor (SDP) can be referred to as 18, the enter data (ED) can

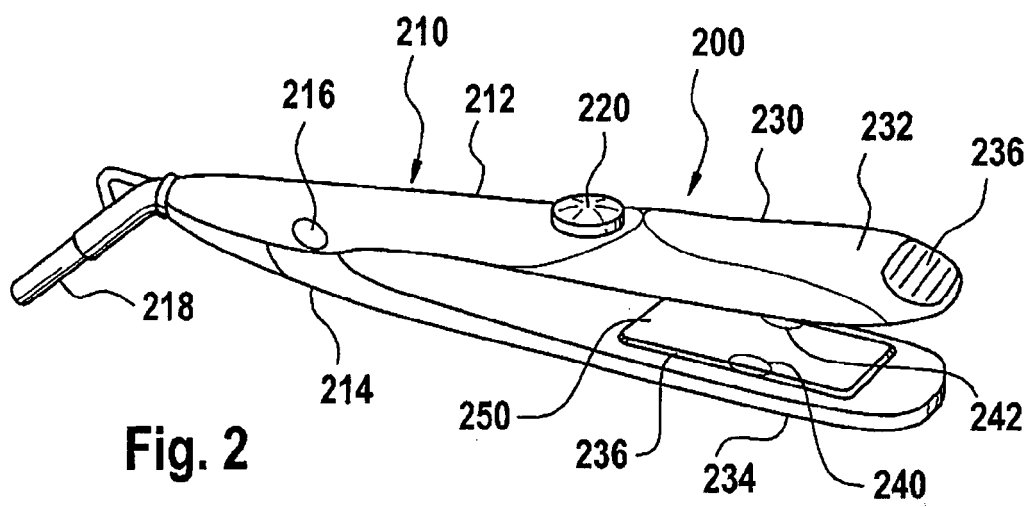
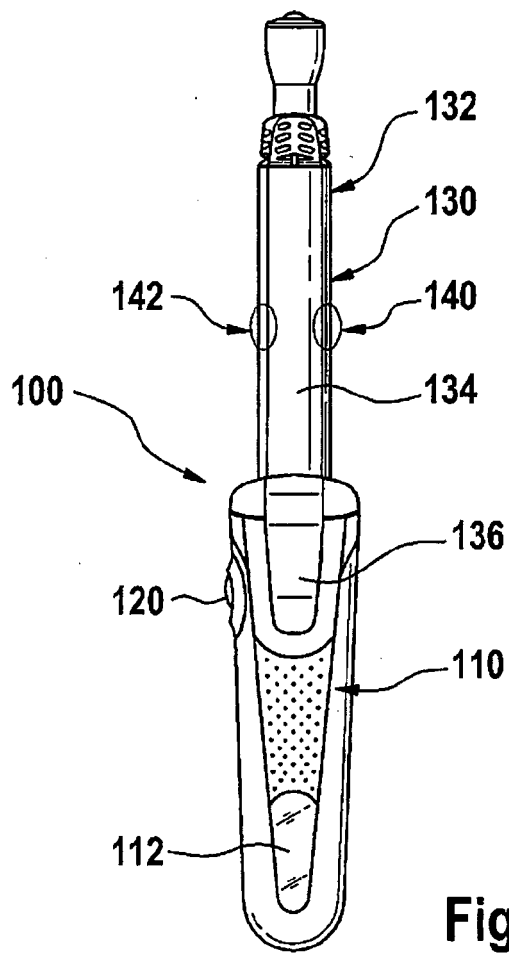
be referred to as 20, the third sensor data (SD3) can be referred to as 14, the central processor (P) can be referred to as 30, the output signal (O) can be referred to as 40, the knowledge data base (KDB) can be referred to as 50 and the user data base (UDB) can be referred to as 60.)

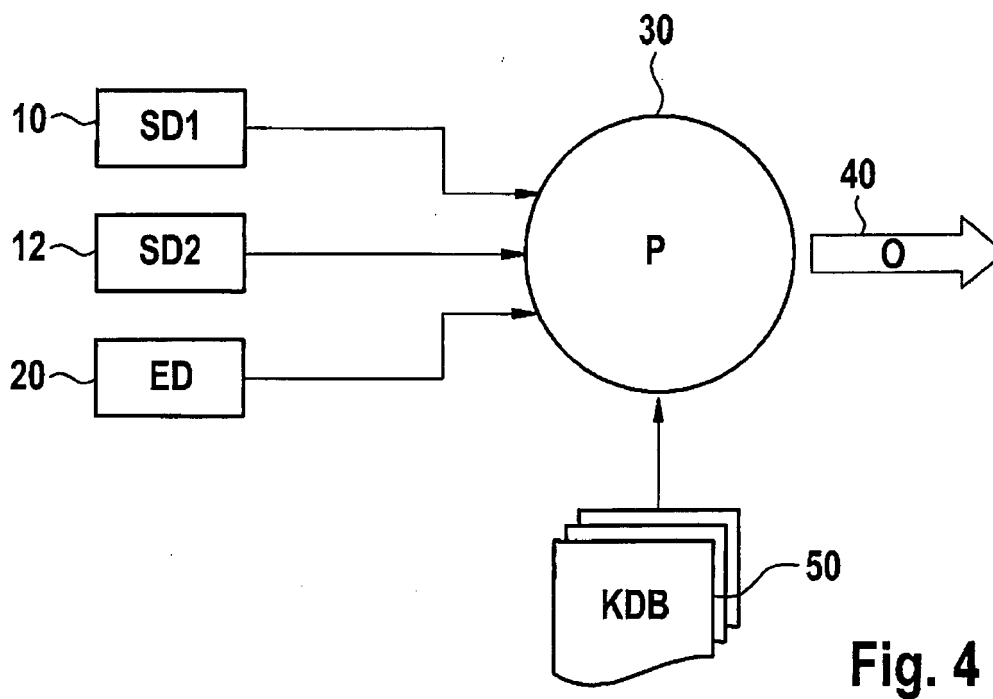
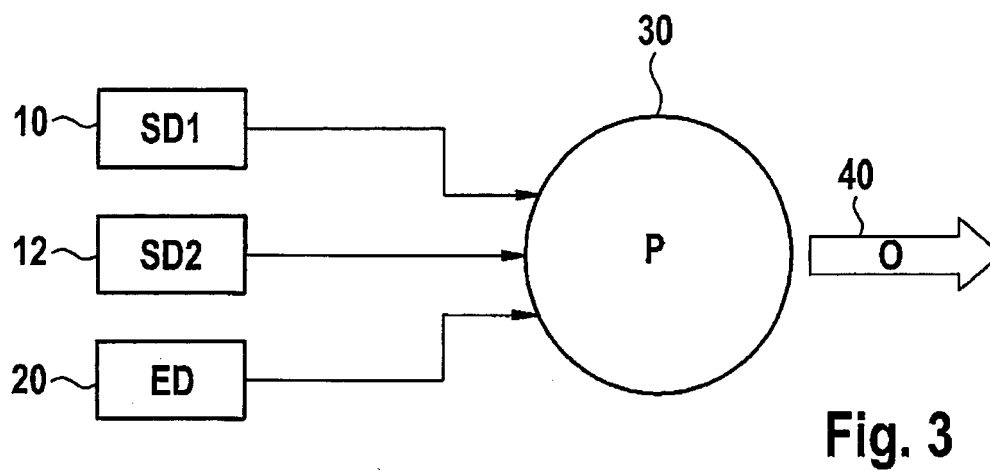
[0036] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm."

Claims

1. A hair straightener for performing a grooming task on a user, the straightener being able to perform the grooming task in at least a first mode or in a second mode, which is different to the first mode and comprising at least a first and a second sensor for measuring user data relevant to the grooming task, a user interface enabling the user to enter further user related data relevant to the grooming task and a data processing unit, **characterized in that** the data processing unit generates a selection signal for selecting at least either the first or the second mode depending on the data measured by the at least first and second sensors and depending on the user related data entered and **in that** the first and second sensors are provided to measure temperature and/or hair wetness.
2. The hair straightener of claim 1, **characterized by** a data storage unit and wherein the data processing unit generates a selection signal also depending on the data stored in the data storage unit.
3. The hair straightener of claim 2, wherein the data storage unit stores non-individual data.
4. The hair straightener of any one of claims 2 or 3, wherein the data storage unit stores individual data which are at least in part generated during usage by the user.
5. The hair straightener of any one of preceding claims, wherein the straightener is designed to perform the grooming task in a multitude of modes, the multitude comprising at least three modes and wherein the data processing unit is generating a selection signal for any one mode out of the multitude of modes.
6. The hair straightener of claim 5, wherein the multitude of modes comprises distinct modes or continuous modes.

7. The hair straightener of any one of the preceding claims, **characterized by** a heating or cooling device for performing the grooming task at a given temperature level and wherein the modes are temperature levels.
8. The hair straightener of any one of the preceding claims, wherein the data measured by the first sensor form a first data set comprising a first number of data and wherein a second data set comprising a second number of data is generated using data from the first data set and the second number is smaller than the first number.
9. The hair straightener of any one of the preceding claims, wherein the data measured by the at least one sensor form a first data set comprising a data representing a first physical property, in particular temperature, and wherein a second data set comprising a data representing a second physical property, in particular hair wetness, is generated using data from the first data set and the second physical property is different from the first physical property.
10. The hair straightener of claim 8 or 9, the second data set is generated in a process using data provided by the data storage unit.
11. The hair straightener of any one of the preceding claims, wherein the interface comprises a display and an input device.
12. The hair straightener of any one of the preceding claims, wherein the data entered via the user interface relates to at least one of hair length, hair density and/or hair color and the sensors being provided to measure a different physical property than that of the data entered via the user interface.
13. The hair straightener of any one of the preceding claims, wherein the first and second sensors are provided to measure temperature at two lateral locations of the hair straightening plate or adjacent to that which are remote to each other and arranged in a direction of the hair movement through the straightener, so that both sensors are contacted by the users hair during use of the straightener.
14. The hair straightener of any one of the preceding claims 2- 13, wherein a central processor automatically selects based on the selection signal the appropriate mode by a comparison of the data entered via the user interface and sensor measurement data with pre stored data stored in the data storage unit.
15. The hair straightener of any one of the preceding claims 2-14, wherein the data stored in the data storage unit is a knowledge data base that includes non individual usage data generated from a large variety of users representative for an unspecified variety of users or representative for a certain subset of users.
16. A personal appliance for performing a grooming task on a user, the appliance being able to perform the grooming task in at least a first mode or in a second mode, which is different to the first mode, the personal appliance comprising at least one sensor for measuring user data relevant to the grooming task, the personal appliance being **characterized in that** it further comprises a user interface enabling the user to enter further user related data relevant to the grooming task and the personal appliance comprising a data processing unit, the data processing unit generating a selection signal for at least either the first or the second mode depending on the data measured by the at least one sensor and depending on the user related data entered.
17. The personal appliance of claim 1, **characterized by** at least one of the features of claims 1-15.





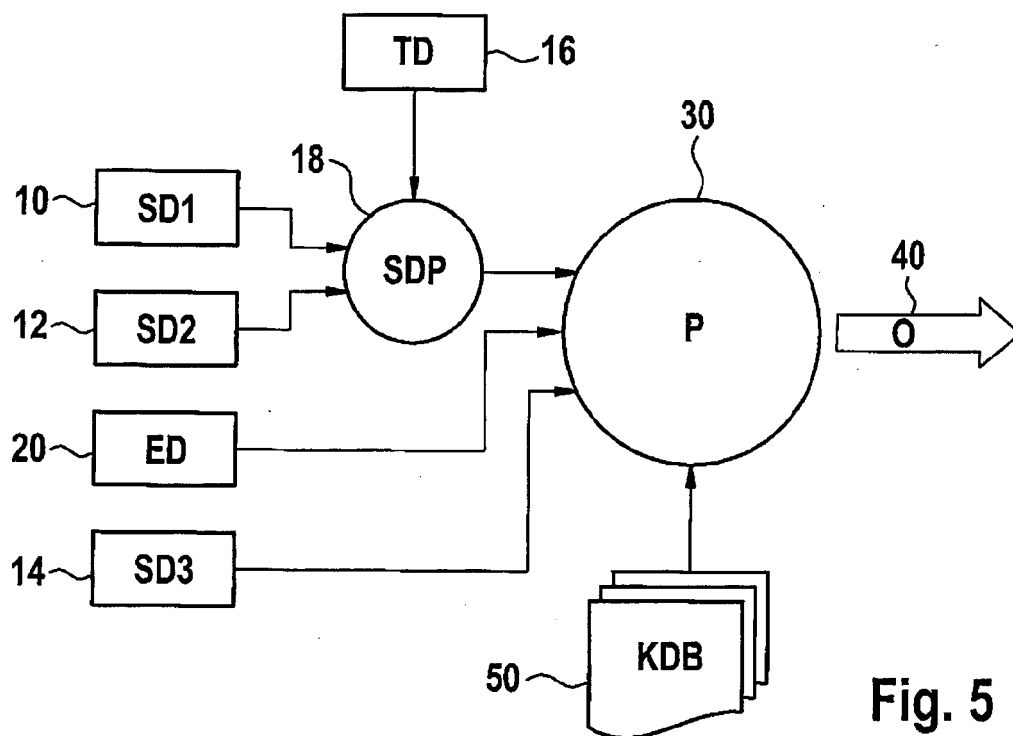


Fig. 5

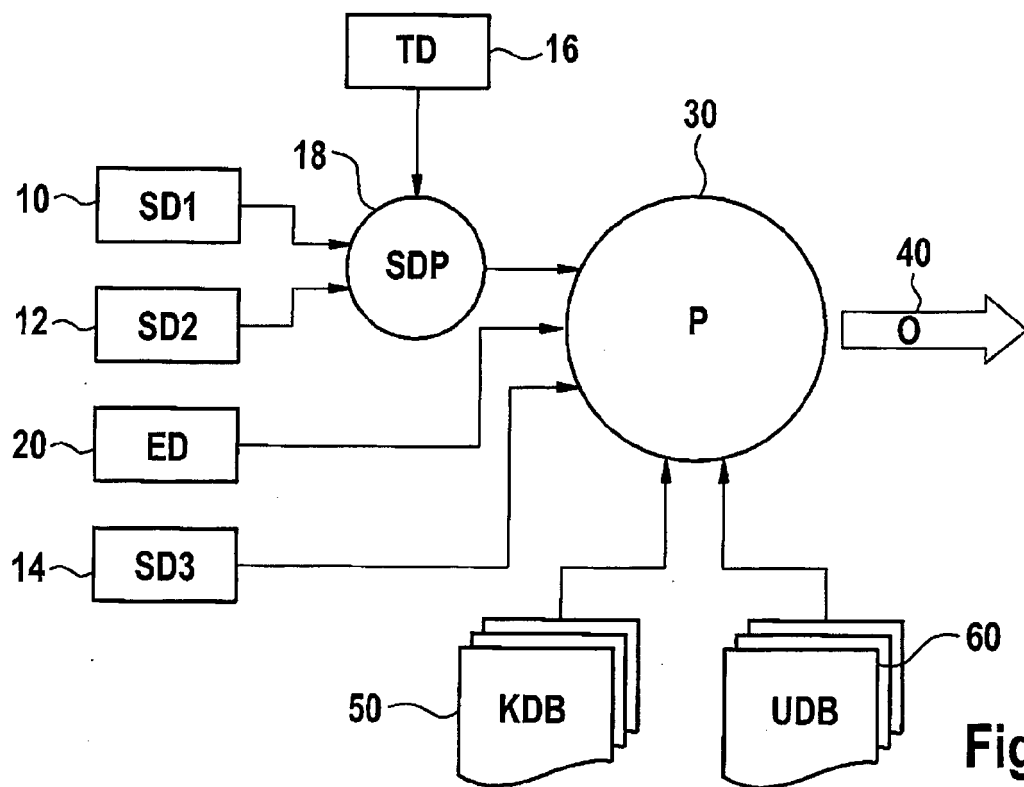


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 13 00 3135

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,P	EP 2 524 617 A2 (ROVCAL INC [US]) 21 November 2012 (2012-11-21) * paragraphs [0019] - [0045]; figures 1-12 *	1-17	INV. A45D1/04 A45D2/00 A45D6/20 A45D1/28
X,P	----- WO 2012/174168 A2 (HUMPHREYS JAMES D [US]; SHERMAN JOSEPH [US]; PHILLIPS SCOTT [CA]; MERC) 20 December 2012 (2012-12-20) * paragraphs [0024] - [0063]; figures 1-3 *	1-17	
X	----- US 2010/286754 A1 (BLY DEBORAH C [US]) 11 November 2010 (2010-11-11) * paragraphs [0010] - [0050]; figures 1-6 *	1-17	
X	----- GB 2 477 834 A (JEMELLA LTD [GB]) 17 August 2011 (2011-08-17) * paragraphs [0030] - [0082]; figures 6-20 *	1-17	
X	----- WO 2011/004340 A2 (BRAUN GMBH [DE]; SENG JUERGEN [DE]; SOERENSEN OLAF [DE]; SCHMITZ CHRIS) 13 January 2011 (2011-01-13) * page 3, line 10 - page 5, line 9 * * page 6, line 1 - page 7, line 8; figures 2,3 * -----	1-17	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 3 October 2013	Examiner Ionescu, C
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 13 00 3135

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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03-10-2013

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 2524617	A2	21-11-2012	EP 2524617 A2	21-11-2012
			US 2012291797 A1	22-11-2012

WO 2012174168	A2	20-12-2012	US 2012312320 A1	13-12-2012
			WO 2012174168 A2	20-12-2012

US 2010286754	A1	11-11-2010	NONE	

GB 2477834	A	17-08-2011	AU 2011298168 A1	04-04-2013
			CA 2809755 A1	08-03-2012
			CN 103228170 A	31-07-2013
			EP 2611328 A1	10-07-2013
			GB 2477834 A	17-08-2011
			GB 2497057 A	29-05-2013
			US 2012227758 A1	13-09-2012
			WO 2012028862 A1	08-03-2012

WO 2011004340	A2	13-01-2011	CN 102469863 A	23-05-2012
			EP 2272391 A1	12-01-2011
			JP 2012531997 A	13-12-2012
			RU 2011153059 A	20-08-2013
			US 2012055501 A1	08-03-2012
			WO 2011004340 A2	13-01-2011

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 3112384 A1, Mühelos-Werk Alfred Müller [0003]
- US 4602143 A [0005]