

This invention relates to a hair-care appliance comprising a housing for receiving the units adapted to be powered electrically, in particular a heating unit with a voltage tap and an electric motor, which are adapted to be brought into an operating position by means of a slide switch or a rotary switch.

A hair-care appliance of this type is already known from DE 39 03 231 A1.

Further, a hair dryer of this type is in prior public use, comprising a cylindrical housing with a round brush (AS13 air styling brush of Braun AG). This appliance is equipped with a slide switch comprising a switch enclosure with a fully integrated break or make contact element connected to the appropriate units by electrical conductors. The manufacture of this appliance involves great expenditure of time and material.

It is an object of the present invention to provide a further hair-care appliance which can be manufactured at reduced expenditure, provides in particular a simpler switch arrangement and affords greater ease of assembly.

In a hair-care appliance of the type initially referred to, this object is solved essentially in that an electrically conducting switching means provided with a switch contact is actuatable directly by the slide switch or the rotary switch, and that the switch contact, on actuation of the switching means by the slide switch or the rotary switch, is adapted to make direct electrical contact with the voltage tap of the heating unit. This establishes the supply of power directly between the electrically operable unit and a voltage source. In this manner, a series of components can be saved. Further, the need to provide the switch enclosure hitherto required for a separate switch is also obviated.

Advantageously, the slide switch acts directly through an operating cam on the resilient switching means, and the switching means is configured as a switch spring having one end connected to an electrical conductor while its other end is adapted to be directly connected to a voltage tap of the heating unit by means of the slide switch. Because the switch spring can be caused to contact the voltage tap or the mating contacts secured to the micanite plates directly, the requirement of having to provide components and connecting cables for the slide switch which are arranged in a separate switch enclosure is obviated.

In a further feature of the present invention, it is advantageous to provide the switch spring with an ascending bevel over which the operating cam of the slide switch is movable from an open position into a closed position. This enables the switch spring to be moved into its closed position with ease.

Further, it is advantageous to secure one end of the switch spring in a cantilever fashion on a mounting structure provided in the housing. This makes it possible to dispense with the need for further components, the more so since the housing of the hair-care appliance is capable of receiving the switch spring without requiring structural alterations.

It is of particular importance in the device of the present invention that the switch spring is fixedly connected to the voltage tap of the heating unit directly by clamping means, and that the switch spring is actuatable directly by means of the slide switch displaceable in the axial direction of the housing, or by means of the rotary switch encompassing the housing.

A still further advantage consists in that the switch spring or the slide switch or the rotary switch is associated with at least one detent means capable of locking the slide switch or the rotary switch in its individual positions.

The manufacturing expenditure can be reduced also in that the mounting structure carrying the switch spring is part of a cylindrical supporting structure fixedly connected with the brush for receiving the electrically operable units. By this means, the heating unit and the switching means can be readily integrated in the rear section of the integrally formed round brush. This also enables all electrical parts to be assembled in a prior operation, so that still further cost savings can be realized.

Owing to the advantageous configuration of the displaceable slide switch or rotary switch in combination with the switch spring arranged in the housing in a cantilever fashion which acts directly on voltage taps, it is possible to dispense with the need for complex and separate contact switches customary thus far and a separate enclosure for receiving the switching elements.

Further features of the present invention are set out in the subsequent description of the drawings, it being understood that any single feature and any

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combination of single features are essential to the present invention.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings, without the invention being limited to this particular embodiment. In the drawings,

FIG. 1a is a sectional view of a hair-care appliance having a housing which is configured as a handle receiving a slide switch thereon, with a brush being attachable;

FIG. 1b is a sectional view of a hair-care appliance illustrating a further embodiment in which the switch is configured as a rotary switch;

FIG. 2 is a sectional view taken along the line D-D of FIG. 1b;

FIG. 3 is a view of the slide switch of FIG. 1a on an enlarged scale;

FIG. 4 is a schematic view of a switch spring of FIG. 2; and

FIG. 5 is a sectional view of a clamping device for the switch spring, taken along the line E-E of FIG. 4.

In FIGS. 1a and 1b of the drawings, reference numeral 1 designates a hair-care appliance or a hair dryer comprised of a housing 3 including two shells 2 and a round brush 4.

As becomes apparent from FIG. 1, a brush 4 through which air is adapted to move and which is shown only in part in the drawings is attachable to the downstream end of the housing 3, the brush engaging against an end 10 of the housing 3 by means of flange 9 when a supporting structure 11 adjoining the flange 9 has been inserted into the interior of the housing 3. This limits the movement of the brush 4 farther into the housing interior.

An electric motor 18 has at its one end a drive shaft 23 for receiving coaxially thereon an axial flow fan 22 in the housing 3.

The supporting structure 11 received in the housing interior and integrally formed with a cylindrical section 6 of the brush 4 serves to accommodate a complete

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electric heating unit 16 connected to an electric motor 18 by means of conductors 17. The electric heating unit 16 is further connected to a power cord 21 by means of electrical conductors 19 and a contact element 20.

The electric motor 18 and the electric heating unit 16 are adapted to be turned on and off by means of a slide switch 25. The electric slide switch 25 may be configured as a single-step switch or as a multi-step switch and it may be slidably carried in the housing 3.

As becomes apparent from FIG. 1a, the slide switch 25 is received in a cutout 26 of a total length slightly exceeding the total length of the slide switch 25, thus enabling the slide switch to be displaced parallel to the longitudinal axis of the housing 3. The slide switch 25 may be slidably received in a dovetail guide, not shown in the drawings, which is provided in the housing 3.

According to FIGS. 1a and 3, the slide switch 25 includes a resilient switch spring 27 secured to a mounting structure 12 connected to the housing 3, the spring being movable by means of an operating cam 28 from the position shown in solid lines into a position shown in broken lines when viewing FIG. 3.

In the position shown in broken lines, the switch spring 27 is in engagement with a lug or a voltage tap 29 of the heating unit 16, so that in this switch position power is supplied to the heating unit 16.

The operating cam 28 illustrated in FIG. 3 is fastened to a link member, not shown in the drawings, which is connected to the slide switch 25, the cam traveling over the switch spring 27 as the slide switch 25 is displaced. By shifting the slide switch 25 back into the position illustrated in FIG. 3, the spring force causes the switch spring 27 to be returned to the position drawn in solid lines, thereby interrupting the supply of power to the heating unit 16.

In an advantageous manner, the switch spring 27 (FIG. 3) is provided with an ascending bevel 31 over which the operating cam 28 is moved. The ascending bevel 31 is part of a V-shaped detent means 38 preventing the slide switch 25 from being displaced unintentionally.

In a further embodiment shown in FIG. 1b, a switch ring or rotary switch 32 adapted to be rotated relative to the housing 3 about the longitudinal axis of the hair-

care appliance 1 is substituted for a slide switch 25 movable in the axial direction of the housing 3.

The switch ring or rotary switch 32 has on its inside operating cams 28' to 28'' which follow the rotation of the switch ring 32, so that on a displacement of the switch ring 32 the operating cam 28' travels along an ascending bevel 31 (FIG. 4) of a switch spring 27', urging the spring radially inwardly. As a result, the switch spring 27' is moved, by means of a switch contact 35 arranged on the switch spring 27', into abutment with the right-hand voltage tap 29'' (FIG. 2) of the heating unit 16 disposed on a supporting frame 36, thereby connecting the heating unit 16 to the power supply.

FIG. 2 illustrates the individual voltage taps 29' to 29''. Spaced from the first operating cam 28' is a second operating cam 28'', and at a relative distance thereto a third operating cam 28''', so that further rotation of the switch ring 32 causes respective further switch springs 27'' and 27''' to engage the voltage taps 29'' in succession, releasing in this manner different switch functions, so that the circuit for different operating modes is either closed or opened.

To prevent unintentional displacement of the switch ring 32, detent means, not shown in the drawings, are provided on the inside of the housing 3, which detent means are operative for locking engagement with respective recesses, thus enabling the switch ring 32 to be locked in the desired switch positions.

The switch springs 27' to 27''' shown in FIGS. 2 and 4 return to their initial positions, opening the switch contact 35, as soon as the operating cams 28' to 28''' have been returned to their initial positions shown in FIG. 2.

As becomes apparent from FIGS. 2 and 4, the switch spring 27' to 27''' is comprised of a link member 33 providing at least one resilient bow section 30 having a recess 24 for receiving the operating cam 28' provided on the switch ring 32. Further, the recess 24 in the switch spring 27' also includes the ascending bevel 31', so that on a displacement of the switch ring 32 in the direction of the ascending bevel 31', the operating cam 28' is capable of traveling over the ascending bevel 31' readily, urging as this occurs the switch spring 27' radially in the direction of the center line of the hair-care appliance 1. Particularly according to FIG. 2, the switching means of FIG. 4 may also be configured as a link member

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33 having switch springs 27' and 27" arranged on either side thereof. The special configuration selected is determined by the electric circuit configuration of the appliance.

The operating cams 28" and 28'" which are merely slightly longer than the operating cam 28' are moved into engagement with the switch springs 27" and 27'" in a similar manner, thereby effecting a radial displacement of the switch contact 35, thus enabling the electric motor 18 and/or the heating unit 16 to be set to different operating modes.

As appears from FIG. 5, the link member 33 of the switch springs 27' and 27" is directly connected to the associated voltage tap 29' and secured by clamping means 5 which to this end are bent towards one side of the link member 33. The clamping means 5 are integrally formed with the voltage tap 29. This enables the electrically conducting switching means or the switch springs 27' to 27" to be actuated directly by the slide switch 25 or by the rotary switch 32, thereby dispensing with the need to provide a separate switch in a suitable enclosure. The same applies correspondingly to the switch spring 27'" which includes only one resilient element. The otherwise requisite circuit wiring between the heating unit 16 and such a switch can thus be dispensed with because the switching means is directly connected to the voltage tap 29 of the heating unit 16.

Patent Claims

1. A hair-care appliance comprising a housing (3) for receiving the units adapted to be powered electrically, in particular a heating unit (16) with a voltage tap (29 - 29'") and an electric motor (18), which are adapted to be brought into an operating position by means of a slide switch (25) or a rotary switch (32), characterized in that an electrically conducting switching means (27 - 27'") provided with a switch contact (35) is actuatable directly by the slide switch or the rotary switch (25, 32), and that the switch contact (35), on actuation of the switching means (27 - 27'") by the slide switch or the rotary switch (25, 32), is adapted to make direct electrical contact with the voltage tap (29 - 29'") of the heating unit (16).

2. A hair-care appliance as claimed in claim 1, characterized in that the slide switch or the rotary switch (25, 32) acts directly through an operating cam (28 to 28'") on the resilient switching means (27 to 27'").

3. A hair-care appliance as claimed in claim 1 or claim 2, characterized in that the switching means is configured as a switch spring (27 to 27'") having one end connected to a power supply (21) while its other end is adapted to be directly connected to a voltage tap (29 - 29'") of the heating unit (16) by displacement of the slide switch or the rotary switch (25, 32).

4. A hair-care appliance as claimed in one or several of the preceding claims, characterized in that the switch spring (27) is provided with an ascending bevel (31) over which the operating cam (28) of the slide switch (25) is movable from an open into a closed position.

5. A hair-care appliance as claimed in one or several of the preceding claims, characterized in that one end of the switch spring (27) is secured in a cantilever fashion on a mounting structure (12) provided in the housing (3).

6. A hair-care appliance as claimed in one or several of the preceding claims, characterized in that the switch spring (27' to 27'") is directly connected to the voltage tap (29 - 29'") of the heating unit (16).



7. A hair-care appliance as claimed in one or several of the preceding claims, characterized in that the switch spring (27' to 27'") is fixedly connected to the voltage tap (29 - 29'") of the heating unit (16) by clamping means (5).

8. A hair-care appliance as claimed in one or several of the preceding claims, characterized in that the switch spring (27) is actuatable directly by means of the slide switch (25) displaceable in the axial direction of the housing (3), or by means of the rotary switch (32) encompassing the housing (3).

9. A hair-care appliance as claimed in one or several of the preceding claims, characterized in that the switch spring (27) or the slide switch or the rotary switch (25, 32) is associated with at least one detent means (38) capable of locking the slide switch or the rotary switch (25, 32) in its individual positions.

10. A hair-care appliance as claimed in one or several of the preceding claims, characterized in that the rotary switch (32) includes at least one detent means suitable for locking engagement with a detent cam.

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