

This invention relates to an electric shaving apparatus according to the prior-art portion of claim 1.

In a shaving apparatus of the type referred to in the invention DE 37 26 354 C2, it is known to provide on the housing of the shaving apparatus a shaving head which is adapted to pivot freely in any pivotal position and is associated with an actuating switch slidably mounted on the housing. The actuating switch is operatively associated with a control device serving to displace a slidably mounted control element which is guided along a cam path, engages in the pivot area of the shaving head and limits the pivotal movement of the shaving head. With this control device, the shaving head can not be locked in position until after operation of the shaving apparatus is started, a locked position being not possible in the Off condition of the shaving apparatus.

From DE-C-40 00 689, a shaving apparatus adapted to be powered by electric current is known, in which a shaving head is pivotally mounted in side arms of a frame disposed on the housing. To protect the outer cutter and to secure the shaving head in a locked position when the shaving apparatus is in transit, a protective cap is seated on the shaving head, which cap has in its end cheeks recesses conformed to the outer contour of the side arms. When the protective cap is seated in place, the recesses are slipped onto the side arms in positive engagement therewith, thus securing the shaving head against pivotal motion.

Accordingly, it is an object of the present invention to provide an improved electric shaving apparatus.

This object is accomplished by the present invention with an electric shaving apparatus incorporating the features of claim 1.

It is accordingly ensured that on displacement of the slide switch from an operating position into an Off position the shaving head automatically occupies its mid-position in which it is locked or located in position. As a result, the appliance can be cleaned with substantially greater ease than has hitherto been possible. In particular in transit, the shaving head is prevented from moving to and fro. The control device of the present invention operates independently of other control devices provided for positioning the pivotally mounted shaving head during shaving, that is, with the shaving apparatus in operation.

In a further feature of the present invention, the slide member is equipped with a receiving means accommodating a spring bearing with one end against a stationary part of the shaving apparatus and with its other end against the slide member, the spring urging the slide member into a position locking the shaving head when the actuating switch is in a particular position. As a result of this arrangement, the slide member is automatically moved into a position allowing a pivotal movement of the shaving head when the actuating switch is moved from its Off position into an operating position, thereby enabling the shaving head to pivot freely relative to the housing about its axis.

In still another feature of the present invention, a second cam path or sliding path is advantageously arranged opposite the cam path formed in the shaving head, which second cam path is provided between the outer cutter of the shaving apparatus and the first cam path, and in the position allowing a pivotal movement of the shaving head the outer end of the slide member is movable into abutting engagement with the second cam path, cushioning the pivotal movement of the shaving head. This is a simple means of preventing the occurrence of disagreeable noise during shaving motions, in particular rattling, striking or bouncing noise.

In a preferred embodiment of the present invention, a head provided at the outer end of the slide member is arranged to protrude from one side of the slide member, and the slide member is received in a cavity provided in the housing of the shaving apparatus and extends through a cutout of a shaving head carrier associated with the shaving head.

Further advantageous embodiments of the present invention are set out and illustrated in the subclaims, the description and, respectively, the Figures.

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

FIG. 1 is a perspective view of a shaving apparatus including a pivotally mounted shaving head as well as an actuating switch equipped with a long-hair trimmer;

FIG. 2 is an exploded view of the shaving head and part of the housing body of a shaving apparatus, with the walls of the housing body being partly broken away, as

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well as an actuating switch arranged on the front panel and cooperating with a slide member for locking the shaving head in position, the housing having been omitted for improved clarity of the illustration of the shaver function; and

FIG. 3 is a partial longitudinal sectional view of the shaving apparatus of FIG. 1 including the pivotally mounted shaving head.

Referring now to FIG. 1 of the drawings, there is shown an electric shaving apparatus having a housing 1 and a shaving head 2 pivotal relative to the housing about a pivotal axis Z from the mid-position shown into opposite directions, with two short-hair cutter assemblies K_1 , K_2 as well as an actuating switch 4 slidably arranged on the front panel 3 of the housing 1 and incorporating a built-in long-hair trimmer L. The shaving head 2 is pivotally mounted relative to the housing 1 and equipped with an outer cutter 36 and an inner cutter 31 operatively associated with the outer cutter 36 and driven by a motor. By means of bearing elements not shown in the drawings, the shaving head 2 is held in a freely pivotal relationship between two support lugs 5, 6 formed on the housing 1.

The actuating switch 4 integrally formed with the long-hair trimmer L is slidably mounted on the front panel 3 of the housing 1. Formed on the actuating switch 4 is a switch coulisse not shown in the drawings having four settings "0, 1, 2, 3" determining the individual positions of the actuating switch 4.

The position "Off" corresponds to the setting "0" of the actuating switch 4.

To operate the electric drive mechanism of the shaving apparatus and thus the cutter assembly or assemblies provided in the shaving head 2, the actuating switch 2 is pushed to position "1". Moving the actuating switch 4 to position "2" activates also the long-hair trimmer L integrated into the actuating switch.

FIG. 2 shows an exploded view of the shaving head 2 and the upper part of the housing 1 of a shaving apparatus in which the end walls of the housing 1 are partly broken away, as well as an actuating switch 4 arranged on the front panel 3 and configured as a dual switch comprising an actuating part not shown and a long-hair trimmer L. In the end walls 7 and 8 of the shaving head 2, bearing pins are provided by means of which the

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shaving head 2 is carried in bearing bores provided in the support lugs 5 and 6 so as to be pivotal about the pivotal axis Z. Pivot areas 10 of identical configuration are formed in the end walls 7 and 8. The pivot area 10 formed in the end wall 8 is configured as a recess. The end wall is constructed such as to provide a lower cam path 13 functioning as a sequential control element having a locating slot 14, with abutment stops 11, 12 being provided at the respective ends for limiting the cam path 13.

FIG. 3 further shows a partial representation of the shaving apparatus 1 of FIG. 1 incorporating a control means 30 for the pivoted shaving head.

Serving as a control element is a stepped slide member 33 which is carried in an end wall, not shown in FIG. 2, of the housing 1 and is slidable in the longitudinal direction of the shaving apparatus in opposition to the pressure of a spring 18 bearing with one end against the slide member 33 while its other end rests against a rib member 17 secured in the housing 1. The rib member 17 is fixedly connected to, that is, integrally formed with, parallel wall portions 23, 24 of the housing body 22.

Adjoining the cam path 13 is another cam path or sliding path 19 extending in convex shape at a distance to the cam path 13 and adapted for abutting engagement with a head 34 disposed on the slide member 33, such abutment occurring when the slide member 33 has been displaced on movement of the actuating switch 4 from position "0" to any one of the positions "1" to "3".

The slide member 33 is arranged underneath the actuating switch 4, extending through an aperture 32 provided between the actuating switch 4 and the rib member 17.

At its right-hand end when viewing FIG. 2, that is, at its end remote from the shaving head 2, the slide member 33 has a hook 15 engaging in an opening 20 provided on the actuating switch 4, the opening being configured as an elongate hole which is open downwardly relative to the direction of movement of the actuating switch 4, that is, it has such a large clearance that a displacement of the actuating switch 4 into any one of the positions "1", "2" or "3" has no effect on the position of the slide member 33. By contrast, if the actuating switch 4 is moved from position "1" to position "0", a stop wall 21 in the opening 20 will engage the hook 15, shifting the slide member 33 into the position "0".

At the upper end of the housing body 22, a shaving head carrier 25 is provided for pivotally mounting the shaving head 2 which is pivotally received only in the support lugs 5, 6 illustrated in FIG. 1.

At the one end of the shaving head carrier 25, a rectangular cutout 26 configured as a guiding means for the slide member is provided, the cutout receiving the upper end of the slide member 33 in a slidable relationship thereto.

As becomes further apparent from FIG. 2, the upper end of a stepped portion 33' of the slide member is adjustably received in a cavity 35 formed between the shaving head carrier 25 and the rib member 17. The stepped portion 33' of the slide member 33 includes a blind-end hole 27 for accommodating the spring 18 bearing with one end against the inner end of the blind-end hole 27 while its other end takes support upon the rib member 17, thereby urging the slide member 33 with its head 34 into abutment with the slide path 19 when the actuating switch 4 is in any one of the positions "1", "2" or "3".

As becomes apparent from FIGS. 2 and 3, the head 34 is fixedly attached to the upper end of the slide member 33 and, with the actuating switch 4 in the position "0", is inserted into the locating slot 14 provided in the cam path 13, thereby preventing the shaving head 2 from being pivoted about its pivotal axis Z. The shaving head 2 being locked in this position, it can be cleaned with substantially greater ease after the shave.

For this purpose, the actuating switch 4 is pushed from position "1" to position "0". This involves movement of the stop wall 21 of the actuating switch 4 into abutting engagement with the hook 15 of the slide member 33 which is displaced to the right when viewing the drawing. As this operation occurs, the head 34 of the slide member will be simultaneously displaced in the direction of the interior of the housing 1. If the shaving head 2 is in an inclined position, the head 34 of the slide member will travel along the surface of the cam path 13, thereby forcing the shaving head 2 into its mid-position shown in FIG. 3, locking it in this position.

When the actuating switch 4 is pushed from position "0", that is from the position locking the shaving head 2, to position "1", the spring 18 will urge the slide member 33 into the direction of the shaving head 2, causing the head 34 of the slide member to be disengaged from its locating slot 14. As becomes apparent from the dot-

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and-dash lines of FIG. 2, the head 34 may protrude laterally from the upper end of the slide member 33, enabling the outer end surface of the slide member 33 to abut the inner end wall 8 of the shaving head 2 if the cutout 26 is laterally open. In position "1", the end of the slide member 33 pointing in the direction of the shaving head 2 as well as the end of the head 34 pointing upwardly rest against the slide path 19 of the shaving head 2. By virtue of the sliding friction produced by the abutting engagement between the surface of the slide path 19 and the respective outer ends of the slide member 33 and the head 34, a small cushioning effect is achieved preventing noise caused by movements including, for example, rattling, bouncing or hard striking of the shaving head 2.

When the actuating switch 4 is moved to the next setting "2" or "3", further displacement of the slide member 33 through the actuating switch 4 is prevented from occurring due to the correspondingly large opening 20, that is, the connection between the actuating switch 4 and the slide member 33 is interrupted in the settings "1", "2" or "3".

While the slide member 33 is illustrated as being provided at only one end in FIGS. 2 and 3, it will be understood that it may be provided at both ends of the shaving apparatus.

On returning the actuating switch 4 to position "Off", that is, the "0" setting, the electric drive of the shaving apparatus will be deactivated, and the head 34 of the slide member will again lock the shaving head 2 in its mid-position.

The components of the control device for the shaving head 2 pivotally mounted about the pivotal axis Z as described in FIGS. 1 to 3 may be arranged in a symmetrical relationship to each other on one of the end walls of the shaving apparatus shown.



Patent Claims

1. An electric shaving apparatus having a housing (1) and a shaving head (2) mounted so as to be pivotal relative to the housing (1) about a pivotal axis (Z), further having at least one actuating switch (4) provided on the housing (1) and adapted to be coupled to a control device cooperating with a slidably mounted slide member (33) engaging in the pivot area (10) of the shaving head (2), said slide member being movable into abutting engagement with a cam path (13) for the purpose of locking the shaving head (2) in at least one position, characterized in that the cam path (13) is of a concave and concentric configuration relative to the pivotal axis (Z) of the shaving head (2) and includes a lower locating slot (14) concentrically formed in the cam path (13), said slot being engaged by the slide member (33) on a displacement of the actuating switch (4) into the Off position (setting "0"), thereby forcing the shaving head (2) to be locked in a mid-position, said slide member (33) having at its end proximate to the shaving head (2) a head (34) which, on displacement of the actuating switch (4) into the Off position "0" is guided along the cam path (13) until the head (34) is introduced into the locating slot (14) of the cam path (13).

2. The shaving apparatus as claimed in claim 1, characterized in that the slide member (33) is equipped with a receiving means (27) accommodating a spring (18) bearing with one end against a stationary rib member (17) of the shaving apparatus and with its other end against the slide member (33), said spring urging the slide member (33) into a position unlocking the shaving head (2) when the actuating switch (4) is displaced to an operating position.

3. The shaving apparatus as claimed in any one of the preceding claims, characterized in that a second cam path or sliding path (19) is arranged opposite the cam path (13) formed in the shaving head (2).

4. The shaving apparatus as claimed in any one of the preceding claims, characterized in that in the operating position the outer end of the slide member (33) is movable into abutting engagement with the second cam path or sliding path (19), cushioning the movement of the shaving head (2).



EP 92 114 062.0
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- 8 -

5. The shaving apparatus as claimed in any one of the preceding claims, characterized in that the head (34) provided at the outer end of the slide member (33) is arranged to protrude from one side of the slide member (33).

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