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3,307,257

HAIR CLIPPER

Original Filed April 15, 1963

2 Sheets-Sheet 1

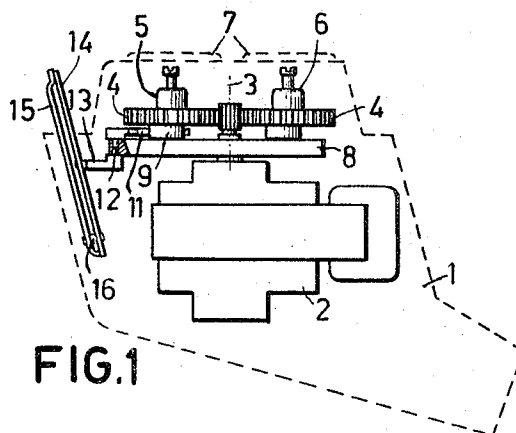


FIG. 1

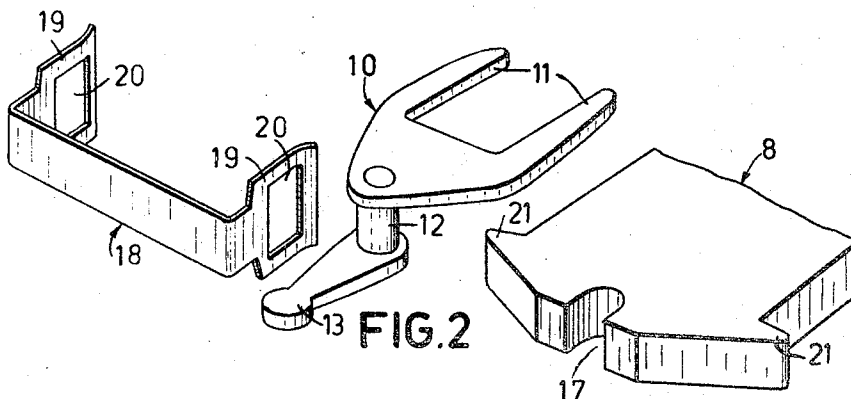


FIG. 2

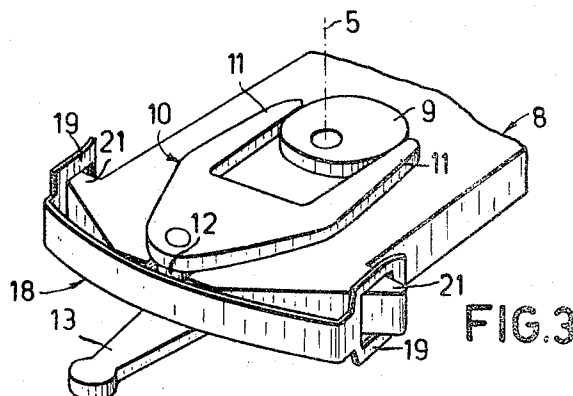


FIG. 3

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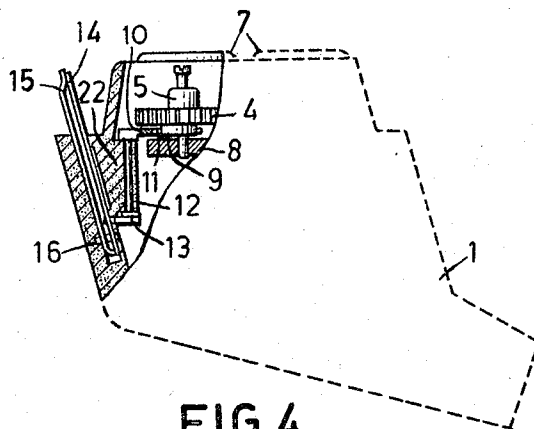


FIG. 4

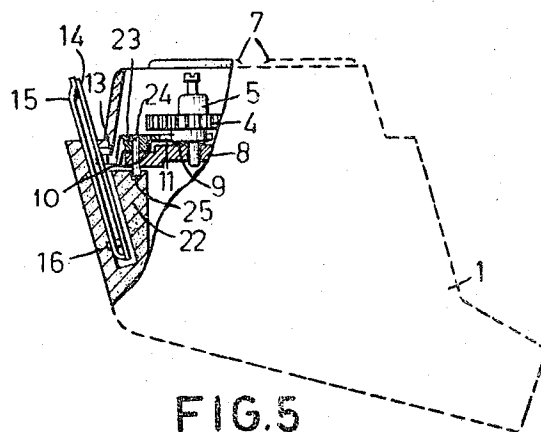


FIG. 5

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HAIR CLIPPER

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Continuation of application Ser. No. 273,023, Apr. 15, 1963. This application July 26, 1965, Ser. No. 474,556
Claims priority, application Netherlands, Apr. 17, 1962, 277,370

4 Claims. (Cl. 30—34.1)

This application is a continuation of application Serial No. 273,023, filed April 15, 1963, now abandoned, entitled, "Hair Clipper."

This invention relates to a dry shaving apparatus comprising means for permanently mounting a pair of hair clippers at the side of the shaving head in a position transverse to the plane of shaving, said hair clippers being driven by the normal drive unit of the shaving head.

In known devices of the kind set forth there are shaving apparatus which comprise a rocking, cutting member driven by a rocking driving pin. The hair clippers are then arranged at the side of the shaving head so that the direction of motion of the cutting plate of the hair clippers is parallel to that of the cutting member of the shaving head. Thus, the shear plate of the hair clippers may be driven by the same driving pin, which is to this end provided with a suitable side arm.

The invention has for its principal object the provision of a driving member which allows a greater freedom in arranging the hair clippers and is characterized in that an eccentric arranged on a rotating driving shaft of a shaving cutter cooperates with a fork, which grips the eccentric by its prongs at one end and is provided at the other end with a driving pin extending transversely to the shear plate of the hair clippers, whereas an intermediate connecting piece forming the rotary shaft of the fork is journaled in a part of the apparatus.

Shaving apparatus having a rotating driving shaft are thus provided in a simple manner together with a drive for hair clippers while the place of the hair clippers on the side of the apparatus can be freely chosen, i.e., in accordance with other requirements.

It is known to provide a rotating driving spindle with an eccentric which co-acts with hair clippers. With such a known device the eccentric urges the shear plate of the hair clippers, said plate being pivotable about a spindle, against a spring force to one side out of the state of equilibrium by the cooperation of the eccentric with an arm connected with the shear plate of the clippers. The return motion of the shear plate of the clippers is obtained by the action of the spring which is connected to the clippers. The eccentric and hence the drive are therefore operative only during half of the rocking motion and must, in addition, overcome the spring pressure of the clippers. It should furthermore be noted that the hair clippers are not transverse, but parallel to the shaving plane, which is inconvenient for many users.

Another object of the invention is the provision of a bearing on the rotary shaft on the fork comprising at least the point where it applies that the ratio between the distance of said point from the junction with the fork and with the driving pin is equal to the ratio between the lengths of the lever arms of the fork.

This has the advantage that a simple and small bearing suffices, since it is located at a place (on the line of connection between the driving point and the driven point) so that the torques not coinciding with the rotary shaft are overcome. This permits the use of a fork having a comparatively long stem, which is moreover convenient in the choice of the length of the spindle with respect to the driving point of the clippers relative to the shaving apparatus.

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A suitable embodiment of the invention furthermore resides in that the stem of the fork is journaled in a peripheral groove in a frame plate connected with the motor block and is surrounded by a blade spring curved around the peripheral part.

This provides a simple mounting of the fork, which can thus be readily removed and, if necessary, replaced.

A preferred embodiment of the present invention has the feature that the stem of the fork is formed by a hub comprising a spindle which is inserted with close fit through a frame plate in which is also journaled the eccentric shaft driving the fork. However, one end of said spindle, protruding beyond the frame plate, is centered in the wall of the housing.

This provides an accurately determined location of the rotary axis of the fork with respect to the housing, while the tolerance for the clippers, which are usually mounted on the housing and, in addition, the tolerance for the motor shaft are small, since the fork is also journaled in the frame plate accommodating the motor shaft.

The invention will now be described more fully with reference to the drawing, in which

FIG. 1 shows diagrammatically a side elevation of the relative arrangement of the main parts which are essential for the invention, inside the housing;

FIG. 2 is a perspective view of detached parts of a detail of FIG. 1,

FIG. 3 shows the same detail as FIG. 2 in the mounted state,

FIG. 4 is a side elevation of a second embodiment of the invention, in which a part is shown diagrammatically in a sectional view and

FIG. 5 shows similarly to FIG. 4 a side elevation and partly a sectional view of a third embodiment of the invention.

Referring to the drawings, the housing 1 comprises a motor block 2, the main shaft 3 of which drives two gear wheels 4, which are secured to spindles 5, 6 which drive the rotating cutters (not shown) of the shaving head 7. The spindles 5, 6 are journaled in a frame plate 8, which is mounted on the motor block 2. This assembly is mounted in a suitable manner in the housing 1. Between the gear wheel 4 and the frame plate 8 the spindle 5 is provided with an eccentric 9. A fork 10 has two prongs 11 which engage the eccentric 9. The fork 10 is provided with a spindle 12 which is journaled in the frame plate 8. Furthermore, the fork 10 has a driving pin 13 which is secured to the spindle 12 and extends in a direction opposite to that of the prongs 11. When the motor rotates, the rotating motion of the spindle 5 is converted with the aid of the eccentric 9 and the fork 10 into a rocking motion of the driving pin 13. This rocking motion is transferred to the movable shear plate 14 of hair clippers 15, since the driving arm or pin 13, which is transverse to the shear plate 14 of the clippers engages a recess in the shear plate, which plate is pivotable about the point of rotation 15.

The clippers 15 are arranged in a most desirable manner in the wall of the housing 1.

The bearing for the fork spindle 12 is formed by a groove or slot 17 in an edge of the frame plate 8. The fork spindle is arranged in the slot 17, after which the opening of the slot is closed by a blade spring 18, which is provided with bent-over ends 18 having openings or eye-lets 20. The ends 19 grip around lugs 21, which are provided on the sides of the frame plate 8. The corners of the frame plate are slightly bevelled to the rear, so that the spring body is clamped against the end of the frame plate, which is provided with the slot 17.

In this embodiment, as in the embodiment to be described hereinafter, the line of connection between the point where the eccentric 9 drives the fork 11 and the

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driving end of the arm 13 divides the spindle 12 into a portion which is engaged by the bearing slot 17 creating the effect described hereinbefore.

In the embodiment shown in FIG. 4 a fork 10 is arranged in an identical manner so that its prongs 11 grip an eccentric 9 on the spindle 5. The fork spindle 12 is journaled, however, in a bore of an inwardly protruding part 22 of the wall of the housing 1, to which also the hair clippers are attached. The position of the fork 10 with respect to the clippers 15 thus has a small tolerance with the same accuracy in manufacture, which may often be of greater importance than the tolerance for the drive of the fork. FIG. 4, shows, in addition, a longer fork spindle 12 with a lower point of connection of the driving arm 13 to the hair clippers than in the first embodiment.

In the embodiment shown in FIG. 5 a fork 10 is shown, with which the connecting piece between the prongs 11 and the driving arm 13 is formed by a hub 23, which rotates on a shaft or pin 24, around which the fork is adapted to pivot. This shaft or pin 24 is journaled in the frame plate 8 and is centered by an end 25 protruding from the plate in an inwardly projecting portion of the housing 22. This provides an accurate disposition both with respect to the housing and to the eccentric disc 9.

In practice the frame plate 8 with the driving members for the cutters are centered on the motor block 2. Then the shaving head 7 is centered thereon and subsequently the housing 1 is centered in turn on the shaving head 7. In the present embodiment the tolerance for the fork with respect to the hair clippers is not fixed along these lines, since the position of the fork is determined at the same time directly in the frame plate 8 and in the housing 1.

I claim:

1. A hair clipper for a dry shaving apparatus having at least one drive shaft and a cutter mounted therein comprising a frame plate for mounting said hair clipper laterally of said cutters, an eccentric mounted on said drive shaft, a bifurcated element having the legs thereof engaged by said eccentric, a driving arm having one end connected to said hair clipper, said frame plate having a

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peripheral slot, and an intermediate connecting part being a spindle journaled in said slot, a blade spring enclosing said spindle in said slot, said spindle being connected at one end to the other end of said driving arm and at the other end to said bifurcated element.

2. A hair clipper for a dry shaving apparatus as claimed in claim 1 wherein said frame plate is provided with spaced lugs, said blade spring having an eyelet at opposite ends thereof whereby the latter fits about corresponding lugs for securing said spindle in said slot.

3. A hair clipper for a dry shaving apparatus having at least one drive shaft and a cutter mounted thereon comprising means for mounting said hair clipper laterally of said cutter, an eccentric mounted on said drive shaft, a bifurcated element having the legs thereof engaged by said eccentric, a driving arm having one end connected to said hair clipper, an intermediate connecting part extending substantially perpendicular to said one end and connecting said driving arm to said bifurcated element, a frame plate having said drive shaft and said eccentric mounted thereon, said frame plate provided with a projecting pin spaced from said drive shaft and eccentric, said intermediate connecting part including an apertured hub of a length greater than the thickness of said frame plate in order to form a bearing surface for said projecting pin whereby said hair cutter oscillates upon the rotation of said drive shaft.

4. A hair clipper as claimed in claim 3 further comprising a gear driven by said drive shaft and said eccentric being affixed to said gear.

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