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3,144,714

CUTTING HEAD FOR DRY SHAVER

Filed Nov. 23, 1962

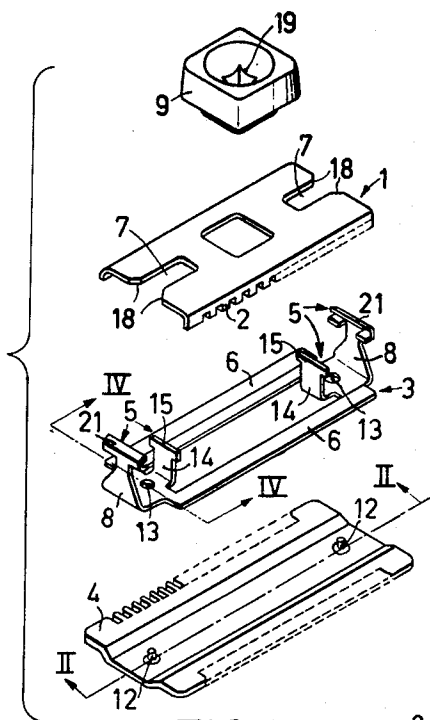


FIG. 1

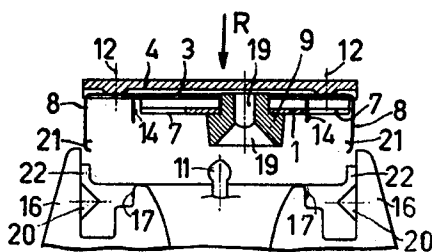


FIG. 2

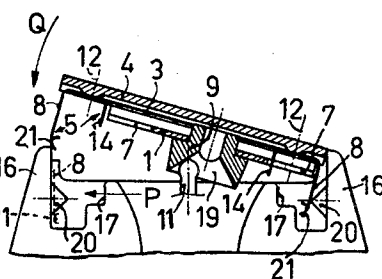


FIG. 3

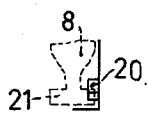


FIG. 3a

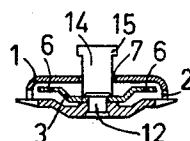


FIG. 4

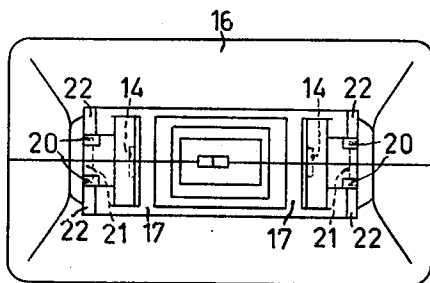


FIG. 5

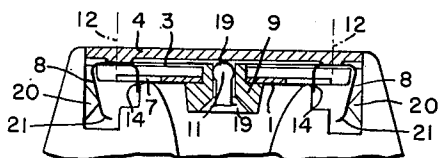


FIG. 6

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CUTTING HEAD FOR DRY SHAVER

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6 Claims. (Cl. 30-43.92)

The invention relates to a cutting head for a shaving apparatus having transverse driving, in which one of the cutting plates provided with teeth on both longitudinal sides is fixed by means of a U-shaped brace connected therewith, the limbs of which are connected on both sides to the housing of the motor, while the movable cutting plate is provided with notches on both ends which embrace limbs of the brace.

Such devices are known, in which, however, the brace with its substantially square cross-section is sunk in a central longitudinal slot of the fixed blade. This known construction has the drawback that it results in a rather complicated form of the blades and a comparatively thick cutting head.

In addition it is known to construct the fixed cutting plate as such in the form of a brace, as a result of which, however, also a rather heavy and expensive construction is obtained, since difficulties are encountered in fulfilling the various requirements, for the cutting function, the fastening and the guiding of the movable blade.

The object of the invention is to provide a cutting head for shaving apparatus which can be manufactured in mass production with comparatively low costs and which can be made available in a light construction, while rigid requirements as regards durability and reliability are satisfied.

The invention is characterized in that the body of the connection brace connected to the fixed cutting plate is formed by a metal plate provided between the fixed and the movable cutting plates and extending throughout the greater part of the width thereof, the longitudinal edges of which plate constituting guides for the movable cutting plate.

The connecting brace consisting of sheet metal lies entirely enclosed in this manner which is in favor of the appearance but in addition the body of this part which may be given a light construction also directly forms the guide for the movable blade, while in this form it is suitable for obtaining further simplifications and improvements, for which purpose a favourable embodiment is characterized in that each limb of the connecting brace is formed from two resilient pieces of plate extending substantially in parallel with each other, the inner of which pieces forming a lug which is embraced by the corresponding notch of the final edge of the moving blade and the outer of which forms a connecting lug which is provided with a spring catch with the motor housing.

So in this case the function of the limbs of the brace is distributed for each brace over the two lugs of which the limb consists, while using the spring action thereof, as a result of which a cutting head is obtained which can rigidly be connected and which has easily removable cutting plates.

According to one embodiment the whole connection may easily be constructed while enclosed and this embodiment is characterized in that the connection lugs fall within recesses inside the side walls of the motor housing and co-operate with parts of the spring catch provided therein.

A further embodiment is characterized in that the inner lugs of each brace limb laterally support in a clamping manner fixed surfaces of engagement provided in the motor housing.

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Whereas according to the known constructions vibration of the fixed cutting plate is prevented, for example by a heavy construction of the brace, according to the latter embodiment of the invention the same end is obtained but with a light brace consisting of sheet metal in a simple manner in that the resistance against vibration supplied by the outer connection lugs is completed by the said engagement of the inner lugs. Herewith it becomes possible to easily remove the set of cutting plates and yet obtain a sufficient safeguarding against vibration of the fixed cutting plate with the driving.

In addition to the inner lugs the function can be given in a simple manner of taking along the moving cutting plate when removing the fixed cutting plate, because the inner lugs and in a laterally widened head which overlaps the edges of the notches provided in the short sides of the movable cutting plates.

When removing the cutting head the movable blade with the outer fixed blade is taken along because the first blade remains attached to the said lugs.

In order that the invention may readily be carried into effect, one embodiment thereof will now be described more fully, by way of example, with reference to the diagrammatic drawing, in which:

FIG. 1 is a perspective view of the dismantled component parts;

FIG. 2 is a longitudinal cross-sectional view taken on the line II-II in FIGURE 1 of the mantled cutting head with part of the motor housing;

FIGURE 3 is the same cross-section as FIGURE 2 shows the cutting head in an oblique position, a limb of the brace being slid in the housing, and FIG. 3a shows a detail in side elevation;

FIGURE 4 is a cross-section taken on the line IV-IV in FIGURE 1 of the mantled cutting head;

FIGURE 5 is a plan view of the motor housing.

FIG. 6 is a cross sectional view of the present device with the parts thereof in their assembled condition.

In FIGURES 1 and 4 the component parts are shown in an upside down position with respect to the position shown in FIGURES 2 and 3.

The cutting head consists mainly of a movable cutting plate 1 having a bent edge of teeth 2, a U-shaped connection brace or frame 3 and a fixed cutting plate 4.

The connection frame 3, the limbs of which are indicated by 5 and are of a double construction, is manufactured of thin resilient sheet metal. This is punched in a manner such that longitudinal strips 6 remain which, as shown in FIGURE 4, guide the edge of teeth 2 of the movable blade 1. In addition, cut-in longitudinal slots 7 are visible on the short sides of this blade.

The first pair of legs of the frame 3 which form the actual connection with the motor housing are designated by 8. A driving cone 9 is fixed in the movable blade 1 and the head of the driving journal driven by the motor shaft in a vibrating motion is indicated by 11 in FIGURES 2 and 3.

The fixed cutting plate 4 is provided with two flanged eyelets 12 (see FIGURES 1 and 4), of which in FIGURES 2 and 3 only the center lines are indicated, which are passed through apertures 13 (FIGURE 1) on either side of the body of the frame 3 and with which this frame is rigidly connected to the plate 4.

By means of material which is punched out of the central part of the body of the connection frame 3 and is bent at right angles to the plane thereof, the second pair of legs 14 are formed which extend in parallel with the connection legs 8 of the limbs 5. At the end, the legs are widened on either side, so that a widened head 15 is formed which legs embrace the edges of the slots 7 of the movable blade 1 (FIGURES 1 and 4), as a result of which this is detachably and slidably connected to the frame 3.

However, the legs 14 also form an additional support against vibration in a longitudinal direction of the fixed cutting plate 4 with the movable cutting plate 1, because these resilient legs engage with some pressure transverse ribs 17 provided in the motor housing 16.

In addition, the movable cutting plate 1 after removing the cutting head may be removed by sliding the cutting plate to the left or to the right through such a distance that the end edge of the slot 7 abuts against a leg 14. At the one end the cutting plate may then be lifted and guided beyond the widened head 15 of the leg located on that side possibly by forcing it slightly to the exterior in a resilient manner. In order to prevent that when fixing the cutting head to the motor housing—when by the fixing movement itself the blade 1 has to be brought from such an extreme position into a position in which both legs provide guidance—the blade during its movement to the center would abut with its free end against a leg 14 and consequently could not be brought further into its work position the slots 7, are provided with bevelled corners as indicated by 18.

In addition, as shown in FIGURE 3, the cone 9 is constructed with a widening such that the driving pin 11 during fixing the cutting head in an oblique position and with the movable blade 7 in the position slid most laterally, all the same engages already therein and, on further pressing the cutting head, is automatically guided into the central aperture 19.

A spring catch of the shaving head in the motor housing is obtained by means of the outer legs 8 of the limbs 5 because in the housing 16 (see also FIGURES 3a and 5) on either side a pair of abutment stops 20 are provided which project at right angles to the principal surface of the corresponding leg 8. Each leg 8 ends in a rib 21 projecting on either side beyond the central portion of the leg which rib is obtained by bending that end of the leg concave. It may be seen from FIGURE 3 that if the one end of the cutting head is guided into the orifice of the motor housing 16 and is forced against the side thereof, the rib 21 on that side lies below the most projecting point of the abutment stop 20 and the edge of the concave rib 21 on the other side already falls within the orifice edge of the housing. If that side is further forced downwards in the direction of the arrow Q, in which the legs 8 may pass inwardly in a resilient manner, the ends of each rib 21 projecting on either side beyond the central portion of the leg 8 snap beyond the most projecting points of each pair of abutment stops 20. This is facilitated by the inclined surface of the abutment stops 20, while the inclined lower surface, under the action of the resilient legs 8, holds the shaving head downwards in the position in which the corners of the fixed cutting plate 4 engage the abutment stops 22 of the motor housing.

In addition it may be seen from FIGURE 3 that the legs 14 will also be passed along and in a resilient manner against the side of the ribs 17 because the upper edge thereof is rounded.

It appears from FIGURE 2 that the shaving head may also be inserted and removed again without objection in an upright position in the direction of the arrow R.

What is claimed is:

1. A cutting head for a dry shaver having a reciprocating driving means comprising a housing, a fixed cutting plate, a movable cutting plate provided with cutting teeth and notches at opposite ends thereof, a substantially U-shaped frame having a first pair of legs thereof removably connected to said housing, a second pair of legs on said frame insertable in the notches of said cutting plate, said frame being rigidly connected to said fixed cutting plate, the body of said frame being located between said fixed and movable cutting plates, and the longitudinal edges of said fixed plate constituting guides for said movable cutting plate.

2. A cutting head for a dry shaver having a reciprocating driving means comprising a housing, a fixed cutting plate, a movable cutting plate provided with cutting teeth and notches at opposite ends thereof, a substantially U-shaped frame having a first pair of legs thereof removably connected to said housing, a second pair of legs on said frame insertable in the notches of said cutting plate, said frame being rigidly connected to said fixed cutting plate, the body of said frame being located between said fixed and movable cutting plates, and the longitudinal edges of said fixed plate constituting guides for said movable cutting plate.

3. A cutting head for a dry shaver as claimed in claim 2 further comprising recesses and abutment stops in said frame, said outer pair of legs on said U-shaped frame resiliently engaging the abutment stops in said recesses in the housing.

4. A cutting head for a dry shaver as claimed in claim 1 wherein said second pair of legs are each provided with an enlarged head portion which overlaps the notches of said cutting plate.

5. A cutting head for a dry shaver having a reciprocating driving means comprising a housing, a fixed cutting plate, a movable cutting plate provided with cutting teeth, and notches at opposite ends thereof, a substantially U-shaped frame having a first pair of legs thereof removably connected to said housing, a second pair of legs on said frame insertable in the notches of said cutting plate, said frame being rigidly connected to said fixed cutting plate, the body of said frame being located between said fixed and movable cutting plates, and the longitudinal edges of said fixed plate constituting guides for said movable cutting plate, said frame having recesses therein and abutment stops in said recesses, said first pair of legs each having a rib at the free end thereof projecting inwardly, said ribs being inserted first into said recesses and resiliently engaged with said abutment stops when said cutting head is placed in said housing.

6. A cutting head for a dry shaver as claimed in claim 1 wherein said frame is a metal plate which extends over the greater part of the width of said fixed cutting plate.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,144,714

August 18, 1964

Louw Arjen Biesma

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the grant, line 1, and in the heading to the printed specification, line 3, for "Louw Arjen Beisma", each occurrence, read -- Louw Arjen Biesma --; on the sheet of drawing, line 1, for L. A. BEISMA" read -- L. A. BIESMA --; on the lower right-hand corner of the drawing for "LOUW A. BEISMA" read -- LOUW A. BIESMA --.

Signed and sealed this 12th day of January 1965.

(SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents