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H. KONRAD

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RAZOR AND COMB

Original Filed Jan. 20, 1945

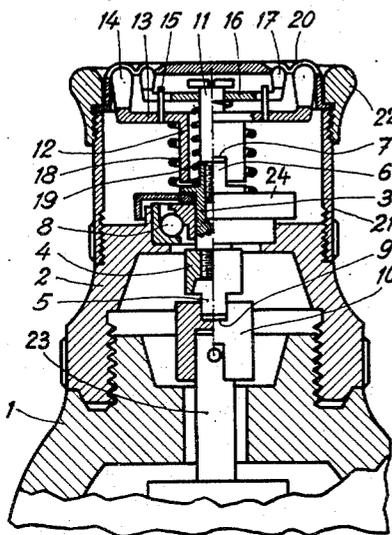


Fig. 1

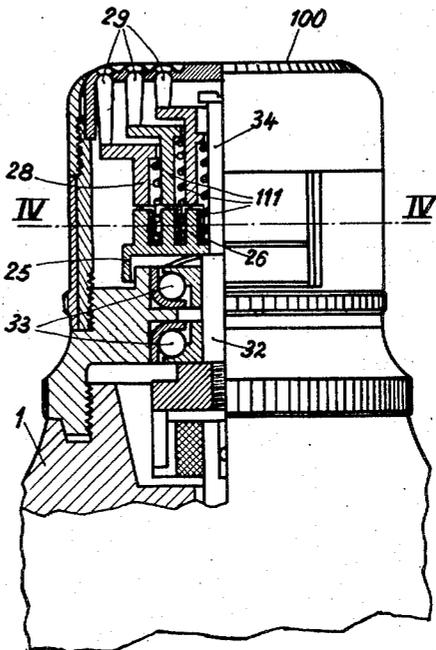


Fig. 3

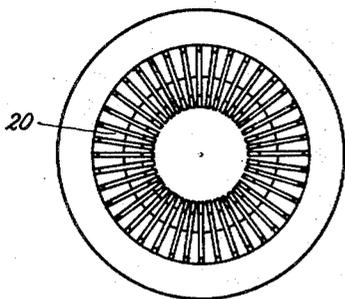


Fig. 2

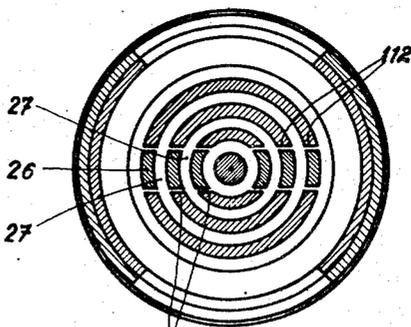


Fig. 4

INVENTOR
HERMANN KONRAD
By: Young, Emery & Thompson
ATTYS-

UNITED STATES PATENT OFFICE

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RAZOR AND COMB

Hermann Konrad, Moutier, Switzerland, assignor to Hermann Konrad, Soc. An., Moutier, Canton of Bern, Switzerland, a joint-stock company of Switzerland

Original application January 20, 1945, Serial No. 573,703. Divided and this application October 15, 1946, Serial No. 703,330. In Switzerland March 8, 1944

11 Claims. (Cl. 30—43)

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This invention relates to razors with several knives rotating under a comb. The razor according to the invention is characterized in that the different knives cooperate with different coaxial zones of the comb.

In a preferred embodiment the knives are pressed by individual springs against the inner side of the comb.

The accompanying drawings illustrate, by way of example, two embodiments of the razor according to the invention.

Fig. 1 is a section of the first example, through the axis of rotation of the knives.

Fig. 2 is a top view to Fig. 1.

Fig. 3 is an elevation of the second example, partly in section, and

Fig. 4 is a section along line IV—IV in Fig. 3.

In the embodiments shown in the drawing, the head of the razor is formed by a comb under which several knives with rows of blades arranged on concentric plates, rotate. Each of these rows makes contact with an individual zone of the comb of the razor, the different zones being coaxial to one another.

In Fig. 1 the rotatable knives are driven by a non-represented motor. To the end of the handle 1 containing the motor a bearing support 2 is screwed, supporting a threaded coupling rod 3. This rod, at the one end, carries a nut 4 with a projection 5, and, at the other end, a projection 6 entering a groove 7 provided on the bottom of the drive carrying the knives. The rod 3 rotates in a ball bearing 8 mounted on the support 2. The projection 5 of the nut 4 enters a groove 9 of a coupling sleeve 10 taken along by the axle 23 of the non-illustrated motor.

The device carrying the knives, at the bottom of which the groove 7 is provided, is held coaxially to the coupling rod 3 by a shouldered screw 11, and is composed of a sleeve 12 ending in a plate 13 on which eight blades 14 and two pins 15 are arranged, these pins 15 driving a plate 16 of smaller diameter, lying above plate 13 and having four blades 17. The plates 13 and 16 are permanently under the effect of individual springs 18 and 19 respectively, tending to press the blades 14 and 17 against the comb 29. The different knives are thus axially yieldable independent of one another. The comb is round and fixed to a sleeve 21 by means of a ring 22. This sleeve and this ring form together with the comb a protective cap inside of which the hairs cut off are collected. A cover 24 prevents the hairs from penetrating into the motor.

The friction between the blades of the knives

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and the comb teeth keeps the cutting edges always perfectly sharp.

In the embodiment shown in Figs. 3 and 4 the handle 1 likewise contains a non-represented motor. Its axle 32 is supported on ball bearings 33 and is prolonged by a long screw 34 fixed to the end of the axle. On a square part of the screw 34 a drive member in the form of a cap 25 is held, the edges of which cover the bearings. This drive member 25 carries tongues 26 leaving channels 27 between them the purpose of which is described later on. The sleeves 28 forming part of the rotatable knives 29, the blades of which cooperating with the comb 100 for cutting off the hairs, ride on the member 25.

The sleeves 28 are coaxial and fitted into one another with a certain play allowing them to slide with regard to one another. Helical springs 111 lie between these sleeves and penetrate into the channels 27 of the member 25. The different knives are thus coaxially yieldable independent of one another.

The coupling of these sleeves 28 and the member 25 is obtained by means of notches 112 shown in Fig. 4 into which the tongues 26 penetrate.

The head of the screw 34 serves as safety means on disassembling, for upon removal of the comb, the screw 34 will abut the flange portion of the sleeve 28 of the inner knife 29 and the remaining knives 29 will be retained in position by abutting this inner knife and each other in turn.

Owing to the fact that the knives are axially yieldable independent of one another, disturbance putting one of the knives out of action has no influence whatever upon the work of the others. Each knife works in an individual zone of the comb concentric to the zone of the adjacent knife. Now when by any reason one of the knives is put out of action, the cutting work on the other zones is in no way impeded thereby.

This application is a division of application Serial No. 573,703, filed January 20, 1945, now abandoned.

What I claim is:

1. In a razor, a body comprising a head portion having a comb plate forming the outer end face of said head portion, said comb plate comprising a plurality of slit annular raceways coaxial to and surrounding one another, a drive means mounted on said body, a cutter for each raceway coupled with said drive means to be rotated around an axis coinciding with the common axis of said annular raceways, said cutters being mounted so as to be axially yieldable independent of one another, each cutter having

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blades engaging one of said raceways, and springs each supported on said drive means and on one of said cutters to yieldably press the blades of said cutters into said annular raceways.

2. In a razor, a body comprising a head portion having a comb plate forming the outer end face of said head portion, said comb plate comprising a plurality of slit annular raceways coaxial to and surrounding one another, a drive means mounted on said body, a cutter for each raceway coupled with said drive means to be rotated around an axis coinciding with the common axis of said annular raceways, said cutters being mounted so as to be axially yieldable independent of one another, each cutter having a plate substantially perpendicular to the common axis of said annular raceways, and blades engaging one of said raceways and being fixed to and projecting axially from said plate, the plates of adjacent cutters being at an axial distance from one another, and springs each supported on said drive means and on one of said cutters to yieldably press the blades of said cutters into said annular raceways.

3. In a razor, a body comprising a head portion having a comb plate forming the outer end face of said head portion, said comb plate comprising a plurality of slit annular raceways coaxial to and surrounding one another, a drive means mounted on said body, a cutter for each raceway coupled with said drive means to be rotated around an axis coinciding with the common axis of said annular raceways, said cutters being mounted so as to be axially yieldable independent of one another, each cutter having a plate substantially perpendicular to the common axis of said annular raceways, and blades engaging one of said raceways and being fixed to and projecting axially from said plate, the plates of adjacent cutters being at an axial distance from one another, springs each supported on said drive means and on one of said cutters to yieldably press the blades of said cutters into said annular raceways, and a stop on said drive means to limit axial displacement of said plates caused by said springs on said comb plate being removed.

4. In a razor, a body, a cylindrical head piece fixed to said body, a ring fastened to said head piece, a comb plate arranged at the outer end face of said head piece and fixed to the latter by means of said ring, said comb plate comprising a plurality of slit annular raceways coaxial to and surrounding one another, a drive means mounted on said body, a cutter for each raceway coupled with said drive means to be rotated around an axis coinciding with the common axis of said annular raceways, said cutters being mounted so as to be axially yieldable independent of one another, each cutter having blades engaging one of said raceways, and springs each supported on said drive means and on one of said cutters to yieldably press the blades of said cutters into said annular raceways.

5. In a razor, a body, a cylindrical head piece fixed to said body, a ring fastened to said head piece, a comb plate arranged at the outer end face of said head piece and detachably fixed to the latter by means of said ring, said comb plate comprising a plurality of slit annular raceways coaxial to and surrounding one another, a drive means mounted on said body, a cutter for each raceway coupled with said drive means to be rotated around an axis coinciding with the common axis of said annular raceways, said cutters be-

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ing mounted so as to be axially yieldable independent of one another, each cutter having a plate substantially perpendicular to the common axis of said annular raceways, and blades engaging one of said raceways and being fixed to and projecting axially from said plate, the plates of adjacent cutters being at an axial distance from one another, and springs each supported on said drive means and on one of said cutters to yieldably press the blades of said cutters into said annular raceways.

6. In a razor, a body comprising a head portion having a comb plate forming the outer end face of said head portion, said comb plate comprising a plurality of slit annular raceways coaxial to and surrounding one another, a cutter for each raceway, mounted so as to be axially yieldable independent of one another, a drive means in engagement with one of said cutters and mounted on said body to be rotated around an axis coinciding with the common axis of said annular raceways, a means connecting the cutter engaging said drive means with the adjacent cutter to rotate the latter, each cutter having blades engaging one of said raceways, and springs each supported on said drive means and on one of said cutters to yieldably press the blades of the cutters into said annular raceways.

7. In a razor, a body comprising a head portion having a comb plate forming the outer end face of said head portion, said comb plate comprising a plurality of slit annular raceways coaxial to and surrounding one another, a cutter for each raceway mounted so as to be axially yieldable independent of one another, each cutter having a plate substantially perpendicular to the common axis of said annular raceways, and blades engaging one of said raceways and being fixed to and projecting axially from said plate, the plates of adjacent cutters being at an axial distance from one another, a drive means mounted on said body and in engagement with one of said cutters to be rotated around an axis coinciding with the common axis of said annular raceways, a pin connecting the plate of the cutter engaging said drive means with the plate of the adjacent cutter to rotate the latter, springs each supported on said drive means and on one of said cutters to yieldably press the blades of said cutters into said annular raceways, and a stop on said drive means to limit axial displacement of said plates caused by said springs on said comb plate being removed.

8. In a razor, a body comprising a head portion having a comb plate forming the outer end face of said head portion, said comb plate comprising a plurality of slit annular raceways coaxial to and surrounding one another, a drive means mounted on said body, a cutter for each raceway comprising sleeves having flanges and cylindrical parts coaxial to one another and coupled with said drive means to be rotated around an axis coinciding with the common axis of said annular raceways, said sleeves being mounted so as to be axially yieldable independent of one another, each cutter having blades carried by said flanges and in engagement with one of said raceways, and springs each supported on said drive means and on one of said sleeves to yieldably press the blades of said cutters into said annular raceways.

9. In a razor, a body comprising a head portion having a comb plate forming the outer end face of said head portion, said comb plate comprising a plurality of slit annular raceways co-

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axial to and surrounding one another, a drive means mounted on said body, a cutter for each raceway, comprising sleeves having flanges and cylindrical parts coaxial to one another and in engagement with said drive means to be rotated around an axis coinciding with the common axis of said annular raceways, said sleeves being mounted so as to be axially yieldable independent of one another, said flanges being substantially perpendicular to the common axis of said annular raceways, each cutter having blades engaging one of said raceways and being fixed to and projecting axially from the flange, the flanges of adjacent cutters being at an axial distance from one another, and helical springs within said cylindrical parts, each supported on said drive means and on the flange of one of said cutters to yieldably press the blades of said cutters into said annular raceways.

10. In a razor, a comb plate comprising a plurality of annular raceways coaxial to one another, a plurality of cutters inside said comb plate, comprising sleeves including flanges and hollow cylindrical parts coaxial to one another and having coupling means, and blades carried by said flanges, in cooperating contact with said raceways, separate springs within said cylindrical parts yieldably pressing the blades of the cutters against said comb plate independent of one an-

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other, and a common drive means engaging said coupling means to drive said sleeves.

11. In a razor, a comb plate comprising several annular raceways coaxial to one another, several cutters inside said comb plate, comprising sleeves including flanges and hollow cylindrical parts coaxial to one another and having notches, and blades carried by said flanges, in cooperating contact with said raceways, separate springs within said cylindrical parts yieldably pressing the blades of the cutters against said comb plate independent of one another, and a common drive means comprising tongues entering said notches, adjacent tongues forming channels the bottom of which abutting the one end and said sleeves the other end of said separate springs.

HERMANN KONRAD.

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