Dec. 2, 1952 J. P. RASMUSSEN 2,619,720

SAFETY RAZOR

Filed Aug. 2, 1950

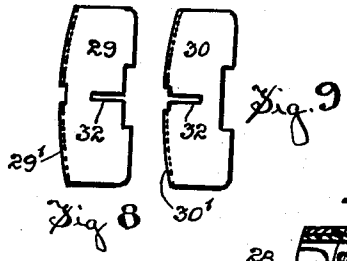


Fig. 8

Fig. 9

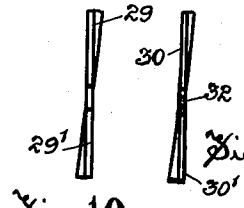


Fig. 10

Fig. 11

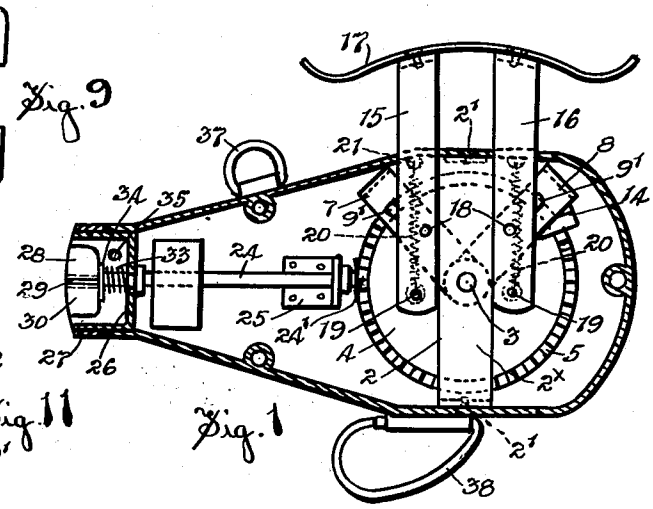


Fig. 1

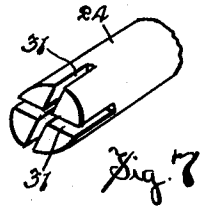


Fig. 7

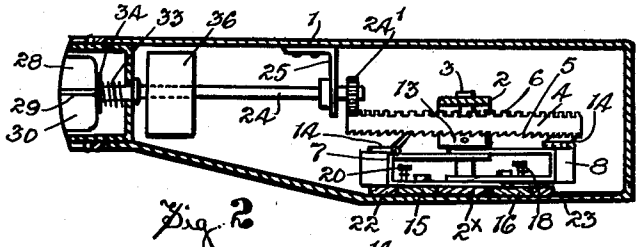


Fig. 2

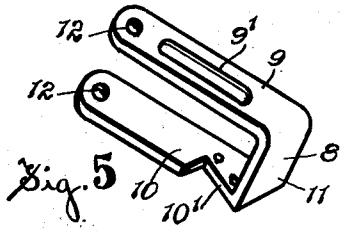


Fig. 5

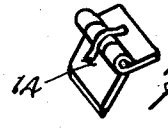


Fig. 6

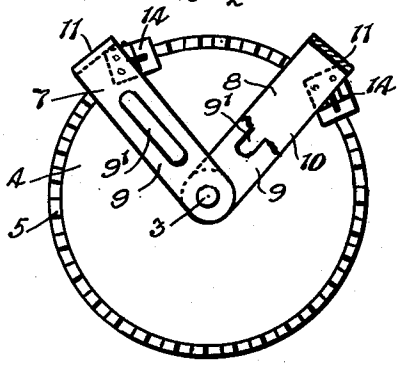


Fig. 3

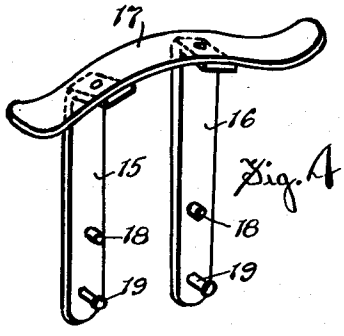


Fig. 4

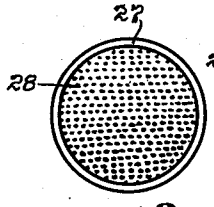


Fig. 12

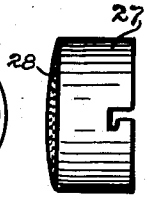


Fig. 13

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SAFETY RAZOR

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Application August 2, 1950, Serial No. 177,161

1 Claim. (Cl. 30—43)

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The invention relates to safety razors having blades of the rotary type and an object of the invention is to provide a safety razor actuated entirely by hand manipulation and wherein the blade operating mechanism is such that the blades rotate continuously when the device is in use.

A further object is to provide a blade operating mechanism of relatively few parts which can be easily and quickly assembled in their containing casing and which mechanism embodies an exterior finger piece or bar for exterior operation and suitable finger and thumb grips attached to the casing.

A further object is to provide a driving wheel for rotating the blades and which is supplied at one side with ratchet teeth and at the other side with gear teeth and to supply means associated with the ratchet teeth for continuously rotating the wheel in a clockwise direction in the depression of the finger bar and subsequent to the release thereof and means actuated by the gear teeth for rotating the blades.

A further object is to supply a fly wheel on the shaft which carries the blades and to construct the forward end of the shaft so that the blades can be easily and effectively mounted thereon and held pressed against the customary perforated, face engaging head.

A further object is to shape the blades so that they function also as a suction fan and to provide an air outlet for the fan in the casing.

With the above more important objects in view the invention consists essentially in the arrangements and construction of parts hereinafter described, reference being had to the accompanying drawing in which:

Fig. 1 is a face view of the interior parts, the front wall of the casing having been removed.

Fig. 2 is a plan view of the interior parts, the upper part of the casing having been removed.

Fig. 3 is an enlarged detailed side view of the wheel and showing the dog carrying arms.

Fig. 4 is a perspective view of the finger bar and the vertical bars secured thereto.

Fig. 5 is an enlarged detailed perspective view of one of the pawl or dog carrying members.

Fig. 6 is a perspective view of one of the pawls or dogs.

Fig. 7 is an enlarged perspective view of the front end of the countershaft, which carries the blades.

Fig. 8 and Fig. 9 are side views of the blades employed.

Figs. 10 and 11 are edge views of the blades.

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Figs. 12 and 13 are front and side views, respectively, of the front, perforated head in which the blades operate.

In the drawings like characters of reference indicate corresponding parts in the several figures.

The casing 1 can be made from any desired material of a shape to contain and support the working parts and of a size to form a convenient grip for the hand.

Within the casing I mount a substantially rectangular, upstanding frame 2 which can be firmly secured in place by suitable screws 2' screwing into the casing. This frame supports rotatably a drive shaft 3 to which I fixedly secure a wheel 4 having ratchet teeth 5 formed at the front side and gear teeth 6 formed at the rear side.

In front of the wheel and on the shaft I mount rotatably similar right and left dog or pawl carrying members 7 and 8 both of which are identically constructed and appear as best shown in Fig. 5 where it will be seen that each member comprises opposing, spaced side arms 9 and 10 having their outer ends interconnected as indicated at 11 and their inner ends provided with holes or bearings 12 to receive the drive shaft. When the said members are placed on the shaft they are spaced from the wheel by an intervening sleeve 13 and each member has the side arm 10 next the wheel provided at its outer end with a spring pressed pawl or dog 14 for engagement with the ratchet teeth of the wheel. In Fig. 6 I have shown a hinge which has one wing forming the dog and the other wing of which is adapted to be riveted to the side arm next the wheel. It will be observed, see Fig. 5, that the said arm 10 is notched away at 10' to permit the hinge to be positioned such that the dog crosses the ratchet teeth at right angles and it will also be noticed that the dogs are initially positioned (see Fig. 3) that they are at opposite sides of a vertical line passing through the drive shaft, and are arranged such that in the down movement of the members 7 and 8 the right hand dog drives the wheel while the left hand dog escapes past the teeth thereof, and that in the up movement of the said members the action of the dogs is reversed, the left hand dog driving while the other dog escapes over the teeth.

The arms 9 of the members are each supplied with a lengthwise extending slot 9' for a purpose shortly apparent.

While I have shown hinges as providing the spring pressed dogs it will be understood that any arrangement, which will operate for the purpose, can be used.

At opposite sides of the near upright part 2x of the frame 2, I locate a pair of sliding bars 15 and 16 which extend upwardly through suitable slots provided in the casing and have their upper ends secured permanently to a flat lying finger bar 17. The bars 15 and 16 are each provided with a pin 18 which pins are adapted to enter and move within the slots 9' of the arms 9. Further pins 19 are located at the lower ends of the bars 15 and 16.

Similar, vertically extending, coiled tension springs 20 are supplied, such springs having their lower ends secured to the pins 19 and their upper ends suitably secured to the casing as indicated at 21 in Fig. 1. The springs pass upwardly between the side arms and in no way interfere with the pins 18 which are only long enough to pass through the slots 9'. It will be obvious that the springs will cause the pins to hold the members 7 and 8 in the up position as shown in Figs. 1 and 3 and their up movement can be limited by the engagement of the pins with the upper ends of the slots or the tips of the members 7 and 8 striking the top of the casing. Further it will be seen that a down movement of the bars 15 and 16 as occasioned by a down pressure on the finger bar, will swing the members 7 and 8 downwardly in opposite directions. In such down movements, the pawl of the right hand member will rotate the wheel in a clockwise direction while the pawl of the left hand member will escape over the ratchet teeth. Upon release of hand pressure on the finger bar, the springs come into action, and cause the left hand pawl to drive the wheel while the right hand pawl escapes past the ratchet teeth. Accordingly by depressing and releasing the finger bar, the wheel is rotated continuously in a clockwise direction.

The inner face of the casing is supplied with vertical guide bars 22 and 23 and the bars 15 and 16 are guided for vertical movement between the bars 22 and 23 and the intervening vertical portion 2x of the frame 2.

The continuous rotary movement of the wheel brought about by depressing and releasing the finger bar, is utilized to drive a countershaft 24 which carries the knife blades later described in detail. The rear end of the countershaft is rotatably supported by a suitable bracket 25 secured to the casing and the forward end of said countershaft is mounted in a socket like member 26 secured to the front end of the casing. A collar or ring 27 is removably mounted on the latter member and carries the usual perforated, concavo-convex shaped head 28 for engagement with the face of the user of the razor.

The blades 29 and 30 are mounted on the countershaft within the member 26. The forward end of the countershaft is cross slotted as shown at 31 in Fig. 7 and the slots receive the blades. It will be observed that each blade is supplied with a central slot 32 which allows the blades to be fitted together at right angles to one another and then slid into final position within the slots of the countershaft. The clipping edges 29' and 30' are shaped to conform to the inner concaved face of the head 28 which they engage, being continuously pressed forwardly by a coiled spring 33 inserted on the countershaft between the base of the socket member and a washer at the rear of the blades and which is indicated by the reference number 34.

The socket like member is supplied to the rear of the blades with an outlet hole 35 and the rear portions of the blades are bent (see Figs. 10 and 11) so that the revolving blades operate as a fan, drawing air in through the perforated head and expelling it through the hole. In this way most of the clippings are discharged out of the hole.

A fly wheel 36 is mounted on the countershaft for the usual purpose and the rear end of the countershaft has a gear 24' secured thereto, which meshes continuously with the teeth 6 of the wheel 4.

The top of the casing, in advance of the pressure bar, is provided with an eye 37 to receive the index finger of the hand and the under part of the casing is supplied with an elongated eye 38 to receive the base of the thumb and the whole arrangement is such that one can conveniently and securely grasp and hold the casing while the second, third and fourth fingers are applying pressure on and releasing the finger bar.

While I have entered into a detailed description of the various parts it will be understood that they could be materially modified without departing from the spirit of the invention as set forth in the accompanying claim.

What I claim as my invention is:

In a safety razor, a casing shaped for convenient hand gripping purposes, a socket like member mounted in the forward end of the casing, a transverse, open frame fixedly mounted within the casing, a transverse drive shaft rotatably carried by the frame, a wheel carried by the shaft having ratchet teeth provided on its one face and gear teeth on its other face, a finger bar exterior of the casing, spaced guide bars secured to the finger bar and extending into the casing in a location opposing the ratchet teeth, said bars being slidably guided by the casing for in and out movement, a pair of right and left upwardly diverging arms rotatably carried by the shaft and positioned between the guide bars and the wheel, said arms being provided with longitudinally extending slots, pins carried by the guide bars and slidable within the slots, spring pressed pawls carried by the outer ends of the arms and engaging the ratchet teeth, said pawls being so positioned that in the spreading of the arms one pawl drives the wheel as the other escapes past the ratchet teeth thereof, tension springs secured to the casing and to the guide bars and holding the finger bar normally away from the casing and the arms normally in an up position, a rotatably mounted countershaft having its forward end extending into the socket like member and its rear end provided with a gear wheel meshing with the gear teeth of the former wheel and blades mounted on the forward end of the countershaft and within the socket like member.

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