Oct. 11, 1938. J. H. RAND, JR., ET AL 2,132,644

DRY SHAVER MECHANISM

Filed July 2, 1937 2 Sheets-Sheet 1

Fig. 1

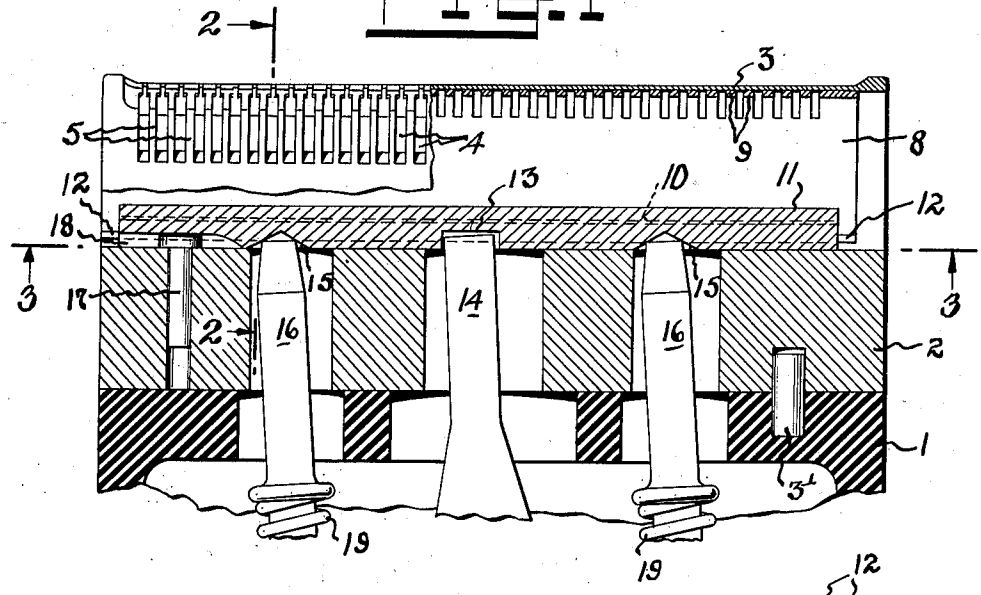


Fig. 2

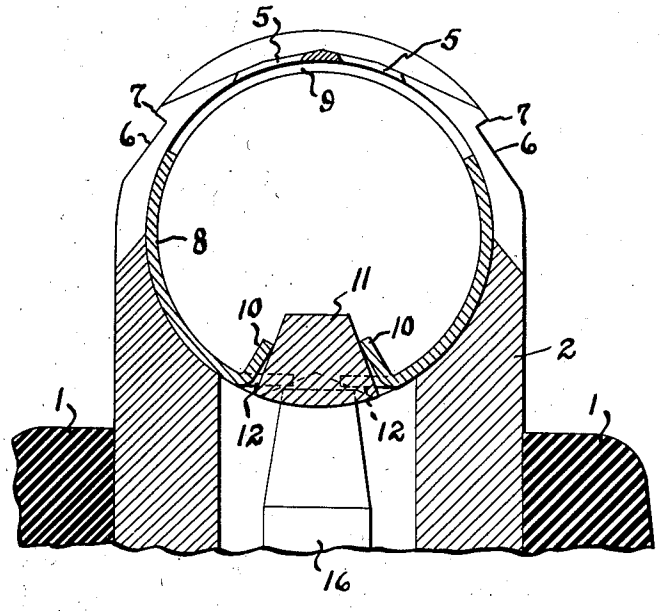
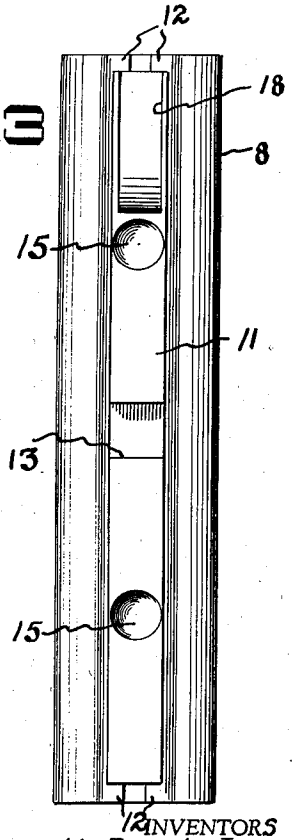


Fig. 3



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Fig. 4

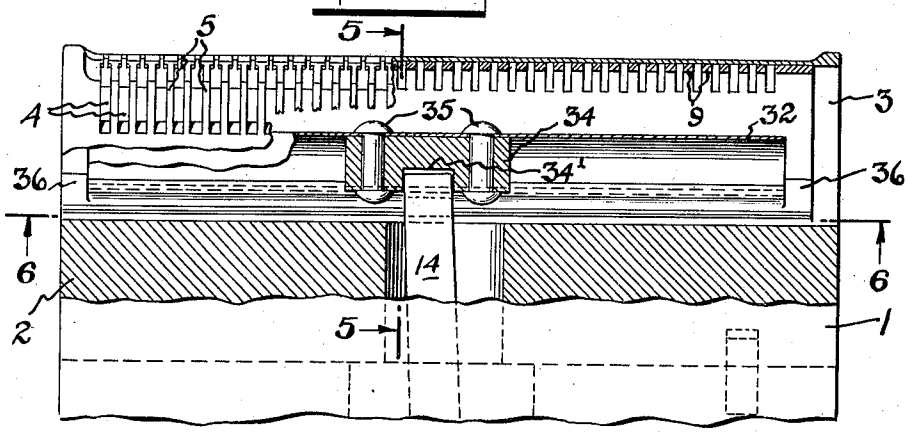


Fig. 6

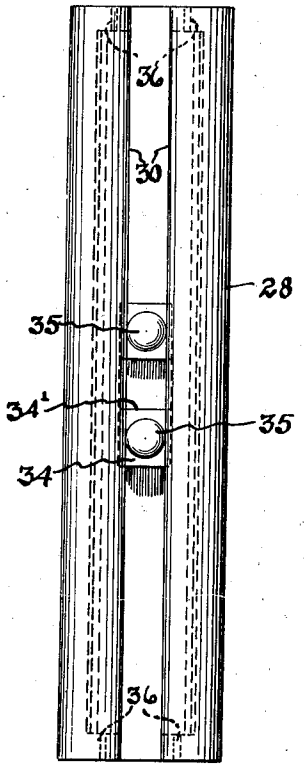
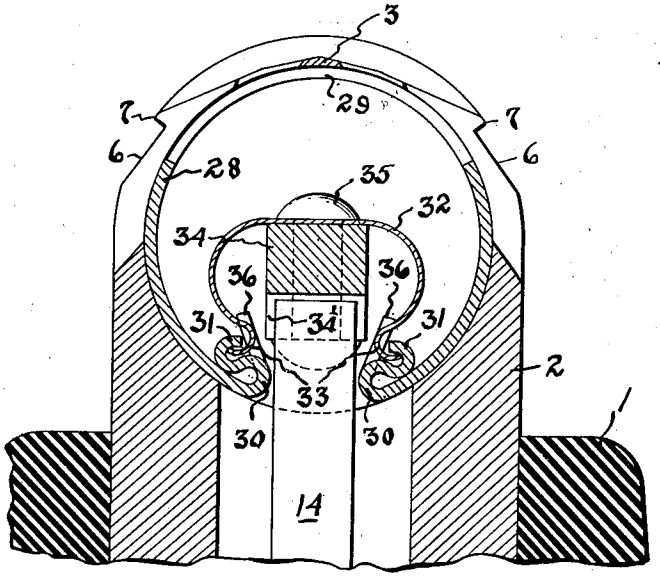


Fig. 5



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UNITED STATES PATENT OFFICE

2,132,644

DRY SHAVER MECHANISM

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Application July 2, 1937, Serial No. 151,651

13 Claims. (Cl. 30—43)

This invention relates to improvements in the shaving heads of dry shaving implements.

The general object of this invention is to provide a novel combination of an outer shearing plate and an inner reciprocal hollow expansible cutter held in cooperating contact therewith by means either in the form of a wedge or a spring.

A further object of this invention is to provide a wedge or spring means for expanding the hollow cutter which is longitudinally split for engagement with said means.

A further object of the invention is to provide a wedging or expanding means in such form that the motor operating mechanism may be connected thereto for effecting reciprocation of the cutter.

These and other objects as will appear from the following disclosure are secured by means of the invention herein.

This invention resides substantially in the combination, construction, arrangement and relative location of parts, all as will be described in greater detail in the following specification.

In the accompanying drawings,

Figure 1 is a cross-sectional view showing some parts in elevation of a dry shaver head constructed in accordance with this invention;

Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a view taken on the line 3—3 of Figure 1 with some parts omitted;

Figure 4 is a view similar to that of Figure 1 of a modified mechanism;

Figure 5 is a cross-sectional view taken on the line 5—5 of Figure 4; and

Figure 6 is a cross-sectional view taken on the line 6—6 of Figure 4 with some parts omitted.

As illustrated in the drawings, at 1 is a portion of the motor housing which is formed of any suitable material into such a shape as to provide a device which can be conveniently held in and manipulated by hand. The upper end of the housing is formed with a groove therein, as is apparent from Figure 2, in which the shaving head unit is locked, usually by means of a screw, not shown. The shaving head comprises an outer member comprising a block 2 of suitable steel having a longitudinal bore therethrough to form the wall 3 which is provided with two series of slots 4 extending in rows therealong on opposite sides of a central longitudinal line. The slots 4 form the cutter bars which may assume any suitable form and which by themselves form no part of this invention. As illustrated, the outer side faces of the thin wall 3 are cut away along the planes 6 to form the sharp corners 7 which provide a comb for engaging and guiding the hairs into the slots. Mounted within the bore of the outer member is the inner cutter which is shown in Figure 2 substantially in the form of a thin-walled cylinder 8 which is provided with a plurality of transverse slots which define the cutter bars 9 of the inner cutter. The cylindrical inner cutter 8 is preferably formed from a thin sheet of suitable steel into a cylinder which is longitudinally slit along one side thereof with the terminal edges 10 turned inwardly, as is clear from Figure 2, except at the very ends where tabs 12 are left which are only slightly inturned. The external diameter of the cylindrical inner cutter is substantially the same as the diameter of the bore in the outer member but is sufficiently small as to be readily insertable thereinto.

Lying between the inturned or flanged edges 10 is a wedge-shaped block 11 which is short enough so that it will just fit in between the lugs 12 to lock it against any relative longitudinal movement with respect to the inner cutter. The wedge member 11 in cross-section has a form, as is clear from Figure 2, with its side walls converging upwardly and proportioned so as to engage the inturned flanges 10. It is provided on its lower surface at about its longitudinal center with a recess or groove 13 positioned to be engaged by the lever 14 of the motor operated driving mechanism, with the result that the cutter and wedge member which are locked together are conjointly reciprocated. Disposed on opposite sides of the grooves 13 are the depressions 15 which are positioned to receive the ends of the plungers 16 which are urged upwardly by means of springs 19. These spring-pressed plungers act to force the wedge-shaped member 11 between the flanges 10, thereby expanding the cylindrical cutter 8 in the bore of the outer member to cause firm contact therebetween. This ensures the proper cooperating pressure between the outer and the inner cutter bars. At one end of the wedge-shaped member a longitudinal groove 18 is formed on its bottom face in a position to engage the head of a pin 17 mounted in the body portion 2 of the outer member. This pin, cooperating with the slot 18, acts to ensure rectilinear movement of the inner cutter. At 3' is shown a pin molded in the housing 1 and positioned to engage a recess in the body portion 2 to properly index the shaver head on the end of the housing.

A modified structure is illustrated in Figures 4 to 6, inclusive. The housing and outer member

are of substantially the same construction as that previously described. In this case the inner cutter 28, which is again a thin-walled, hollow, substantially cylindrical member, is provided with a longitudinal split along one side. The terminal edges at the split are sharply curved inwardly, as indicated at 30, and reversely curved outwardly, as indicated at 31, to form transversely curved channels running down the length thereof. At 32 is a channel-shaped spring member of open section, the terminal edges of which are curved outwardly, as indicated at 33, so as to engage with the curved ends 31 of the inner cutter. This spring member is so constructed that it must be compressed transversely in order to snap it into the grooves formed by the curved ends 31. It then acts in attempting to resume its normal shape to expand the hollow inner cutter 28 in the bore of the outer member to ensure engagement therebetween under pressure. It is noted that the longitudinal length of the spring member 32 is less than that of the cylindrical member 38 so that it lies between the tabs 36 at each end of the cylindrical member on each side of the split to prevent relative longitudinal movement between them. Secured by means of the rivets 35 at about the longitudinal center of the spring member 32 is a block 34 which is provided with a groove 34' on its bottom face positioned to be engaged by the operating lever 14.

In this construction it will be seen that the channel-shaped spring member 32 acts to expand the split inner cutter 28 in the opening of the outer shear plate so that its cutter bars 29 cooperate with the rear faces of the cutter bars of the outer shear plate under pressure. This member also provides means for connecting the inner cutter to the motor driving mechanism, thereby effecting several functions with a simplified construction.

It will be apparent to those skilled in the art that both forms of inner cutter illustrated are capable of being cut from sheets of suitable steel and readily formed up into the desired shapes by means of mass production methods, thereby greatly reducing the cost of manufacture.

Those skilled in the art will readily appreciate that the principles of the invention may be adapted in several physical forms without departure from the scope thereof. We do not, therefore, desire to be strictly limited to the disclosure as given for purpose of illustration but rather to the appended claims.

What we seek to secure by Letters Patent is:

1. A dry shaver, comprising an outer slotted shear plate formed to provide a housing, a longitudinal split tubular, transversely slotted cutter within the housing, a member for effecting reciprocation of the inner cutter, and means engaging the inner cutter at the split and engaged by said operating member for effecting connection therebetween and expanding the inner cutter against the inner wall of the housing.

2. A dry shaver, comprising an outer slotted shear plate formed to provide a cylindrical inner wall, an inner split tubular cutter having cutter bars formed thereon, a member for effecting reciprocation of the inner cutter, and means engaging the inner cutter at the split and engaging said operating member for effecting connection therebetween and expanding the inner cutter against said cylindrical inner wall, said means being in the form of a wedge-shaped bar lying between the edges of the split inner cutter.

3. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side, spring-pressed wedge means in said slot for expanding said cutter in the track, and an operating member connected to said wedge means.

4. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side, wedge means in said slot for expanding said cutter in the track, and an operating member connected to said wedge means, said inner cutter having tabs at the ends of the slots engaging the ends of said wedge means to hold the wedge member against relative movement with respect to the inner cutter.

5. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side, and means engaging the edges of the slot to expand the inner cutter in the cylindrical track.

6. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side, the edges defining the slot being inturned, means engaging the inturned edges to expand the inner cutter in the cylindrical track, and an operating member engaging said means for reciprocating the inner cutter.

7. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side and the edges of the slot inturned, and resilient means engaging the inturned edges to expand the inner cutter in the cylindrical track.

8. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side and the edges of the slot inturned, and resilient means engaging the inturned edges to expand the inner cutter in the cylindrical track, said resilient means comprising a channel-shaped member of spring material.

9. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side and the edges of the slot inturned, and resilient means engaging the inturned edges to expand the inner

cutter in the cylindrical track, said resilient means comprising a channel-shaped member of spring material, the terminal edges being outturned to engage the inturned edges of the inner cutter.

10. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side and the edges of the slot inturned, resilient means engaging the inturned edges to expand the inner cutter in the cylindrical track, said resilient means comprising a channel-shaped member of spring material, and an operating member connected to said means for reciprocating the inner cutter.

11. In a dry shaving device, the combination comprising an outer shear plate having cutter bars formed therein, said shear plate having a cylindrical track therethrough, an inner reciprocal cutter mounted in said track comprising a thin-walled cylinder having cutter bars formed thereon, said cylinder being slotted along one side and the edges of the slot inturned, resilient means engaging the inturned edges to expand the inner cutter in the cylindrical track, said resilient means comprising a channel-shaped member of spring material, the terminal edges being outturned to engage the inturned edges of the inner cutter, and an operating member connected to said means for reciprocating the inner cutter.

12. A dry shaver of the type described, comprising an outer member having a cylindrical bore forming a thin wall slotted to form cutter bars, an inner hollow cutter reciprocally mounted in said bore having cutter bars formed thereon, said inner cutter being slotted along an element, means engaging the inner cutter in said slot for expanding it, and means connected to said last means to effect reciprocation of the inner cutter.

13. A dry shaver of the type described, comprising an outer member having a cylindrical bore forming a thin wall slotted to form cutter bars, an inner hollow cutter reciprocally mounted in said bore having cutter bars formed thereon, said inner cutter being slotted along an element, resilient means engaging the inner cutter in said slot for expanding it, means connected to said last means to effect reciprocation of the inner cutter, said expanding means having a slot therein, and a pin mounted on said outer member and engaging said slot to ensure rectilinear reciprocation of the inner cutter.

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