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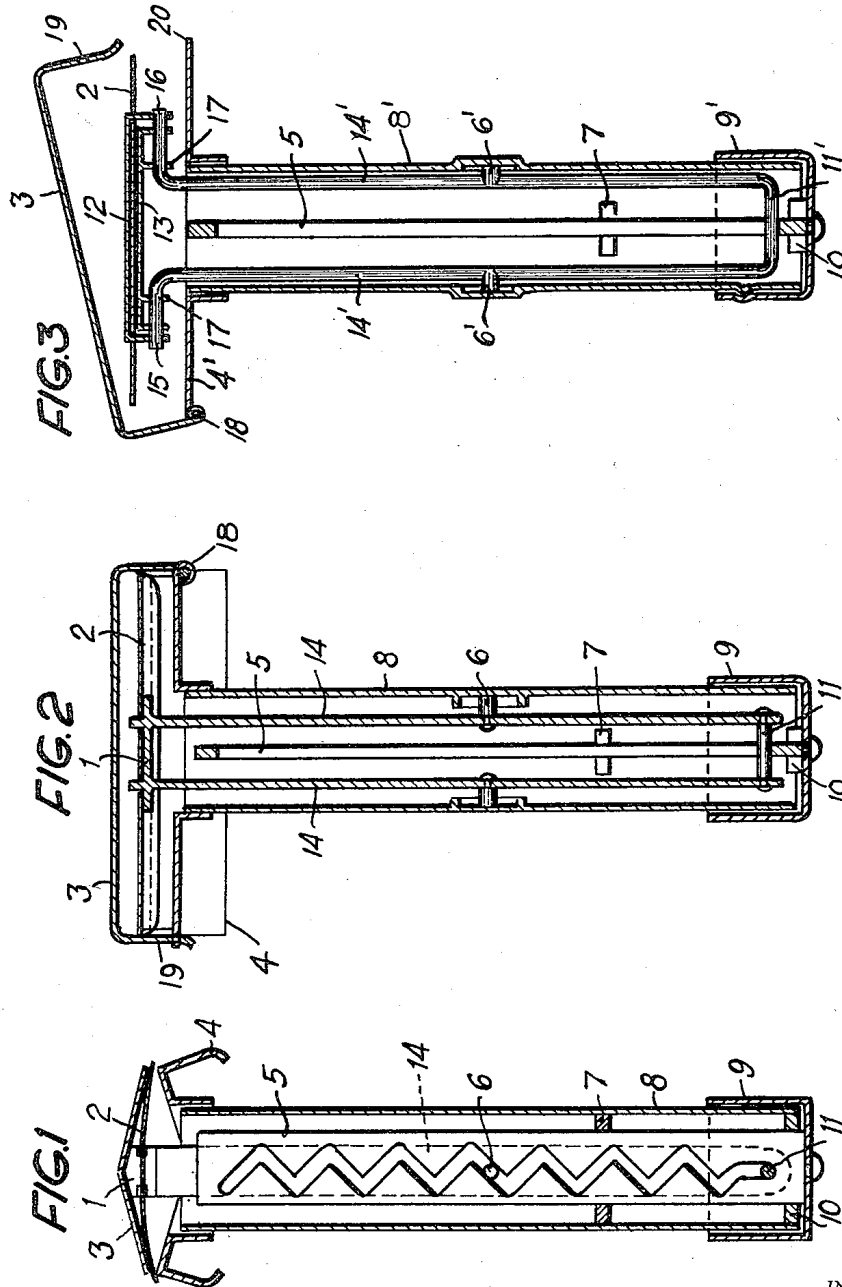
L. B. V. BRANGE ET AL

2,577,873

SHAVING APPARATUS

Filed June 21, 1949

2 SHEETS—SHEET 1



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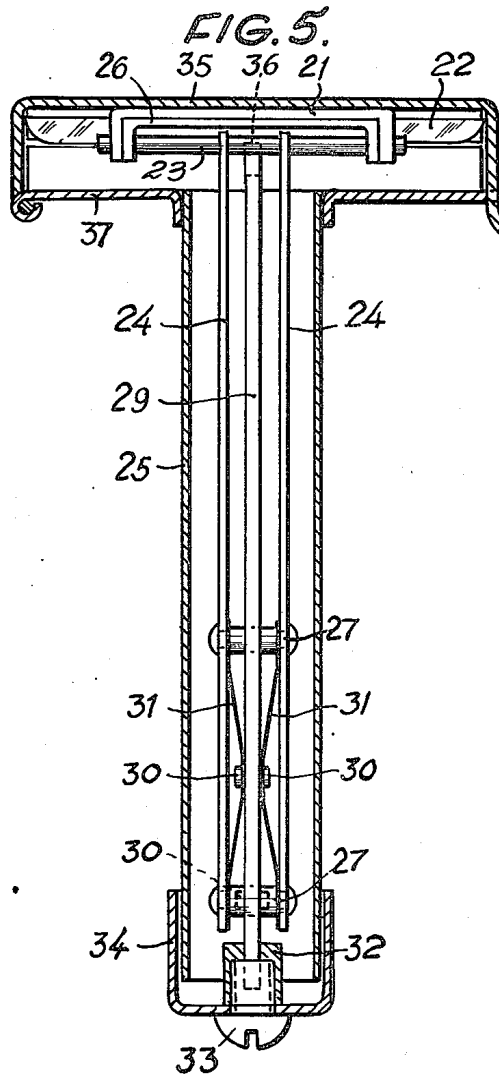
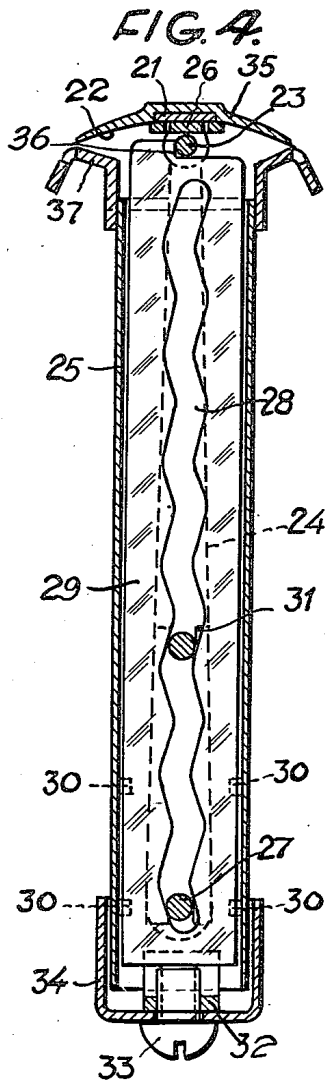
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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

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SHAVING APPARATUS

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9 Claims. (Cl. 30—36)

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The present invention relates to an arrangement in shaving apparatus, particularly so-called safety razors, comprising a lower guard and an upper guard mounted on a stem between which guards a razor blade is adapted to be secured. The invention relates more particularly to such safety razors in which the razor blade may be displaced relative to the upper and the lower guard for honing of the edge or edges of the blade. The object of the invention is to provide such a shaving apparatus as might be used as honing apparatus, in which the honing may be effected by means of very simple manipulations without the aid of special means, the whole apparatus being of a very simple and solid construction which may be produced at a cheap price by mass production methods.

The invention is substantially characterized by the fact that the razor blade is connected to a driving device for displacing the blade substantially in its own plane transversely of its longitudinal edges between the upper guard and the lower guard which are provided with smooth faces serving as honing faces for the razor blade during its displacement and as a support for the blade in its position for shaving uses.

Further features and improvements will be seen from the following description of some embodiments which are shown diagrammatically in the accompanying drawings.

Fig. 1 is a longitudinal section of a first embodiment of the invention in a plane at right angles to the longitudinal direction of the razor blade.

Fig. 2 is a longitudinal section of the first embodiment of the invention (shown in Fig. 1) in a plane running through the longitudinal central line of the razor blade.

Fig. 3 shows another embodiment in section in a plane running through the longitudinal central line of the razor blade.

Figs. 4 and 5 show in two planes perpendicular to each other longitudinal sections of a third embodiment of the safety razor according to the invention.

In Figs. 1 and 2, 3 denotes the upper guard of the safety razor and 4 its lower guard, between which guards the razor blade 2 is provided. The lower guard 4 is solidly attached to a hollow tube-like handle 8. The handle at its lower end is provided with a sleeve-like cover 9 which may be secured to the handle by locking means (not shown), such as a bayonet mount, screw thread or the like. A driving member 5 extends into the handle and the cover 9, and is connected rotat-

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ably thereto, the driving member, in the embodiment shown, consisting of a plate having a zig-zag-slot, said plate and cover being a unit free to reciprocate longitudinally within and relative to said handle when said cover is unlocked from the handle. The driving member 5, is guided during movement longitudinal of the handle, by means of transverse guide members 7 and 10. A holder 1 securing the razor blade in its centre is provided with two arms 14, one on either side of the driving member, said arms extending down into the handle. The arms 14 are pivotally and slidably secured to the interior of the handle 8 by means of the studs 6 on the arms extending into grooves or sockets in the inner surface of the handle. The arms, at their lower ends, are connected to each other by means of a pivot 11 passing through the guiding slot in the driving member 5.

The razor is shown in Fig. 1 with the various parts in their position for shaving, the driving member 5 being wholly inserted into the stem and the axially extending lower part of the slot keeping the pivot 11 in axial position and pressing the same upwards, so that the razor blade holder 1 is pressed against the upper guard 3 and thus held in central position with the razor blade in a suitably bent position for shaving purposes.

When honing, the cover 9 is released by turning it with respect to the handle 8, and the cover 9 serving as a finger grip is pulled out together with the driving member 5, the pivot 11 then running in the slot and imparting a reciprocal oscillation to the blade holder 1, while owing to the frictional resistance between the driving member and the pivot 11 and the arms 14, respectively, the blade holder is pulled down with the razor blade bearing on the lower guard 4, against the smooth surface of which the lower face of the razor blade edges are honed. When pushing the driving member back into the handle the holder is pressed upwards in the corresponding way, while the holder is simultaneously swung to and fro in a direction perpendicular to the razor blade edges during the honing of the upper face of said edges towards the smooth face of the upper guard.

Referring to Fig. 3 the razor blade holder comprises a yoke 12, the bent down ends of which pass through the holes in the razor blade 2 and are themselves provided with holes for two studs 15 and 16 running in parallel with the longitudinal direction of the razor blade, said studs being formed out of the bent out ends of the arms 14 which may preferably be made of stainless

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steel wire. The razor blade 2 is secured towards the inside of the yoke 12 by means of another yoke 13 which supports the lower face of the razor blade and with its bent-down ends is passed onto the studs 15 and 16. In order to guide the studs 15 and 16 into the position co-axially to each other and hold the blade holder in an approximately centered position on the studs the inner yoke 13 is provided with additional flaps 17 being passed through by studs 15 and 16. The upper guard of the head of the razor has the shape of a yoke with its one end being pivotally mounted about a shaft 18 on one end of the lower guard 4' and with its other end being provided with a recess 19 into which a projection 20 at the other end of the lower guard 4' may snap. The bent-down ends of the upper guard simultaneously serve as guiding means for the ends of the razor blade during its transversal movement. When exchanging razor blades the upper guard 3 is swung back, the driving member 5 is pulled out to withdraw it a short distance from between the arms 14' and then pushed in again to push the arms 14' upwardly and bring the studs 15 and 16 into position to be grasped by the fingers. The studs are then pressed towards each other to release the yoke 12 and the blade 2.

It has been proved that honing faces of the common type of stainless steel, i. e. the material of which the upper and lower guards are made, yield a fully satisfying honing effect. In this way it will be possible to make all parts of the safety razor of stainless steel either in the form of stamped or moulded plate parts or drawn tube portions and wires.

In the embodiment shown in Figs. 4 and 5 the razor blade holder also comprises an upper yoke 21, the bent-down ends of which extend through holes in the razor blade 22 and are provided with holes for a holding pin 23 being attached at the upper ends of two arms 24 extending down into the handle 25 of the safety razor. The razor blade is kept bearing on the inside of the upper yoke 21 by a lower yoke 26.

The arms 24 are at their lower ends and at some distance above the same connected with each other by means of two pins 27 which both extend through a corrugated or zigzag-slot 28 in the driving member 29. The driving member has nearly the same width as the handle and is guided by guide knobs 30 arranged at the inside of the handle for the edges of the driving member. Said knobs are provided at the lower end of the handle, so that, when pulled out, the guide does not release the knobs. The distance between the pins 27 is equal to an uneven number of times half a wave length of the zigzag-slot, in the example here demonstrated two and a half wave lengths. Between the arms 24 and the driving member 29 are placed bent springs 31, which are guided on the pins 27 by means of recesses provided in the ends of the springs and which maintain an even friction between the arms and the driving member. Said friction is of importance for the proper functioning of the device as will be clearly understood by the following description. At the lower end of the driving member 29 is attached a portion 32, into which is threaded a screw 33, around which the cover 34 serving as a finger grip and covering the lower end of the handle is rotatably mounted. The cover may be locked on the lower end of the handle by means of a bayonet mount (not shown), screw thread or the like, in this way maintaining the driving member 29 in an accurately determined center-

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ing position. In this wholly pushed-in position as shown in the drawing the upper end of the driving member 29 bears on the holding pin 23 and presses the razor blade holder against the upper covering guard 35 of the razor, the upper holder yoke 21 entering a channel stamped into said guard. In this upper position the pins 27 are disposed in the central line of the driving member, so that the arms take a centered position which in addition is secured by the engagement of the upper yoke 21 with the channel in the upper covering guard 35.

The driving member 29 is at its upper end also provided with a shoulder 36 forming a stop for the holding pin 23, as it pivots towards the central position when the driving member 29 is pushed in and locked by means of the cover 34. In this way a free introduction of the upper holding yoke 21 into the channel of the upper covering guard 35 is assured.

When displacing the driving member 29 in the handle 25 the pins 27 will move laterally in opposite directions owing to their distance with respect to the wave length of the zigzag-slot, a great swinging movement of the razor blade holder 21, 23, 26 being obtained with comparatively small bends in the zigzag-slot 28. It will in this way be subjected to the least possible wear, and the resistance to the displacement of the driving member will be more even and weaker.

The bearing pressure of the razor blade towards the honing faces is determined by the resistance to the movement of the driving member 29 with respect to the arms 24, and said resistance is greatly determined by the springs 31.

After screwing out the screw 33 and removing the cover 34 and the upper guard 35, the whole device comprising the parts 21, 22, 23, 24, 26, 29, 31, and 32 may be pulled out of the handle 25 for cleaning, if desired, without any members co-operating with the handle 25, such as the pivots for the arms 24 preventing this.

What we claim is:

1. In a shaving apparatus comprising a lower guard and an upper guard arranged on a tubular handle and having a razor blade secured between them, a holder supporting the razor blade, an extension of said holder extending into said tubular handle, a driving member reciprocally movable in the longitudinal direction of the handle, a corrugated guiding face on said driving member and means on said extension of said holder adapted for cooperation with said corrugated face of said driving member for reciprocating displacement of said holder and of the razor blade supported by said holder in a direction transverse to the cutting edges of the razor blade relative to the upper and lower guards when said driving member is displaced within said handle for honing the razor blade edges against said upper and lower guards.

2. In a shaving apparatus comprising a lower guard and an upper guard arranged on a tubular handle and having a razor blade secured between them, a holder supporting the razor blade, an extension of said holder extending into the tubular handle, a driving member longitudinally displaceably within the handle, a corrugated guiding face on said driving member and means on said extension of said holder adapted for cooperation with said corrugated face of said driving member for reciprocating displacement of said holder and the razor blade in a direction transverse to the cutting edges of the blade when said driving member is displaced within said handle,

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a finger grip on the end of the driving member most remote from the razor blade, said grip being shaped to form a cover for the free end of the handle in the pushed in position of the driving member, in which position the driving member and the extension of the holder are so positioned relatively to each other, that the holder and the razor blade are maintained in a centered position for shaving.

3. In a shaving apparatus as claimed in claim 2, a stop member projecting from the end of the driving member facing the razor-blade holder and adapted for engagement with said holder in the pushed in position of the driving member for stopping said holder in the centered position.

4. In a shaving apparatus comprising a lower guard and an upper guard arranged on a tubular handle and having a razor blade secured between them, a holder supporting the razor blade, two arms extending from said holder into the tubular handle, a flat bar longitudinally displaceably guided within the tubular handle between said arms, a corrugated slot in said flat bar, a pin connecting said arms near their free ends and extending through said slot, two coaxial pivots extending outwardly from either arm between said pin and said holder and being journaled in the tubular handle, said pin and said pivots being parallel with the cutting edges of the razor blade, a finger grip pivotally mounted on the end of the flat bar most remote from the blade, a straight end portion of the slot extending along the middle axis of the flat bar near said end thereof, said grip being shaped to form a cover for the free end of the handle in the pushed in position of the flat bar, means on said grip and on the free end of the handle for locking said grip on said handle in the pushed in position of the flat bar, in which position the pin extending through the slot extends through the straight portion thereof.

5. In a shaving apparatus comprising a lower guard and an upper guard arranged on a tubular handle and having a razor blade secured between them, a holder detachably supporting the razor blade, an extension of said holder extending into the tubular handle, a driving member reciprocally movable in the longitudinal direction of the handle, a corrugated guiding surface on said driving member, means on said extension engaging the corrugated surface for reciprocating displacement of the holder and razor blade transverse of the cutting edges of said blade relative to the upper and the lower guards when the driving member is displaced longitudinally within the handle, flaps extending from the ends of the upper guard towards the ends of the lower guards, one of said flaps being pivotally connected to said lower guard and the other of said flaps having locking means capable of engaging corresponding locking means on the lower guard, said flaps extending past the ends of the razor blade and forming guiding surfaces for the blade ends during the reciprocating displacement thereof.

6. In a shaving apparatus comprising a lower guard and an upper guard arranged on a tubular handle and having a razor blade secured be-

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tween them, a holder supporting the razor blade and comprising two U-shaped bent strips, fitted into each other and having their bent ends journaled on supporting pins extending parallel to the longitudinal direction of the blade, the ends of the outer strip extending through holes in the razor blade, said supporting pins being rigidly connected with arms extending into the tubular handle, a driving member reciprocally movable in the longitudinal direction of the handle, a corrugated guiding surface on said driving member, means on said arms engaging the corrugated surface for reciprocating displacement of the holder and razor blade transversally of the cutting edges of said blade relative to the upper and the lower guards when the driving member is displaced longitudinally within the handle.

7. In a shaving apparatus as claimed in claim 6, in which the supporting pins of the razor blade holder, the arms extending into the tubular handle and the means engaging the corrugated surface are formed by a metal wire bent to the form of an elongated U having the ends of its legs bent outwardly to form the supporting pins of the razor-blade support, the legs of the U proper forming the arms extending into the handle and the transverse middle portion of the U forming a guiding pin engaging the corrugated surface of the driving member.

8. In a shaving apparatus comprising a lower guard and an upper guard arranged on a tubular handle and having a razor blade secured between them, a holder supporting the razor blade, two arms extending from said holder into the tubular handle, a flat bar longitudinally displaceably guided within the tubular handle between said arms, a corrugated slot in said flat bar, two pins connecting said arms rigidly together, one near their free ends and one between said free ends and the razor blade holder, said two pins extending through said slot at a distance from each other substantially equal to an uneven number of times half the wave length of the corrugated slot, said pins being parallel with the cutting edges of the razor blade, a finger grip pivotally mounted on the end of the flat bar most remote from the razor blade, said grip being shaped to form a cover for the free end of the tubular handle in the pushed in position of the flat bar, means on said grip and on the free end of the handle for locking said grip on said handle in the pushed in position of the flat bar, in which position the two pins engage the corrugated slot at points thereof, which are situated in the geometrical axis of the handle.

9. In a shaving apparatus as claimed in claim 8, resilient means engaging smooth portions of the bars and of the flat bar to maintain an even frictional resistance against the displacement of the arms and the flat bar relatively to each other.

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No references cited.