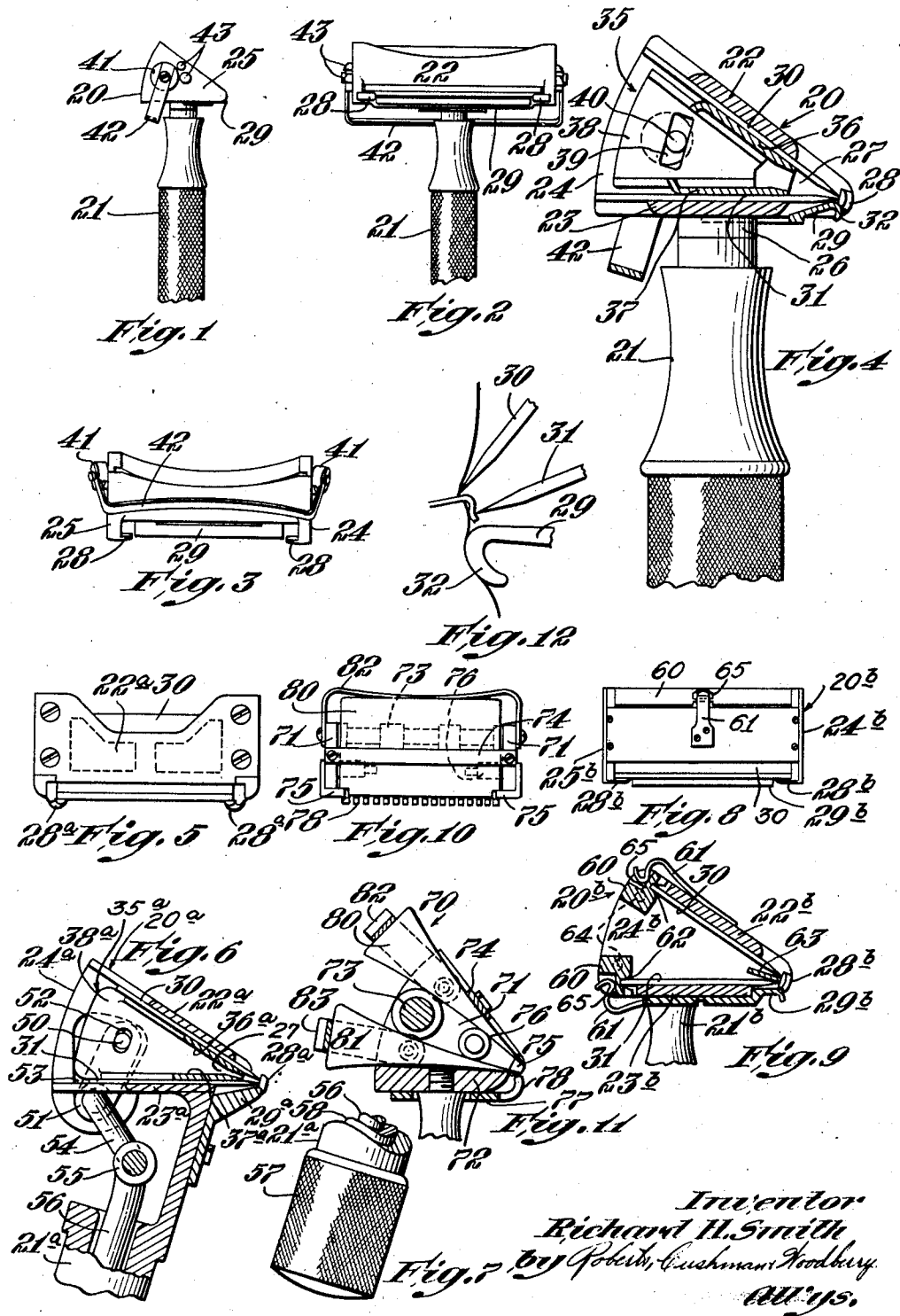


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SAFETY RAZOR

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Fig. 7 by Robert Cushman Woodbury
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SAFETY RAZOR

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This invention relates to an improvement in safety razors and more particularly in razors of the type set forth in my Patent No. 1,579,844 dated April 6, 1926, wherein two blades are mounted in the head.

The primary object of this invention is to provide in a razor of that type means which facilitate the easy and accurate positioning of the blades relative to each other and to the guard, such means including rigidly mounted fingers against which the forward edges of the blades, or accurate recesses in them, rest. A further object of this invention is to include in such assembling means elements which coact with similar portions of the blades in order to advance the blades against such fingers and to lock them securely in the operating position. Another object of this invention is to provide in such a razor a wedge-shaped element by which the blades are separated a predetermined distance, are advanced into contact with the fingers and are clamped in such position.

These and other objects of the invention will appear from a consideration of the following description and of the accompanying drawing which form a part thereof and in which

Fig. 1 is a view in side elevation of the head of a safety razor illustrating one embodiment of this invention;

Figs. 2 and 3 are front and plan views of the embodiment shown in Fig. 1;

Fig. 4 is an enlarged transverse cross-sectional view of such embodiment;

Fig. 5 is a plan view of another embodiment of this invention;

Figs. 6 and 7 illustrate such embodiment in side elevation, the head being shown in cross section;

Figs. 8 and 9 are plan and head cross-sectional views of another embodiment of the invention;

Figs. 10 and 11 are views similar to Figs. 8 and 9 of still another embodiment of the invention; and

Fig. 12 is an enlarged diagrammatic view illustrating the parts played by elements of the razor in severing the stubble or whiskers.

The preferred embodiment shown in Figs. 1 to 4 inclusive comprises a head 20 and a handle 21. The head 20 comprises upper and lower walls 22 and 23 and end walls 24 and 25. As illustrated, these walls are rigidly joined to form the frame of the head, or, if desired, the frame is integral in construction. The head is provided with a stud 26 to which the handle 21 is secured in any desired well-known manner as by coacting screw

threads (not shown). The upper and lower walls 22 and 23 converge toward each other at the face of the razor but do not come into contact leaving a mouth or opening 27. The end walls 24 and 25 extend beyond the upper and lower walls and carry fingers 28 which project toward each other from the inner faces of the end walls. Fixed to the under face of the lower wall is a guard 29 which extends into the space between the fingers 28 slightly below the centers thereof as shown in Fig. 4.

The blades 30 and 31 are carried by the head with the forward edges thereof resting against the fingers 28. The inner faces of the fingers 28 are here shown by way of example as being flat and disposed normal to the plane which bisects the acute angle between the blades. The parts of the head are so dimensioned that the cutting edges of the blades 30 and 31 are set parallel to each other and spaced a predetermined distance apart. The guard 29 terminates at its outer edge in a curved flange 32 which extends beyond the plane defined by the cutting edges of the blades.

The blades 30 and 31 are clamped against inner surfaces of the upper and lower walls 22 and 23 with their forward edges in contact with the fingers 28 by a wedge-shaped element 35. Such element is reciprocally mounted within the frame of the head and comprises upper and lower plates 36 and 37 and end plates 38, all said plates being rigidly connected. The upper and lower plates 36 and 37 are in planes parallel to those of the adjacent upper and lower walls 22, and 23 and form therewith blade-receiving pockets and their forward edges are spaced apart as shown in Fig. 4. In each end plate 38 is formed a transverse slot 39 which receives a stud 40 eccentrically mounted upon a disc 41 rotatably mounted in the adjacent end wall of the head. The discs 41 are connected by a strap 42 secured at its ends to the discs.

The rotation of the discs 41 by swinging the strap 42 into the position shown in Figs. 1, 2, and 4 causes the studs 40 to advance the wedge element 35 into the position shown in Fig. 4 and clamp the blades 30 and 31 in the pockets against the inner faces of the walls 22 and 23 with the cutting edges against the fingers 28. Rotation of the discs 41 in the opposite direction moves the element 35 outwardly and releases the blades 30 and 31 so that they will drop out of the head when properly tilted. Pins 43 normally check this movement of the discs by engagement with the strap 42. Those pins are tapered and hence further rotation of the discs so that the ends of the

strap 42 ride up on the pins 43 will separate the discs 41 to such an extent that the studs 40 disengage the slots 39 and permit separation of the element from the head. (See Fig. 3.)

From the above description it will be apparent that the insertion or removal of the blades 30 and 31 is readily and easily carried out. When the blades are to be inserted the strap 42 is raised to retract the element 35 and increase the width of the spaces between the upper and lower walls of the head and the upper and lower plates. The blades are dropped into such spaces onto the fingers 28 and the strap is thereafter lowered to its normal position thus advancing the element 35 to position the blades on the fingers 28 and clamp them in such position. The frictional contact between the blades and the element 35 obviously increases as the element is advanced and hence if it should happen that a blade be not in contact with both fingers 28 the advance of the element will shift it into such position.

As shown in Fig. 12, the guard 29 and the forward edge of the blade 30 are in contact with the skin while that edge of the blade 31 is out of such contact or only slightly in contact with the skin. Hence, when shaving, the guard 29 presses upon the skin and slightly depresses it, while the forward edge of the blade 31 catches and lays over the hair or stubble and holds it in such position until it has been severed by the cutting edge of the blade 30 along a line nearly normal to the hair length and slightly below the surface due to the tilting of the hair or stubble by the blade 31.

Since, as clearly appears, the forward edges of the blades 30 and 31 are spaced apart, the severed hair or stubble will collect in the space between the blades designated in Fig. 4 of the drawing by the numeral 27 and previously referred to as the mouth of the head. After shaving is completed the matter collected can easily be removed by a stream of water passed through the element 33.

The embodiment shown in Figs. 5, 6, and 7 is generally similar to that just described, and the parts in this embodiment which correspond to that in the previously described embodiment will be designated and referred to by the same or similar numerals without any detailed description thereof. The wedge-shaped element 35^a is in this embodiment permanently secured in the frame of the head 20^a. The element is movable toward and from the mouth 27 being pivotally supported upon studs 50 carried by arms 51 at each side of the element 35^a and projecting into slots 52 formed in the end plates 38^a. The arms are movable in depressions 53 generally triangular in conformation, formed in the inner faces of the end walls of the head, only one wall 24^a being here shown. By rocking the arms 51 in the depressions 53, the element 35^a is advanced or retracted. As here shown extensions of the walls 24^a with the depressions 53 therein project below the lower wall 23^a of the head so that the lower ends of the arms 51 are exposed and are connected by a rod 54 rigidly secured thereto. The portion of the rod 54 midway between the ends is bent downwardly and surrounded by a sleeve 55 fixed at the upper end of a post 56 which reciprocates in the hollow center of the handle 21^a. At the lower end of the handle is provided a knob 57 attached to a sleeve 58 which enters the interior of the handle and surrounds the post 56. The post 56 is externally threaded and meshes with internally formed threads on the sleeve 58 (see Fig. 7) so that upon rotation

of the knob 57 the post 56 is raised or lowered to rock the arms 51 and advance or retract the element 35^a.

As in the first described embodiment, the blades 30 and 31 rest against fingers 28^a and are clamped between the upper and lower walls 22^a and 23^a respectively of the head and the upper and lower plates 36^a and 37^a of the element 35^a. The guard 29^a coacts with the fingers 28^a and has the relative relation to the forward edges of the blades shown in Fig. 12 so that a razor constructed according to this embodiment functions in the manner previously described.

In both these embodiments the blades 30 and 31 are held against the plane inner face of the fingers 28^a by the wedge element 35^a and the side walls 22^a and 23^a which also press upon the side faces of the blades and hold them against shifting from their normal planes. The side walls 22^a, 23^a as well as the coacting walls of the wedge element may be skeletonized or reticulated (indicated by dotted lines in Fig. 5) not only to reduce the weight of the razor but also to decrease the possibility of an accumulation of dirt, soap, or other extraneous matter which would tend to shift the blades out of their normal planes.

The embodiment shown in Figs. 8 and 9 differs from those previously described with respect to the means by which the blades 30 and 31 are clamped in the head 20^b with the forward edges thereof bearing upon fingers 28^b. In place of a wedge-shaped element which clamps the blades against the inner faces of the upper and lower walls 22^b and 23^b, there are provided locking bars 60. The bars 60 are formed at their ends with integral pintles 64 (Fig. 9) which project into openings in the end walls 24^b and 25^b so as to support the bar for rotation or pivotal movement. Each bar is formed with a longitudinally extending groove 62 constructed and arranged so that when the bar is rotated to blade-holding position the groove 62 receives the rear edge of the associated blade and holds it in proper position against the adjacent head wall with its opposite edge bearing against fingers 28^b, as shown more clearly in Fig. 9. The bars are held in blade-holding position by means of spring clips 61, the free ends of which engage the recessed portions 65 yieldingly to urge the bars against their associated blades and thus prevent rotation toward blade-releasing position. The forward edges of the blades are spaced a predetermined distance apart by fins 63 on the inner faces of the end walls extending rearwardly from the inner faces of the fingers (only one fin being here shown). The grooves 62 in the bars 60 act to hold the blades against shifting out of their normal planes and in contact with the inner faces of the side walls 22^b and 23^b.

The three embodiments described are particularly designed for use with wafer blades of the single edge type, and, as pointed out above, include means by which the blades are held in their normal planes with their forward edges resting on the inner faces of the fingers at a predetermined distance apart. It will be understood however that the invention is not limited to blades of any particular type and that, if desired, other embodiments thereof adapted for the employment of other types of blades may be made. For example, the embodiment which is shown in Figs. 10 and 11 and which will now be described, is one in which blades of the type

used in the well known Rolls razor are employed.

In that embodiment the head 70 comprises end walls 71, a lower wall 72, a cross rod 73 connecting the end walls, and a cross strap 74 of spring metal fixed at its ends to the upper edges of the walls 71 midway the length thereof. Carried by the forward ends of the end walls 71 are fingers 75 which project a short distance toward each other from the inner faces of the end walls. Midway between the cross rod 73 and the fingers 75 are studs 76 which project toward each other from the inner faces of the walls 71 (one only being here shown). Fixed to the lower wall 72 is a guard 77 here shown in the form of a plate having a plurality of upwardly projecting fingers 78 at the forward edge thereof.

The blades 80 and 81 are mounted in the head with recesses at each end of the forward edges in contact with the fingers 75 and positioned thereby in the same relation to the guard 77 as is true of the blades and guards in the other embodiments. The upper blade is yieldably held in contact with the rod 73 and studs 76 by the cross strap 74 and in contact with the fingers 75 by a band 82 pivoted at its ends to the walls 71. The band 82 is of spring metal and is so formed that it bears upon the rear edge of the blade midway between the ends thereof. The lower blade 81 is similarly held in contact with the rod 73 and studs 76 by the lower wall 72 and with the fingers 75 by another band 83 of spring metal pivoted at its ends. As shown in Fig. 11, the portions of the rod 73 and studs 76 bearing upon the blade are cylindrical so that they have only line contacts therewith. Circumferential grooves are cut or formed in the rod 73 to reduce to a minimum any frictional resistance. (See Fig. 10.) The inner faces of the fingers 75 are, like the fingers 23, in a plane normal to the plane which bisects the center angle between the blades or at some definite angle thereto.

While certain embodiments of this invention have been shown and described in detail, it will be understood that the invention is not limited thereto and that other embodiments may be made without departing from the spirit and scope of the invention as set forth in the following claims.

I claim:

1. A safety razor of the type wherein two blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the head includes rigid end walls, a pair of fingers against which the ends of the forward edges of both blades bear, the inner faces of the fingers against which the blades rest being in a common plane at a predetermined angle to the plane which bisects the acute angle formed by the blades, and cooperating parts including means pivotally mounted on said end walls for advancing the blades against the inner faces of the fingers and clamping them in such position.

2. A safety razor of the type wherein two blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the head includes rigid end walls, a pair of fingers against which the ends of the forward edges of both blades bear, the inner faces of the fingers against which the blades rest being in a common plane normal to the plane which bisects the acute angle formed

by the blades and cooperating parts including means pivotally mounted on said end walls for advancing the blades against the inner faces of the fingers and clamping them in such position.

3. A safety razor of the type wherein two blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the head includes rigid end walls, a pair of fingers against which the ends of the forward edges of both blades bear, the inner faces of the fingers against which the blades rest being in a common plane normal to the plane which bisects the acute angle formed by the blades and cooperating parts including means pivotally mounted on said end walls for holding the blades against the inner faces of the fingers.

4. A safety razor of the type wherein two blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the head includes a pair of fingers against which the ends of the forward edges of both blades bear, a wedge-shaped element against the sides of which the blades rest, said element having slots in the end walls thereof and movable means including studs which enter said slots and advance the element toward the fingers.

5. A safety razor of the type wherein two blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the head includes a pair of fingers against which the ends of the forward edges of both blades bear, rigid end walls, rollers between the blades and having line contacts with the adjacent faces of the blades, and pivotally mounted bands of spring metal carried by said end walls adapted to bear upon the rear edges of the blades to hold the forward edges thereof yieldably against said fingers.

6. A safety razor of the type wherein two blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the head includes a pair of fingers against which the ends of the forward edges of both blades bear, rigid end walls, and pivotally mounted elements carried by said end walls adapted to bear upon the rear edges of the blades and hold the forward edges thereof against said fingers.

7. A safety razor of the type wherein two thin blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the razor head includes a pair of rigid side walls against the inner faces of which the blades rest, a pair of fingers against which the ends of the forward edges of both blades bear, rigid end walls, and a pair of bars pivotally mounted in the end walls, each bar having a groove therein which receives the rear edge of a blade and positions it against a side wall with its forward edge against the inner faces of said fingers.

8. A safety razor of the type wherein two thin blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the razor head includes a pair of rigid side walls against the inner faces of which the blades rest, a pair of fingers against which the ends of the forward edges of

both blades bear, rigid end walls, a pair of bars pivotally mounted in the end walls, each bar having a groove therein adapted to receive the rear edge of a blade, and means for yieldably holding said bars in contact with said blades whereby the blades are positioned against the side walls with the forward edges thereof against the inner faces of said fingers.

9. A safety razor of the type wherein two thin blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the razor head includes a pair of rigid side walls against the inner faces of which the blades rest, a pair of fingers against which the ends of the forward edges of both blades bear, rigid end walls, a pair of bars pivotally mounted in the end walls of the head, each bar having a groove therein adapted to receive the rear edge of a blade, and spring clips carried by the side walls of the head which clips yieldably hold said bars in contact with said blades whereby the blades are positioned against the side walls with the forward edges thereof against the inner faces of said fingers.

10. A safety razor of the type wherein two thin blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the razor head includes a pair of rigid side walls, a wedge-shaped element mounted between the side walls and forming therewith a pair of inclined pockets which receive the blades, a pair of fingers against which the ends of the forward edges of both blades rest, the inner faces of said fingers against which the blades rest being in a common plane normal to the plane which bisects the acute angle formed by the blades, said element being movable relative to said side walls toward and from the fingers and means for actuating said element whereby when the element is advanced the blades are held firmly clamped against the inner faces of the side walls and positioned upon the fingers.

11. A safety razor of the type wherein two thin blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the razor head includes a pair of rigid side walls, a wedge-shaped element mounted between the side walls and forming therewith a pair of inclined pockets which receive the blades, a pair of fingers against which the ends of the forward edges of both blades rest, the inner faces of said fingers against which the blades rest being in a common plane normal to the plane which bisects the acute angle

formed by the blades, said element being mounted for movement in the head relative to said side walls and toward and from the fingers, and rotatable means carried by the end walls of the head in engagement with said element for reciprocating the same.

12. A safety razor of the type wherein two thin blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the razor head includes a pair of rigid side walls, a wedge-shaped element mounted between the side and end walls and forming therewith a pair of inclined pockets which receive the blades, a pair of fingers against which the ends of the forward edges of both blades rest, the inner faces of said fingers being in a common plane at a predetermined angle to the plane which bisects the acute angle between the blades and cooperating parts including means pivotally mounted on the end walls for holding the blades in contact with the fingers.

13. A safety razor of the type wherein two thin blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the razor head includes a pair of rigid side walls, a wedge-shaped element mounted between the side walls and forming therewith a pair of inclined pockets which receive the blades, a pair of fingers against which the ends of the forward edges of both blades rest, the inner faces of said fingers being in a common plane normal to the plane which bisects the acute angle between the blades and cooperating parts including means pivotally mounted on the end walls for holding the blades in contact with the fingers.

14. A safety razor of the type wherein two thin blades are mounted in the razor head at acute angles to each other with their cutting edges parallel and spaced a predetermined distance apart characterized in that the razor head includes a pair of rigid side walls, a wedge-shaped element mounted between the side walls and forming therewith a pair of inclined pockets which receive the blades, a pair of fingers against which the ends of the forward edges of both blades rest, said element being mounted for movement in the head relative to said side walls and toward and from the fingers and having transverse slots in the end walls thereof, a pair of discs rotatably supported in the end walls of the head, studs eccentrically mounted on said discs and received in said slots and means for rotating said discs and thereby actuating said element.

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