March 7, 1944. J. H. RAND, JR. 2,343,705

ELECTRIC RAZOR

Filed Dec. 23, 1939 2 Sheets-Sheet 1

FIG. 1

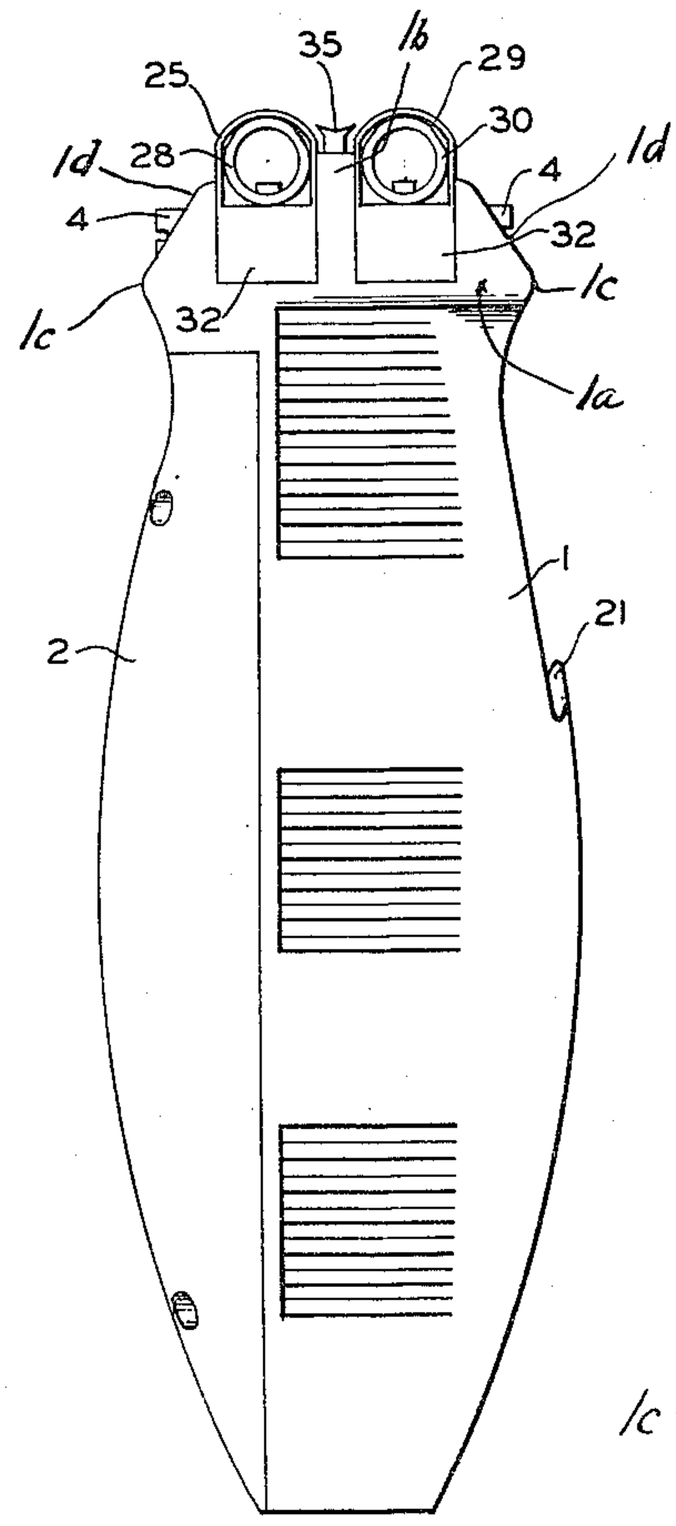

FIG. 2

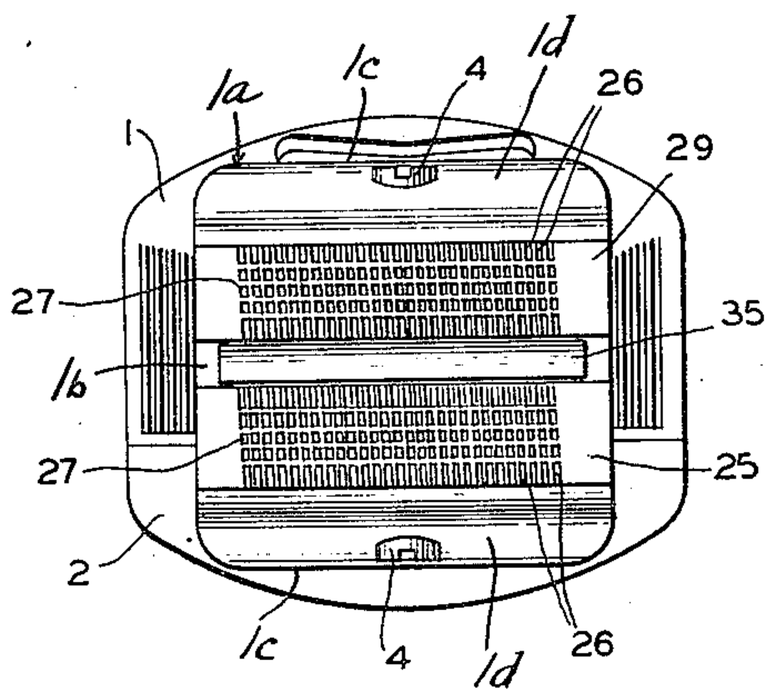

FIG. 3

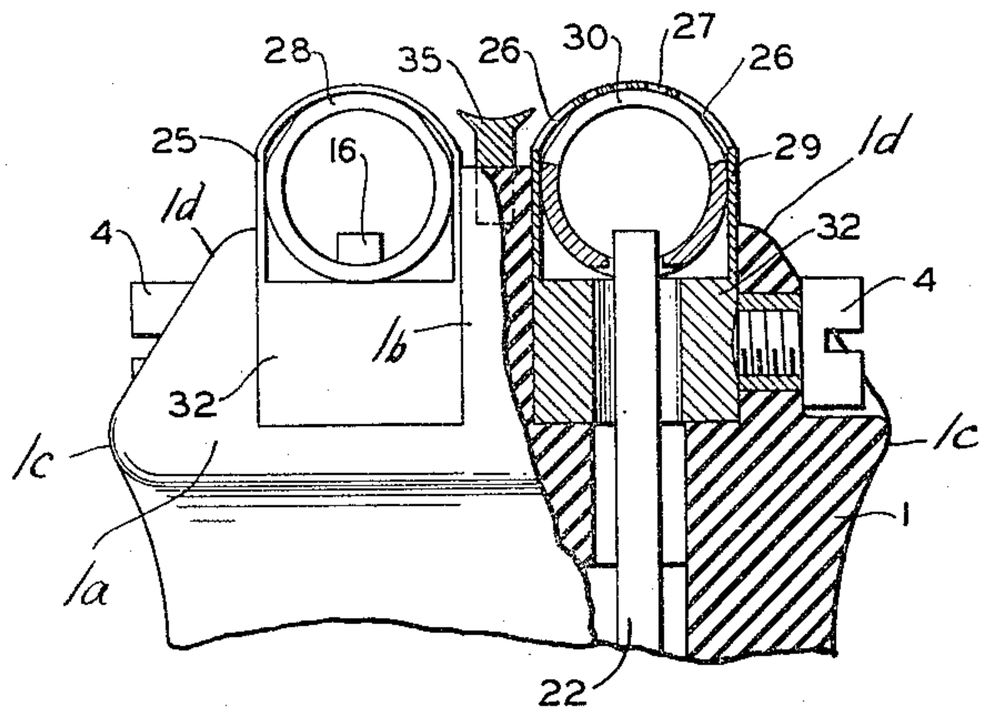

FIG. 6

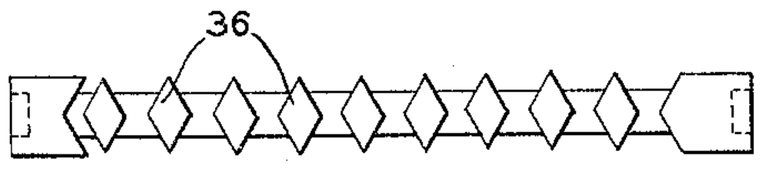

FIG. 7

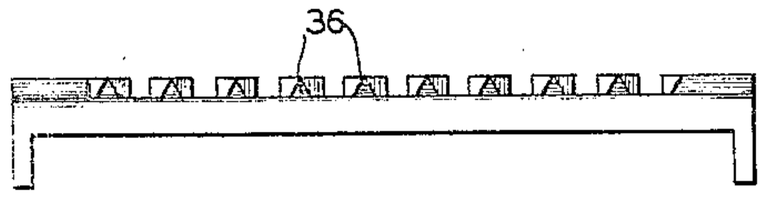

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FIG. 4

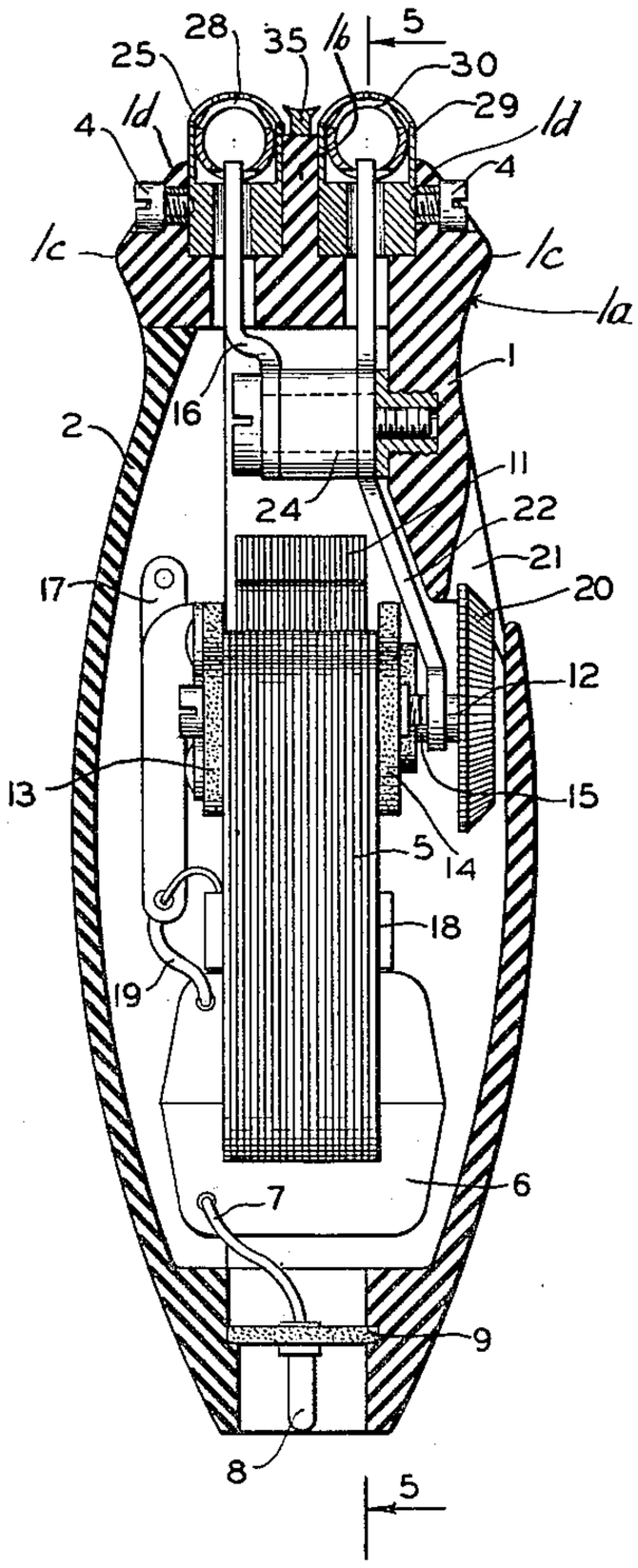
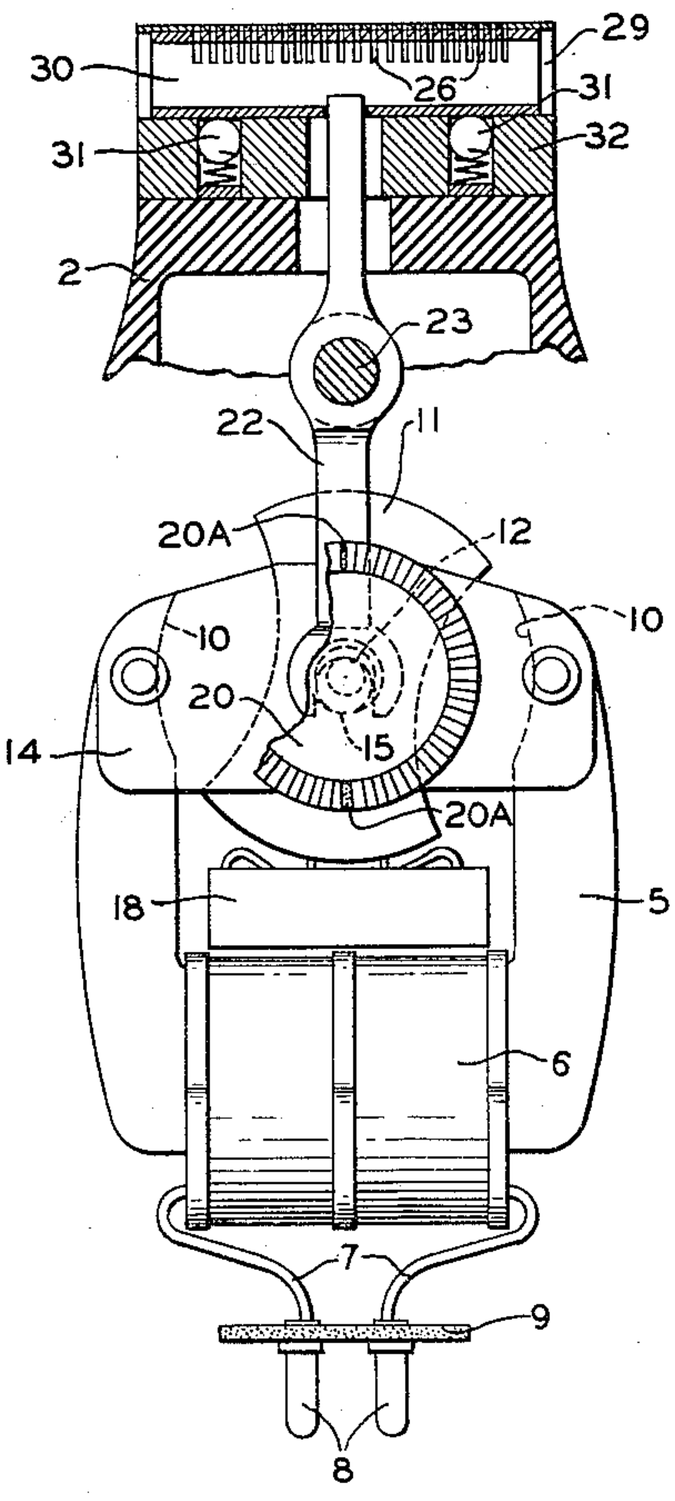


FIG. 5



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ELECTRIC RAZOR

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3 Claims. (Cl. 30—43)

This invention relates to improvements in mechanical razors, in which two or more individual shearing heads are utilized.

Heretofore razors have been provided with a shearing head comprising a plurality of shear plates formed in a unitary structure, the inner cutter also being formed in one piece, with cutter bars for each shearing surface. This form of razor was found to be inefficient and expensive to manufacture, due to the minute exactness required to provide a correct shearing action between the inner and outer cutters. Also, it was very difficult to adjust and keep in adjustment the inner cutter with respect to the shear plate.

It is, therefore, the principal object of this invention to provide a razor having a plurality of spaced heads operated from a common drive.

More specifically, it is the object of this invention to produce a multiple head shaving device, comprising two or more independent and individually replaceable shearing heads operated by a common motive device.

Another object is to provide a multiple-head shaving device having a hair tripping element located independently of and between the shearing heads.

The invention comprehends the provision of a shaver construction having a casing formed to provide a compartment open at one side to receive the motor, while one end of the casing is provided with a head supporting section constructed to receive a plurality of independent and individually replaceable shearing or shaving heads so arranged that they will cooperate simultaneously in shaving and are all operated from the motor in said compartment.

A more clear conception of the operation, construction, and further objects of the invention may be had from the following specification when taken in conjunction with the accompanying drawings, in which

Fig. 1 is a vertical side elevation of a razor showing the invention;

Fig. 2 is a top plan view of Fig. 1 slightly enlarged;

Fig. 3 is an enlarged view of the shaving heads showing one in cross section;

Fig. 4 is a vertical transverse cross-sectional view through the heads showing the motor in side elevation;

Fig. 5 is a cross sectional view taken along line 5—5 of Fig. 4;

Fig. 6 is a detail plan view of a modified form of hair tripping element; and

Fig. 7 is a side elevation of Fig. 6.

The detailed advantages of the construction disclosed herein will be best appreciated after a discussion of the details of the structure embodied therein. For this reason reference to the advantages will be deferred until later.

In the structure of Figs. 1 to 5, inclusive, the housing which provides a handle for holding the device and manipulating it, and enclosing the operating mechanism, is moulded, or otherwise formed, of suitable material so as to comprise the main body portion or casing 1 and the removable cover 2. These assembled parts are shaped to conform to the hand, and, at the upper end, is provided a pair of transverse grooves, in which the shearing heads are removably mounted.

The upper end of casing 1, as illustrated in the drawings, is formed to provide a head supporting structure 1*a* that extends beyond the end of cover 2. It is this portion of the casing that is provided with the transverse grooves or channels to receive the shearing head. The drawings illustrate the shaver as having the casing formed with two spaced channels for receiving two shearing heads. Between the channels head supporting section 1*a* is formed with a spacer member 1*b*, while the side portions of section 1*a* at the opposite sides of the channels are enlarged to form ribs 1*c* in order to provide adequate strength in the head supporting section for efficiently mounting and carrying a plurality of shaver heads. The outer faces of ribs 1*c* are tapered or inclined as indicated at 1*d* toward the free end of head supporting section 1*a* so that the side portions of the casing will not interfere with the use of the shaver head in the shaving operation. The ribbed portions 1*c* of head supporting section 1*a* of the casing provide a pair of oppositely arranged jaw members that cooperate to receive the shaver heads therebetween so that screws 4 carried thereby form a retaining means operable in such a manner that they have a clamping action through cooperative movement of screws 4 toward each other to rigidly clamp the plurality of shaver heads between the jaws for rigid support on the casing These retaining elements 4 provide a plurality of retaining means or elements independently engaging the several shaver heads for effectively retaining them in the channel structure and at the same time providing for interchanging each head with the other, as well as providing for the replacement of any head in a convenient manner.

The motor comprises a U-shaped core 5, pref-

erably built up of steel laminations, and shaped to receive the magnetizing coil 6 formed around the base thereof. These laminations are secured together in any suitable manner, as by riveting, as indicated in Figs. 4 and 5, and the legs thereof are shaped to provide the poles 10. The current supply leads 7, for the coil 6, are connected to a pair of terminal prongs 8, mounted on a suitable plate 9, of insulating material, mounted in the housing. Connection to these terminals may be made by means of any suitable connector plug forming part of the current supplying cable commonly used with such devices.

Secured to the opposite sides of the core 5, so as to enclose the pole faces from the sides, is a pair of insulating plates 13 and 14, which may be secured thereto by means of screws, as shown, or other suitable means. Journaled in these plates is a shaft 12, which extends transversely of the longitudinal axis of the core, and at right angles to the path of oscillation of the inner cutter in the shearing head. The shaft has mounted thereon, between the insulating plates, a suitably shaped armature 11 comprising a plurality of steel laminations secured together. The peripheral ends of the armature are shaped to move in a circular path in close relation to the pole faces 10. Secured to the shaft 12 is an eccentric 15, which lies within the bifurcated ends of the lever 22. This lever is pivotally mounted upon the pivot pin 23 secured in the rear wall of the housing as shown. Fastened to the lever 22 is a collar 24, to which is secured, in turn, a drive arm 16, thus forming a unitary actuator arm for the two shearing heads.

At 17 is generally shown a suitable make and break mechanism, comprising a pair of contacts, which alternately engage and disengage by reason of a cam acting therebetween, and mounted on shaft 12. This cam is not shown. It is positioned with respect to the circular pole ends of the armature, so as to make and break the circuit to the coil 6 in the proper timed relation in accordance with well known practice, to effect continuous rotation of the armature. The mechanism of this type, as is well known, adapts the device to operation from either alternating or direct current circuits. The contacts are connected in series with the winding 6 by means of the leads 19, and are shunted by means of condenser 18 to reduce sparking, all in accordance with well known practice.

As is clear from Fig. 4, the body portion 1 of the housing is provided with an opening 21, through which a knurled wheel 20 may be engaged by the thumb to effect rotation thereof. This wheel is secured to the shaft 12, and is employed, as is well known, for purposes of starting the motor in the event that it stops after previous use in a dead center position, i. e., so that the contact operating cam holds the contacts apart, thereby breaking the circuit through the coil 6. Any necessity of rotating the wheel 20 may be obviated by placing distinguishing marks, such as 20*a*, on the wheel, which indicate to the operator when the contacts are closed. If the wheel is positioned with this mark showing through opening 21, as in Fig. 4, the motor will start as soon as the current is supplied without the necessity of twirling the wheel 20.

There are two shearing heads 25 and 29, each comprising a U-shaped plate of thin steel, secured to a base 32, to form a base portion which is rectangular in shape to fit the groove in the upper portion of the casing 1. The upper portion of the plate is formed to provide a shearing section having slots and perforations forming cutter bars, as is the common practice. The shearing or shaving sections extend outwardly beyond the end of the casing in the same direction so as to be in a position for simultaneous shaving cooperation.

As is shown in Fig. 2, the shear plate is formed with two rows of slots 26, which are located at a slight angle to the longitudinal axis of the cutter, and on each side of a center portion of reduced thickness (Fig. 3), in which rectangular perforations 27 are formed. The slots 26 act as hair guides, and are adapted to cut long hair, such as side burns, while the perforations are for cutting short hairs. The plate is reduced at the point where the perforations are formed to insure a close shearing action.

Mounted in the U-shaped portion of the shear plate is an inner cutter 28, which is shown in the form of a cylinder, the inner bore being concentric, one arc of which is transversely slotted to form cutter bars. The lower surface of the inner cutter is notched to receive the upper end of the operating lever 22 in the case of cutter 30, and drive arm 16 in the case of cutter 28.

As is clear in Figs. 4 and 5, each inner cutter, that is, the cutters 28 and 30, is pressed upwardly against the rear faces of the shear plate by means of spring pressed balls 31, contained in the base of the shear plate.

In Fig. 4 is is noted that each shearing head is locked in its respective groove in the housing by means of a set screw 4 engaging the base of the shear plate, thereby permitting it to be located and removed as a unit.

It has been found by actual test that double headed razors of this type are best driven by a motor, the shaft of which rotates at right angles to the path of oscillation of the inner cutters, that is, if a rotating motor is used, that most efficient and desirable manner of drive is to actuate an oscillating drive arm by means of a cam on the shaft, the shaft being located at right angles to the drive arm.

It will be apparent that no close adjustment of parts in the shearing heads is necessary, as each is a separate and distinct unit in itself, each inner cutter being spring-urged into engagement with its respective shear plate by the balls 31. In former types where the multiple heads were all one piece, and the inner cutter one piece, it was next to impossible to secure a lasting adjustment between parts. Thus, it is obvious that a razor formed as disclosed has the advantage of being simple to manufacture, and efficient in operation, due to ease of adjustment.

Another important advantage of the construction of this type will be realized when consideration is had of the device in use. Let it be presumed that the two heads are being moved over the face, so that the head 29 of Fig. 1 precedes the head 25 with respect to their direction of travel. The frictional engagement of the skin with the head 29 will tend to stretch the skin in the direction of the movement of the head, thereby insuring that the trailing head 25 is operating over a smooth flat surface resulting from stretching the skin. Thus, the hairs which are not removed by the leading head are sure to be removed by the trailing head.

However, even though the leading head does tend to stretch the skin, there is a slight roll formed between the heads which assists in bringing the hair into better contact with the trailing

head. Advantage of this feature is made use of by providing a hair tripping device 35. It is well known that the hair does not grow straight out of the skin, but at an angle, thereby causing the hair to lay over, making it difficult to reach with a mechanical razor. The tripping device, or comb, 35 which is formed as shown in Fig. 4, comprises a bar of any suitable material, located between the heads, which will trip or raise the hair, thereby placing it in position to be cut by the cutter bars.

A modified form of trip bar is shown in Figs. 6 and 7. Here the bar is slotted to form diamond-shaped bars 36, which not only trip the hair, but tend to act as a comb bar to align the hair with the cutter bars.

While there is above described but one embodiment of the invention, it is possible to produce still other embodiments without departure from the inventive concept above disclosed, and it is, therefore, desired that only such limitations shall be imposed on the appended claims as are stated therein, or required by the prior art.

What I claim as new, and desire to secure by Letters Patent, is:

1. In a multiple head shaver, a casing, a head supporting section at one end, said section having a channelled portion, a plurality of shaver heads each having a base portion engaged in said channelled portion and a shaving section projecting outwardly beyond said supporting section, a spacer extending transversely of said section in said channelled portion between said base portions for spacing said shaver heads apart, and a hair tripping device mounted on the free edge of said spacer and projecting outwardly between said shaving sections of said shaver heads for cooperation therewith in causing hair to be raised for cutting by said heads, and a plurality of retainer elements one for each head mounted in said head supporting section for independently retaining said heads on said casing in engagement with said spacer.

2. A shaver comprising a casing, a pair of separated independent shaver heads mounted on and projecting outwardly from one end of said casing in spaced relation for simultaneous shaving cooperation, and a hair tripping device mounted on said casing between said shaver heads and projecting outwardly between said shaver heads for cooperation therewith in causing hair to be raised for cutting by said heads.

3. A shaver comprising a casing, a pair of separated independent shaver heads mounted on one end in spaced relation with shaving sections extending outwardly in the same direction for simultaneous shaving cooperation, and a hair tripping device formed of a bar having one edge secured to said casing between said heads in spaced parallel relation and the oppositee edge extending outwardly between said heads for cooperation with said shaving heads in combing and raising hair during the shaving operation.

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