ABSTRACT OF THE DISCLOSURE

A plastic safety razor has a body formed of a head and a handle molded in one piece of resilient plastic material. The head is molded with a thin slot open at the front of the head and at opposite ends of the head, and the face walls of the slot are spaced apart by the thickness of a blade adapted to be held within the slot. The slot is closed by a back wall which forms a rear abutment for a single edge blade held in the head. The blade has blunt edges at the extremities of its sharpened edge and is pushed endwise into the slot and by engagement with the blunt edges is seated rearwardly against the back abutment wall of the slot. Curved fingers extend forward from the slot and under the sharpened edge of the blade, and a gliding plane slopes downward from the head toward the cutting edge of the blade at approximately 25° angle to the blade. The integral handle extends forwardly from the head at an angle of 75° to a position forward of the cutting edge of the blade, and the handle is channel shaped with the open side of the channel facing forward. Such a combination of features allows economical and accurate molding of the razor body, accurate and efficient seating of the blade within the razor head, provides a comfortable shave with an easily manipulated tool, and allows the razor to be made cheaply enough to be discarded after use.

Another object of the invention is to provide a practical, inexpensive disposable razor that can be manufactured at sufficiently low cost to permit its sale as a part of an inexpensive emergency kit containing all shaving necessities for at least a single satisfactory shave.

Another object of the invention is to provide an inexpensive, practical disposable razor in which the blade is permanently secured in place in the head of the razor, in proper position for optimum shaving efficiency and comfort.

A related object of the invention is to provide a simple and inexpensive manufacturing process for the production of razors of the character described.

Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims; and to these and other ends, the invention will be hereinafter described, the novel features being pointed out in the claims at the end of this specification.

In the drawing:

FIG. 1 is a perspective view of a safety razor that is constructed in accordance with one embodiment of the invention, showing a finished razor with the blade seated in the razor head;

FIG. 2 is a side elevation, on an enlarged scale, of this safety razor, with the blade removed;

FIG. 3 is a fragmentary rear elevation of the razor head, taken on the line 3—3 of FIG. 2, looking in the direction of the arrows;

FIG. 4 is a fragmentary sectional view on an enlarged scale, taken on the line 4—4 of FIG. 3, looking in the direction of the arrows, and showing the razor blade seated in the razor head and permanently bonded in its seated position by an adhesive bond;

FIG. 5 is a top plan view, on an enlarged scale, of a blade of a conventional type, that can be used in a razor that is constructed in accordance with this invention;

FIG. 6 is a top plan view of the razor head, with the blade removed;

FIG. 7 is a top plan view of the razor head, showing the blade partly inserted in a slot in the head, the direction of movement of the blade for further insertion being indicated by the arrow;

FIG. 8 is a top plan view of the razor head and blade, showing the blade inserted in the slot along its full length, the arrows indicating the locations at which and the direction in which force may be applied to complete seating of the blade in the slot in the razor head;

FIG. 9 is a top plan view of the razor head showing the blade seated in the head, and showing the application of a drop of a liquid bonding material; and

FIG. 10 is a top plan view thereof after hardening of the bonding material.

Referring now in detail to the drawings by numerals of reference, the numeral 10 denotes a unitary safety razor that is molded from a synthetic plastic material such as, for example, polystyrene, polyvinyl chloride, or the like. The razor 10 is formed with a handle 12 that is in the form of a generally U-shaped channel and that is integrally united with the head 14 of the razor.

The razor head 14 is formed with an elongate, generally rectangular slot 16 (FIG. 2) that is open at its ends and that extends lengthwise of the razor head and that opens along the front side of the razor head. The razor head 14 is also formed with an upper portion 18 over the slot 16 and with a lower portion 20 below the slot. The back of the razor head 14 is rounded, as shown in FIGS. 2 and 4, to provide a curved, smooth, contour between a flat surface portion 24 on the upper portion 18 of the razor head and the back surface of the razor handle 12. The upper portion 18 of the razor head is tapered outwardly toward the front of the razor head and is

This application is a continuation of application, Ser. No. 229,927, filed Oct. 11, 1962, now abandoned.

This invention relates to the construction of razors and to methods of making razors. More particularly, the invention relates to expendable or disposable razors, and to methods of making them.

There are many occasions when an individual would find the use of a good razor to be a comfort and convenience, under circumstances where the services of a barber are not readily available and where it is either undesirable or uneconomical to purchase an ordinary razor. For example, travelers frequently find themselves in need of razors together with shaving soap, blades and other needs for shaving comfort, while away from home unexpectedly or caught in circumstances that do not permit a visit to the home or to a barber shop.

Various types of disposable razors have been proposed in the past, but none have been adopted on a widespread scale, perhaps because of high manufacturing costs. One object of the present invention is to provide a practical, disposable razor, that can be manufactured at a reasonable cost.

Another object of the present invention is to provide a practical type of safety razor in which the razor blade is held into the head of the razor.

Another object of the invention is to provide an inexpensive, disposable safety razor that will provide satisfactory shaving service for several shaves.

A further object of the invention is to provide an inexpensive disposable razor, that can be manufactured at a moderate cost, and that can be used for at least one, and usually more than one, satisfactory shave.

Another object of the invention is to provide a practical, inexpensive disposable razor that can be manufactured at sufficiently low cost to permit its sale as a part of an inexpensive emergency kit containing all shaving necessities for at least a single satisfactory shave.

Another object of the invention is to provide an inexpensive, practical disposable razor in which the blade is permanently secured in place in the head of the razor, in proper position for optimum shaving efficiency and comfort.

A related object of the invention is to provide a simple and inexpensive manufacturing process for the production of razors of the character described.

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FIG. 5 is a top plan view, on an enlarged scale, of a blade of a conventional type, that can be used in a razor that is constructed in accordance with this invention;

FIG. 6 is a top plan view of the razor head, with the blade removed;

FIG. 7 is a top plan view of the razor head, showing the blade partly inserted in a slot in the head, the direction of movement of the blade for further insertion being indicated by the arrow;

FIG. 8 is a top plan view of the razor head and blade, showing the blade inserted in the slot along its full length, the arrows indicating the locations at which and the direction in which force may be applied to complete seating of the blade in the slot in the razor head;

FIG. 9 is a top plan view of the razor head showing the blade seated in the head, and showing the application of a drop of a liquid bonding material; and

FIG. 10 is a top plan view thereof after hardening of the bonding material.

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The razor head 14 is formed with an elongate, generally rectangular slot 16 (FIG. 2) that is open at its ends and that extends lengthwise of the razor head and that opens along the front side of the razor head. The razor head 14 is also formed with an upper portion 18 over the slot 16 and with a lower portion 20 below the slot. The back of the razor head 14 is rounded, as shown in FIGS. 2 and 4, to provide a curved, smooth, contour between a flat surface portion 24 on the upper portion 18 of the razor head and the back surface of the razor handle 12. The upper portion 18 of the razor head is tapered outwardly toward the front of the razor head and is
formed with a flat, frontwardly- and lengthwise-extending surface 26 (FIGS. 2 and 4), of substantial area, that is disposed immediately above the front opening of the slot 16. The lower portion 20 of the razor head is formed with a plurality of projecting fingers 28 that project to the front of the razor head and that are formed with substantially uniformly rounded upper surfaces. These fingers are spaced from each other along the length of the razor head.

The razor head is also formed in its back side with a notch 30 that communicates with the slot 16. The several parts of the razor head are proportioned snugly to receive and to cooperate with a razor blade 32 of a common type that is ordinarily referred to as an inductor blade. This blade 32 is provided with a sharpened, lengthwise-extending edge 34 that is formed with blunt portions 36 at each of its extremities. The slot 16 may be formed with a depth that provides little or no clearance for the blade. Since the razor blade, when seated in the slot in the head of the razor, has broad surfaces that are in engagement with and in frictional contact with the confronting broad surfaces that bound the slot, the blade tends to be held in place by frictional resistance to its movement. Alternatively, when the razor is formed from a resilient plastic material, the slot may be formed in the head of the razor in such a manner that the blade is resiliently gripped between the upper portion 18 and the lower portion 20 of the razor head and thus is resiliently held in the slot.

The flat surface portion 26 of the upper portion of the razor head is disposed to lie in an imaginary plane, that, if extended, would project slightly beyond the sharpened edge of the blade when the blade is properly seated as shown, for example, in FIG. 4. Moreover, the rounded upper surfaces of the fingers 28 are designed to approach, but are not short of, tangency with that imaginary extended plane.

To make a disposable razor, complete with a blade, in accordance with one preferred embodiment of this invention, the razor is molded from a resilient, synthetic plastic material with a handle that is integral with the head of the razor. This unitary razor is molded in the form and with the structure shown in the drawing, and the slot 16 for the blade is formed preferably by the use of a blank in the mold. Alternatively, the slot may be cut in the head of the razor after molding.

To insert the blade in the razor, one end of the razor blade is inserted into one end of the slot. The blade is then moved along a path that extends lengthwise of the blade and of the razor head, as shown, for example, in FIG. 7. After the blade is inserted in the slot along its entire length, force is then applied to the two blunt portions 36 at the ends of the sharpened edge of the blade, as shown in FIG. 8, until the blade has been moved back into the slot to engage against the back wall bounding the slot, to seat the blade shown in FIG. 9.

While for many applications either frictional retention of the blade in the razor head, or resilient clamping of the blade in the razor head, is sufficient to maintain the blade in its seated position, for some critical applications where the razor must be in proper adjustment at all times such as, for example, medical applications where the razor is used in preparation for surgery, a further means for retention of the razor blade may be employed.

To this end, the blade is illustrated in FIG. 5, with a drop of liquid bonding material is applied in the notch 30 to the portion of the blade that projects into the notch. This liquid bonding material then enters or penetrates the spaces between the confronting surfaces of the blade and the walls of the slot to a degree that depends upon the viscosity of the bonding material employed. The preferred kinds of bonding materials are those that are compatible with the material from which the razor is formed. For example, when the razor is molded from a polystyrene resin, the bonding material may be polystyrene cement. Many other kinds of liquid adhesives and bonding materials are well known for forming satisfactory bonds between metal surfaces and plastic surfaces, and can be used in connection with the present invention. After the liquid adhesive hardens, it forms a hardened bond 40 that is disposed primarily at and adjacent the notch 30. The preferred embodiment of the invention, ordinary molding apparatus can be employed in which resinosus granules are introduced into a heated cylinder in which the granules are subjected to sufficient heat to permit them to flow. The molten resinosus mass is then forced by a hydraulic ram through a small orifice into a mold cavity. As soon as the plastic material hardens in the mold, the razor is ejected from the mold, and any flashing is automatically removed when the razor is ejected.

Although this invention contemplates the manufacture of razors in which the blade is retained in place in the slot in the razor head either by frictional engagement or by resilient clamping, the use of a notch in the back of the razor, together with a bonding agent applied to the blade and the razor head in the notch, represents a preferred embodiment of the invention. Whether the adhesive is used or not, the portion of the blade that projects in the notch permits visual inspection to determine at a glance whether the blade is properly seated.

Razors made in accordance with the present invention can be inexpensively produced by mass production techniques. The cost of manufacture can be sufficiently low to permit the packaging of a razor that is made in accordance with the invention, in a package together with a small quantity of shaving cream and soap, and a paper towel, in an attractively designed container, that can be sold at a reasonable and attractive price, for disposable use.

While the particular design and shape of the razor handle and razor head may be modified within the scope of this invention, I prefer a particular design, substantially as shown in the drawing, that I have found to provide ultimate shaving comfort. In this design, the angle between the plane in which the rear surface of the razor handle lies, and the plane in which the lower portion 20 of the razor head lies, is approximately 70°; the flat surface 24, on the upper portion 16 of the razor head 14, is disposed in parallelism with the lower face of the lower portion 20 of the razor head; and the flat surface portion 26 is disposed to lie in an imaginary plane, that, if extended, would form an angle of approximately 45° with the imaginary plane in which the back surface of the razor handle lies. Moreover, the walls that bound the slot 16 are formed to be substantially in parallelism with the lower surface of the lower portion 20 of the razor head and with the flat surface portion 24 of the upper portion 18 of the razor head.

I have found that this particular razor design permits the razor to be formed with a head whose length and width are small enough to permit easy maneuvering, to permit comfortable shaving under the nose and in other relatively inaccessible places, and to permit the over-all razor structure to be relatively comfortable to the touch. Furthermore, the proportions of the upper portion of the razor head and of the lower portion of the razor head are such that the surface 26 on the upper portion of the razor head and the pro-
jecting fingers 28 on the lower portion of the razor head together serve as guards for the sharpened edge of the razor blade, to protect against accidental contact with the blade and to permit cutting action only when the razor head is pressed against the skin.

While the invention has been disclosed herein by reference to the details of preferred embodiments thereof, it is to be understood that such disclosure is intended in an illustrative, rather than in a limiting sense, and it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. A disposable razor comprising:
   (a) a holder;
   (b) a blade permanently fixed in said holder;
   (c) said holder comprising a head and an integral handle molded in one piece of resilient plastic material;
   (d) said head comprising a generally rectangular, solid body of said plastic material formed to define a narrow slot bounded by continuous opposing face walls and open along the front longitudinal edge of said head and open along each opposite transverse end of said head;
   (e) said opposing face walls of said slot being spaced apart a distance equal to the thickness of said blade for closely and continuously engaging said blade and holding said blade in said slot;
   (f) said slot being closed at the back thereof by a back wall communicating with each of said opposing face walls and forming an abutment surface substantially parallel with the front longitudinal edge of said head;
   (g) said slot having substantially rectangular and of predetermined size and thickness and being sharpened along only one longitudinal edge;
   (h) said blade being dimensioned and configured relative to said head and said slot for insertion endwise into said slot in an orientation such that said sharpened edge of said blade projects from said slot along said front longitudinal edge of said head, and the unsharpened back longitudinal edge of said blade is near said back wall;
   (i) said blade having unsharpened, forward facing surfaces at the opposite extremities of said sharpened edge by which said blade can be engaged and pushed back into seated engagement with said back wall so that said sharpened edge of said blade projects from said slot at said front longitudinal edge of said head by an amount suitable for shaving, and said blade is immovably held in said slot and disposable with said holder;
   (j) a lower frontal portion of said head beneath said blade at the forward edge of the lower one of said opposing face walls of said slot being configured to define a plurality of forward pointing fingers extending forward of said sharpened edge of said blade in said seated position and curving downward from said sharpened edge of said blade;
   (k) an upper frontal region of said head above said blade being configured to form a continuous plane surface sloping downward toward said sharpened edge of said blade at an angle of approximately 25 degrees to said blade and communicating with the forward edge of the upper one of said opposing face walls of said slot;
   (l) said handle extending away from said head at an angle of approximately 70 degrees to said blade and extending forward of said sharpened edge of said blade; and
   (m) said handle being configured to define a channel formed by three integral walls integral with said head, the open side of said channel being oriented toward the front of said head.

2. A disposable razor having the structure specified in claim 1 wherein the back longitudinal edge of said head is formed to define a recess in visible communication with said back wall of said slot, and bonding material is disposed in said recess for permanently bonding said blade to said head in said seated position.

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