

PATENT SPECIFICATION

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(54) SHAVING RAZOR

(71) I, ANNA MARIA BERRETTI, an Italian Citizen, of Strada In Chianti (Florence), Via di Petigliolo 122, Italy, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns shaving razors, and more particularly a safety razor blank adapted to be folded to an operative condition for use and to an inoperative or storage condition, the blank being provided with a single blade for a single or multiple use or with a possibility for the blade to be replaced.

An object of the invention is to provide a cheap construction of razor in the form of a foldable blank which can easily be folded to its condition for use, and which can, if desired, be foldable also to a storage condition in which the blade holder is safely protected.

The present invention provides a safety razor comprising a substantially flat sheet-form blank divided into substantially rigid zones by a plurality of bending lines which enable the blank to be folded from a flat condition into an operative condition for use, characterised in that said blank comprises a first portion which, in the operative condition, forms a blade holder for holding a razor blade with a cutting edge of said blade protruding, and a further portion which, in the operative condition, forms a handle or grip of the razor, with said blade holder projecting in a stiffened position from said handle or grip.

The razor of the invention may be further characterised in that said first portion of said blank can be folded so as to protect said blade holder in a storage condition of the blank.

The configuration of the blank may be such that said further portion includes a substantially centrally-disposed triangular portion which connects by its base with said first portion of said blank, and elongate side panels which connect with one another along a simple or multiple bending line

extending along the longitudinal centre line of said further portion and connect by inclined edges with respective angled sides of said triangular portion, whereby said elongate panels can overlie one another over part of their length when said blank is in the operative condition, and define with said triangular portion, a head which supports said blade holder at an angle to the longitudinal direction of said handle or grip.

The said first portion may comprise a first transverse zone and a second transverse zone adapted to be folded, the one over the other, to form said blade holder said second transverse zone being connected by a transverse connecting strip which, in the operative condition of said blank is orthogonal to said second transverse zone and connects said blade holder to said triangular portion.

In an advantageous embodiment, the said transverse connecting strip is crossed by an angled pair of bending lines which define said angled portion, so that bending of said blank on said pair of bending lines serves, in the operative condition of the blank, to stiffen said connecting strip and said triangular portion.

Provision may be made for pairs of symmetrical triangular zones, which allow for the handle to be slightly inclined, while transversal bending lines divide said further portion into protective zones which enclose and protect said blade holder in said storage condition of said blank.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is an elevation of a preferred embodiment of the razor of the invention, showing the blank thereof in its flat and non-folded condition and a replaceable blade fitted in place;

Fig. 2 is a perspective view of the razor of Fig. 1, to a somewhat smaller scale;

Fig. 3 is a view similar to Fig. 2, but showing its first portion partially folded to form a blade holder;

Fig. 4 is a view similar to Figs. 2 and 3 but

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showing the first portion further folded to form the blade holder;

Fig. 5 is a view similar to Figs. 2, 3 and 4 but showing the blade holder now partially swung towards its projecting position;

Fig. 6 is a view similar to Fig. 5 but showing the blade holder swung substantially fully to its projecting position;

Fig. 7 is a view similar to Figs. 5 and 6 but showing a further portion of the blank partially folded to form a handle or grip of the razor;

Fig. 8 is a perspective view from a somewhat different viewpoint from Fig. 7 and showing the said further portion folded a little more towards its condition forming a handle or grip;

Fig. 9 is a view similar to Fig. 7, but showing the said further portion having been fully folded to form the handle or grip;

Fig. 10 is a perspective view from a different viewpoint showing the blank fully folded, so as to be in its operative condition;

Fig. 11 is a further perspective view taken from the rear of the razor which again is shown fully folded as in Figs. 9 and 10;

Fig. 12 is a top plan view of the fully folded razor, corresponding to Figs. 9, 10 and 11;

Fig. 13 is an edge view corresponding to Fig. 1, but showing how a blade is fitted into the razor in the flat condition of the blank;

Fig. 14 is a view comparable with Fig. 13, but showing the blank folded as in Fig. 4 so that the blade is held in the holder;

Fig. 15 is a view comparable with Figs. 13 and 14 but showing the blank folded as in Fig. 6 with the blade holder in its projecting position;

Fig. 16 is an enlarged detail showing part of Fig. 15;

Fig. 17 is a view comparable with Figs. 13, 14 and 15, but showing the razor in its condition folded for storage;

Fig. 18 is a perspective view illustrating a first folding stage involved in folding the razor from the Fig. 6 condition into the storage condition of Fig. 17;

Fig. 19 is a view comparable with Fig. 18, but showing the razor in a second folding stage in folding the razor into the storage condition of Fig. 17;

Fig. 20 is a view comparable with Figs. 18 and 19 but showing the razor in the storage condition of Fig. 17;

Fig. 21 is a fragmentary edge view, comparable with part of Fig. 13, but illustrating a second embodiment of the razor of the invention;

Fig. 22 is a view of a portion of Fig. 21 but showing a part of the blank swung to a different angle;

Fig. 23 is a view comparable with Fig. 22 but showing a third embodiment; and

Fig. 24 is a cross section showing another modification.

As shown in the drawings, the preferred embodiment of the razor of the invention comprises a substantially flat rectangular sheet-form blank 1 divided into a plurality of substantially rigid zones by a plurality of bending lines all of which will shortly be described in detail, these bending lines enabling the blank to be folded as will be described. This blank 1 may consist of a synthetic material injection moulded, vacuum moulded, or formed or shaped in any other suitable way. The rigid zones may derive their rigidity from the thickness of the material or from their shaping, and the bending lines may be provided by reduction in the thickness of the material according to the properties of the synthetic material used for the blank, which may, for example, be of polypropylene.

In the illustrated example, the blank 10 comprises a first portion, above bending line 24 in Fig. 1, which, as will be described later, serves to form a blade holder, and a further portion, below the bending line 24 in Fig. 1, which serves to form a handle or grip of the razor.

The said further portion comprises, at the end of the blank remote from the first portion, a pair of lower end rectangular substantially rigid zones 3 separated from each other by double longitudinal bending lines 5 which are symmetrical in the longitudinal direction of the blank, these two bending lines 5 having a triangular rib between them. The two rectangular zones 3 are limited by a first transverse bending line 7, near to which is a second transverse bending line 9, the two lines 7 and 9 being parallel and separated by short transverse bending zones, 10, the width of which corresponds substantially to twice the thickness of the rigid zones of the blank 1. Joining to the transverse bending line 9 are two substantially rigid triangular zones 12 which are separated from one another by extensions of the longitudinal bending lines 5 and which are further limited by a pair of angled bending lines 14. The lines 14 continue, each with a central deviation in correspondence of the inner end of the longitudinal bending lines 5, with respective extensions 16 which define two external symmetrical triangular zones 18 limited by the lines 14, by the respective extension 16 and by the respective outer edge of the blank 1. Between the lines 16 there is a substantially rigid triangular zone 20 complementary to the zones 18, 12 and 3. This triangular zone 20 is limited by a transverse bending line 22 which intersects the inclined bending line extensions 16. These inclined bending line extensions 16 terminate along the longitudinal edges of

the blank 1 in correspondence of an additional transverse bending line 24 which, together with the transverse line 22 and the end of the inclined bending line extensions 16, define a substantially rigid transverse zone 26 and two small outer rigid triangular zones 28 terminating along the longitudinal edges of the blank 1. Adjacent the bending line 24 there is a substantially rectangular rigid zone 30, followed by an additional substantially rigid zone 32 which is joined to the zone 30 by means of two outer flexible webs 34. A longitudinal window 36 between the webs 34 is designed to enable the cutting edge of a blade 37 to project there-through. The zone 30 is shaped for the reception of the blade 37 which is centred by means of two pegs 38. Two holes 40 in the zone 32 are aligned with the pegs 38 for snapping engagement together of the zones 30 and 32 to hold the cutting blade 37, upon swinging over or folding of the zone 32 against the zone 30, by bending along the webs 34. The zone 32 has a series of windows 42 which serve for discharge of hair cut by the blade 37 in the manner which will be described later. The zone 32 has tongues or fixing tooth extensions 44, for the hereinafter indicated purposes, to which mortising openings 46 in the transverse rigid zone 26 correspond. The openings 46 may be through openings or blind recesses but, of course, they must be shaped for the teeth 44 to engage and be retained therein.

In one of the zones 3 there is a peg 48 and in the other zone there is an opening 50, and similarly in the two zones 10 there are respectively a pin 52 and an opening 54.

For fitting the blade 37, this is placed on the pegs 38 in such a manner that the cutting edge is disposed in correspondence with the longitudinal window 36; then the webs 34 are folded so that the zone 32 is folded onto the zone 30 to form a blade holder with the blade 37 sandwiched between these two zones, the zone 32 being secured by the pegs 38 penetrating into and snapping into the holes 40. The arrangement may be such that the zone 32 can only be separated from the zone 30 by breaking the pegs 38. Such an arrangement is suitable for mass-production, with the entire razor having a useful life corresponding only to the useful life of the blade 37, in which case the blade will be factory fitted. However, it would be possible to make the pegs 38 so that they can be disengaged from the holes 40 to permit removal and replacement of the blade 37. The fitting of the blade 37 and the folding of the zones 30 and 32 to form the blade holder are illustrated in Figs. 1, 2, 3 and 4.

After providing for the fitting of the blade and thus after the condition shown in Fig. 4 has been attained, the blade holder,

consisting of the two matched substantially rigid zones 30, 32 is swung about the bending line 24, as shown in Figs. 5 and 6, to locate said blade holder in a position projecting substantially perpendicular to the original plane of the blank 1, and this position is fixed by engagement of the teeth 44 into the respective openings 46 in the zone 26. Thus the condition shown in Fig. 6 is achieved after passing through the condition shown in Fig. 5. These same stages are also illustrated in Figs. 13, 14 and 15, with Fig. 16 showing the engagement of the blade holder 30, 32 with the zone 26. The razor may, if desired, be set up to this condition in the production factory, especially in the case when the razor is intended to be disposable and have a life corresponding to the useful life of the blade.

In the position shown in Figs. 6, 15 and 16, the blade holder holds the blade ready for use and to enable the razor to be used, the remainder of the blank being stiffened in order to form a handle or grip by bending along the longitudinal bending lines 5 and along the inclined bending lines 14 and the extensions 16. Upon bending along the lines 5, the two zones 3 and the two zones 10 match up with and abut against each other, as also do the two triangular zones 12, the pegs 48 and 52 engaging into the respective openings 50 and 54, this bending being accompanied by corresponding bending along the lines 14 and 16. The bending along the lines 16 causes stiffening of the zone 26 relative to the intermediate triangular zone 20, whereby these two zones are located so as to be substantially co-planar. Also the zones 28 and the corresponding zones 18 are stiffened, thus defining lateral generally triangular zones. The bending on the lines 5 and on the lines 14 and the above-described stiffening of the zones 26, 20, and 28, 18, gives the final operative condition of the razor, as illustrated in Figs. 9, 10, 11 and 12, the construction passing through the conditions shown in Figs. 7 and 8. In the final operative condition, the zones 3 and 12 form a handle or grip having a double thickness in comparison with the thickness of the blank 1, and the stiffened zones 18, 28 form inclined diverging walls which are joined to the intermediate triangular wall formed by the zones 20 and 26 which are stiffened relative to each other and are inclined with respect to the handle or grip. The blade holder formed by the zones 30 and 32, is disposed so as to project perpendicularly to the zone formed by the portions 20 and 26. Therefore the plane of the blade 37 is inclined, as shown in Figs. 9, 10 and 11, relative to the development of the handle or grip formed by the zones 3 and 12. This makes it possible to utilize the razor for shaving in conventional manner. It is to be

noted that with the bending of the zones 32 and 30, one achieves the disposition of the cutting edge of the blade as visible in Fig. 16, i.e. in correspondence of the window 36 and of windows 42.

After use, the razor may be put away, to be used again, unless a non-replaceable single-use blade is provided.

The razor can be folded to a storage configuration in which it occupies a very small space and has the blade protected against accidental contact therewith, for instance prior to use in the case of a disposable embodiment, or as may be desired in the case of an embodiment having a replaceable blade. For this purpose, one starts with the blank in the condition shown in Figs. 6 and 15, and folds the blade holder 30, 32 and the zone 26 around the transverse bending line 22 until the zone 32 lies against the zones 18, 18, as shown in Fig. 18. As a result, the zones 20 and 18 are stiffened and made coplanar. The assembly consisting of the portions 32, 30, 26, 20, 18, 18 is now swung around the bending line 9 and additional bending or folding is effected along the bending line 7, through the condition shown in Fig. 19, in such a manner as to attain the storage condition of Figs. 17 and 20, in which the rear surface of the zone 20 is laid down against the two zones 3, made rigidly coplanar by the bending along the line 7. Thus one contains a package as shown in Figs. 17 and 20, in which the blade 37 is fully protected and the razor is an extremely flat element of substantially reduced overall dimensions, suitable to be accommodated in a pocket of a suit. This is a remarkable advantage of the described embodiment in comparison with known conventional razors and disposable razors, which occupy much more space than the present razor when folded as shown in Figs. 17 and 20. On the other hand, the changeover from the condition of Figs. 17 and 20 to the operative condition of Figs. 9, 10 and 11 is very easy, the configuration passing from the form shown in Fig. 20 through the forms of Figs. 19, 18, 6, 7 and 8, to reach the operative condition of Figs. 9 to 11. The razor is stabilised in this condition by the engagement of the pegs 48 and 52 into the openings 50 and 54.

Figs. 21 and 23 illustrate, after fitting of the blade thereof, embodiments in which the portions which in the previous example are denoted by the numerals 30 and 26 have been made rigid during the moulding of the blanks. In these examples, the portions 130 and 126 (corresponding to the described zones 30 and 26) are moulded so as to be stiff and at an angle to each other either of 90° as shown in Figs. 21 and 22, or of an

obtuse extent as shown in Fig. 23, for moulding considerations.

Other arrangements may be provided to enable the operative condition of the razor to be achieved by bending a blank along longitudinal bending lines. One may provide, for instance, an embodiment wherein the longitudinal bending lines, such as the lines 5, may be joined by a substantially continuous curvature with the bending line extensions 16, thus eliminating the bending lines 14, the zones 12 and 18 being made symmetrical with respect to a longitudinal plane of symmetry plane and each zone 12 being developed without interruption with the contiguous zone 18. In this case the corner defined by the bending lines 14 is missing and there is a slight curvature of the zone replacing the zones 12 and 18, this zone being made in such a manner as to obtain a slight curvature instead of being typically rigid as in the preceding embodiment.

Fig. 24 shows a modification wherein the bending lines 5 are spaced apart by a strip 205, so that the cross section of the handle is triangular. Inclined laminar pegs 207 on one of the side zones engage into corresponding slots in the other side zone.

Other variations may be adopted within the scope of the invention as defined by the following claims.

WHAT I CLAIM IS:—

1. A safety razor comprising a substantially flat sheetform blank divided into substantially rigid zones by a plurality of bending lines which enable the blank to be folded from a flat condition into an operative condition for use, characterised in that said blank comprises a first portion which, in operative condition, forms a blade holder for holding a razor blade with a cutting edge of said blade protruding, and a further portion which, in the operative condition, forms a handle or grip of the razor, with said blade holder projecting in a stiffened position from said handle or grip.

2. A safety razor as claimed in claim 1 characterised in that said first portion of said blank can be folded to as to protect said blade holder in a storage condition of the blank.

3. A safety razor as claimed in claim 1 or 2 characterised in that said further portion of said blank comprises a substantially centrally-disposed triangular portion which connects by its base with said first portion of said blank, and elongate side panels which connect with one another along a simple or multiple bending line extending along the longitudinal centre line of said further portion and connect by inclined edges with respective angled sides of said triangular portion, whereby said elongate panels can



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noted that with the bending of the zones 32 and 30, one achieves the disposition of the cutting edge of the blade as visible in Fig. 16. i.e. in correspondence of the window 36 and of windows 42.

After use, the razor may be put away, to be used again, unless a non-replaceable single-use blade is provided.

The razor can be folded to a storage configuration in which it occupies a very small space and has the blade protected against accidental contact therewith, for instance prior to use in the case of a disposable embodiment, or as may be desired in the case of an embodiment having a replaceable blade. For this purpose, one starts with the blank in the condition shown in Figs. 6 and 15, and folds the blade holder 30, 32 and the zone 26 around the transverse bending line 22 until the zone 32 lies against the zones 18, 18, as shown in Fig. 18. As a result, the zones 20 and 18 are stiffened and made coplanar. The assembly consisting of the portions 32, 30, 26, 20, 18, 18 is now swung around the bending line 9 and additional bending or folding is effected along the bending line 7, through the condition shown in Fig. 19, in such a manner as to attain the storage condition of Figs. 17 and 20, in which the rear surface of the zone 20 is laid down against the two zones 3, made rigidly coplanar by the bending along the line 7. Thus one contains a package as shown in Figs. 17 and 20, in which the blade 37 is fully protected and the razor is an extremely flat element of substantially reduced overall dimensions, suitable to be accommodated in a pocket of a suit. This is a remarkable advantage of the described embodiment in comparison with known conventional razors and disposable razors, which occupy much more space than the present razor when folded as shown in Figs. 17 and 20. On the other hand, the changeover from the condition of Figs. 17 and 20 to the operative condition of Figs. 9, 10 and 11 is very easy, the configuration passing from the form shown in Fig. 20 through the forms of Figs. 19, 18, 6, 7 and 8, to reach the operative condition of Figs 9 to 11. The razor is stabilised in this condition by the engagement of the pegs 48 and 52 into the openings 50 and 54.

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obtuse extent as shown in Fig. 23, for moulding considerations.

Other arrangements may be provided to enable the operative condition of the razor to be achieved by bending a blank along longitudinal bending lines. One may provide, for instance, an embodiment wherein the longitudinal bending lines, such as the lines 5, may be joined by a substantially continuous curvature with the bending line extensions 16, thus eliminating the bending lines 14, the zones 12 and 18 being made symmetrical with respect to a longitudinal plane of symmetry plane and each zone 12 being developed without interruption with the contiguous zone 18. In this case the corner defined by the bending lines 14 is missing and there is a slight curvature of the zone replacing the zones 12 and 18, this zone being made in such a manner as to obtain a slight curvature instead of being typically rigid as in the preceding embodiment.

Fig. 24 shows a modification wherein the bending lines 5 are spaced apart by a strip 205, so that the cross section of the handle is triangular. Inclined laminar pegs 207 on one of the side zones engage into corresponding slots in the other side zone.

Other variations may be adopted within the scope of the invention as defined by the following claims.

WHAT I CLAIM IS :—

1. A safety razor comprising a substantially flat sheetform blank divided into substantially rigid zones by a plurality of bending lines which enable the blank to be folded from a flat condition into an operative condition for use, characterised in that said blank comprises a first portion which, in operative condition, forms a blade holder for holding a razor blade with a cutting edge of said blade protruding, and a further portion which, in the operative condition, forms a handle or grip of the razor, with said blade holder projecting in a stiffened position from said handle or grip.

2. A safety razor as claimed in claim 1 characterised in that said first portion of said blank can be folded to as to protect said blade holder in a storage condition of the blank.

3. A safety razor as claimed in claim 1 or 2 characterised in that said further portion of said blank comprises a substantially centrally-disposed triangular portion which connects by its base with said first portion of said blank, and elongate side panels which connect with one another along a simple or multiple bending line extending along the longitudinal centre line of said further portion and connect by inclined edges with respective angled sides of said triangular portion, whereby said elongate panels can

overlie one another over part of their length when said blank is in the operative condition, and define, with said triangular portion, a head which supports said blade holder at an angle to the longitudinal direction of said handle or grip.

4. A safety razor as claimed in claim 3 characterised in that said first portion comprises a first transverse zone and a second transverse zone adapted to be folded, the one over the other, to form said blade holder, said second transverse zone being connected by a transverse connecting strip which, in the operative condition of said blank, is orthogonal to said second transverse zone and connects said blade holder to said triangular portion.

5. A safety razor as claimed in claim 4 characterised in that said transverse connecting strip is rigidly located relative to said blade holder.

6. A safety razor as claimed in claim 4 characterised in that said transverse connecting strip is crossed by an angled pair of bending lines which define said angled

portion, so that bending of said blank on said pair of bending lines serves, in the operative condition of the blank, to stiffen said connecting strip and said triangular portion.

7. A safety razor as claimed in claim 2 characterised in that said further portion is formed with transverse bending lines which divide said further portion into protective zones which enclose and protect said blade holder in said storage condition of said blank.

8. A safety razor substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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