

Nov. 16, 1971

P. A. BRAGINETZ

3,619,901

RAZOR WITH FLEXIBLE BAND BLADE

Filed Sept. 29, 1969

3 Sheets-Sheet 1

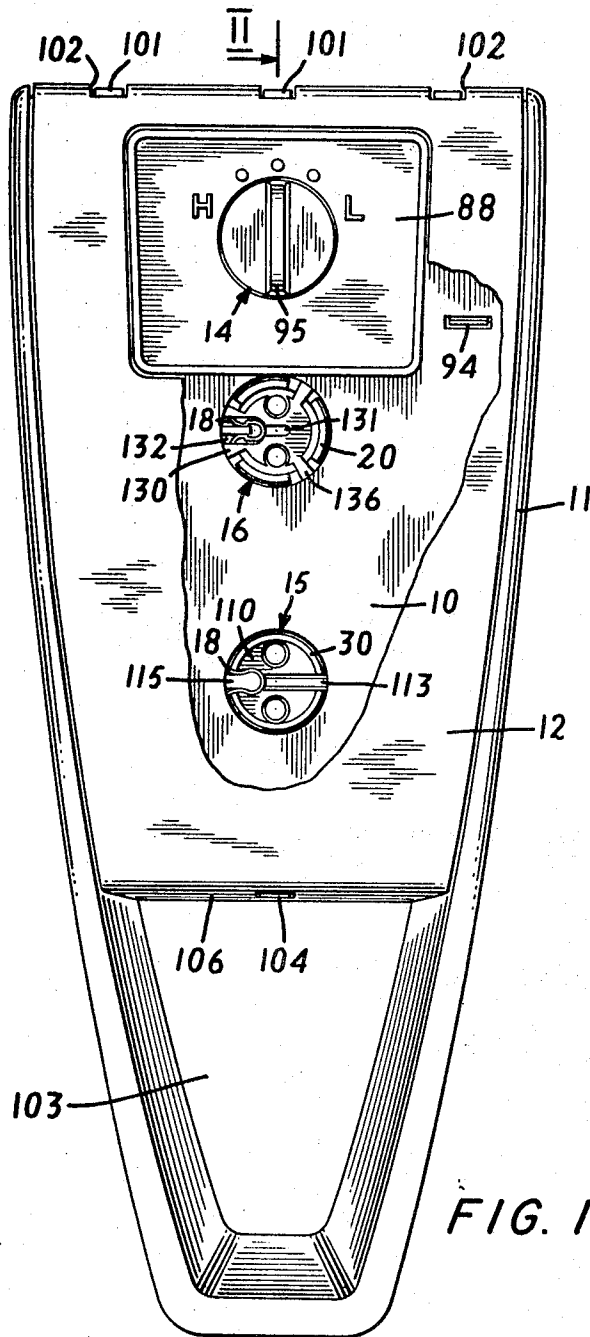


FIG. 1

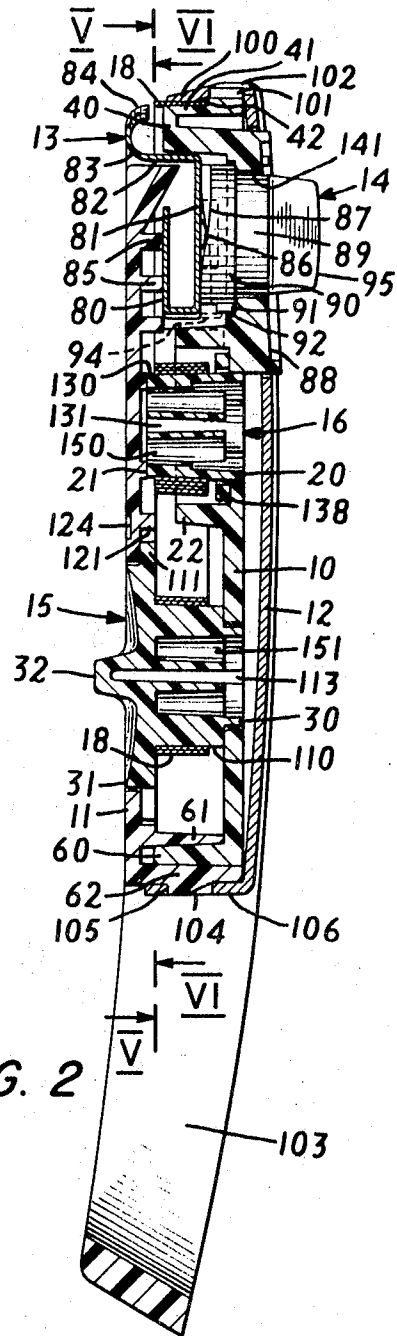


FIG. 2

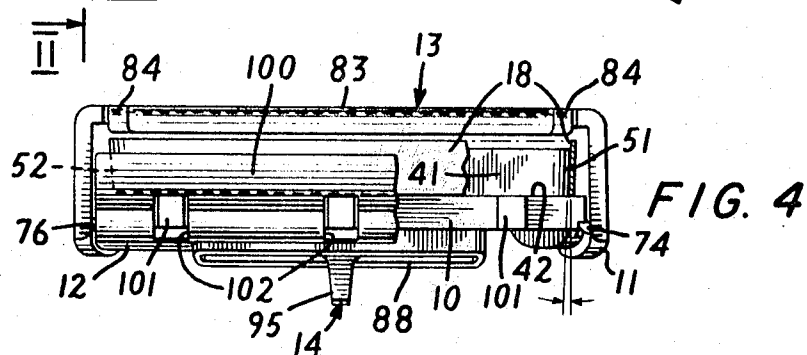


FIG. 4

RAZOR WITH FLEXIBLE BAND BLADE

Filed Sept. 29, 1969

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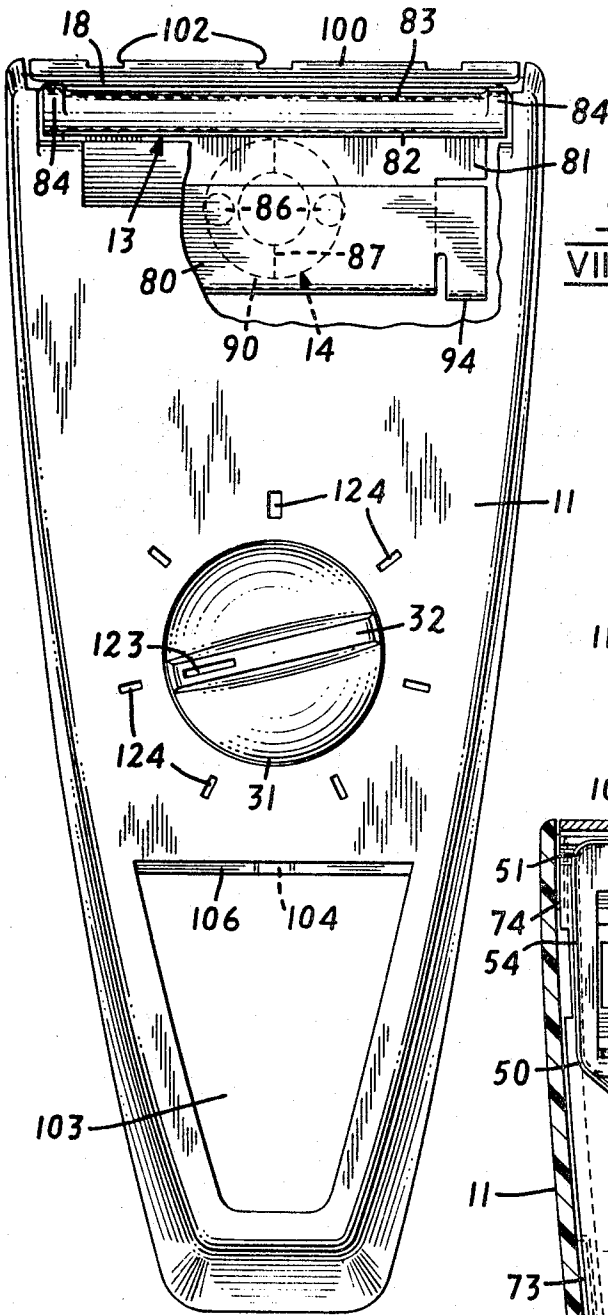


FIG. 3

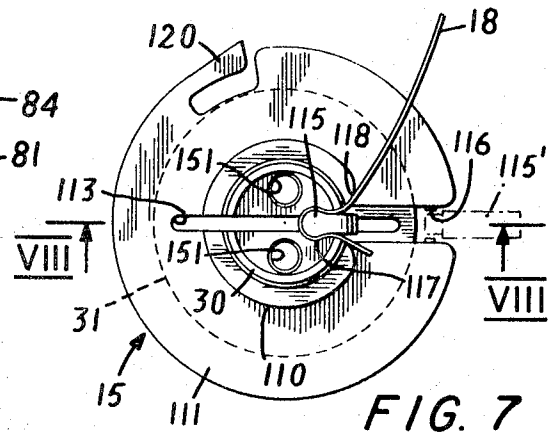


FIG. 7

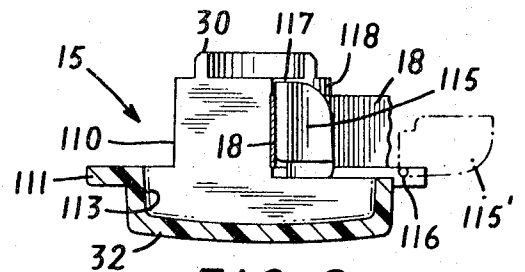


FIG. 8

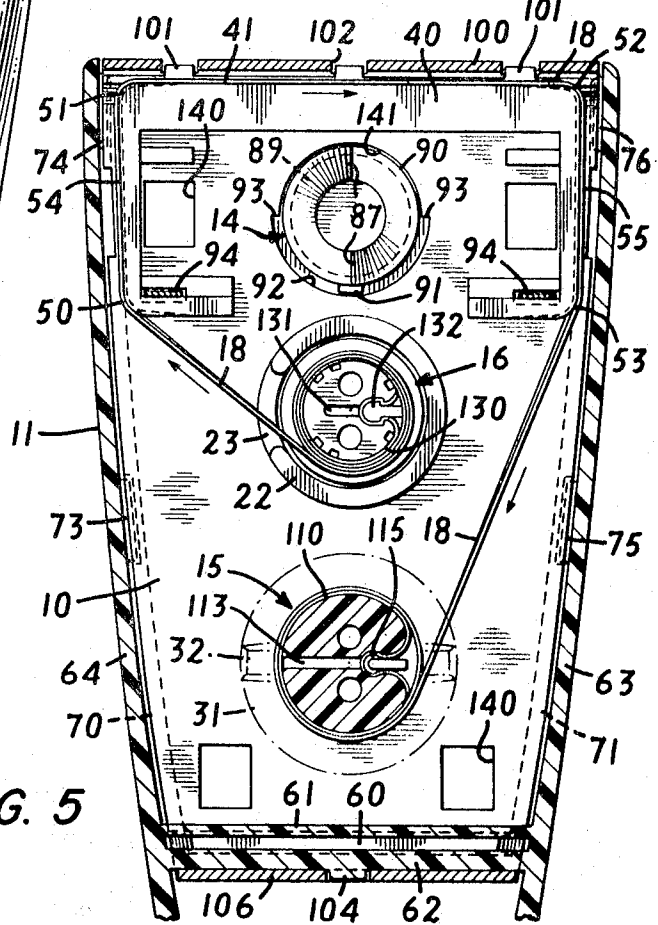


FIG. 5

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FIG. 6

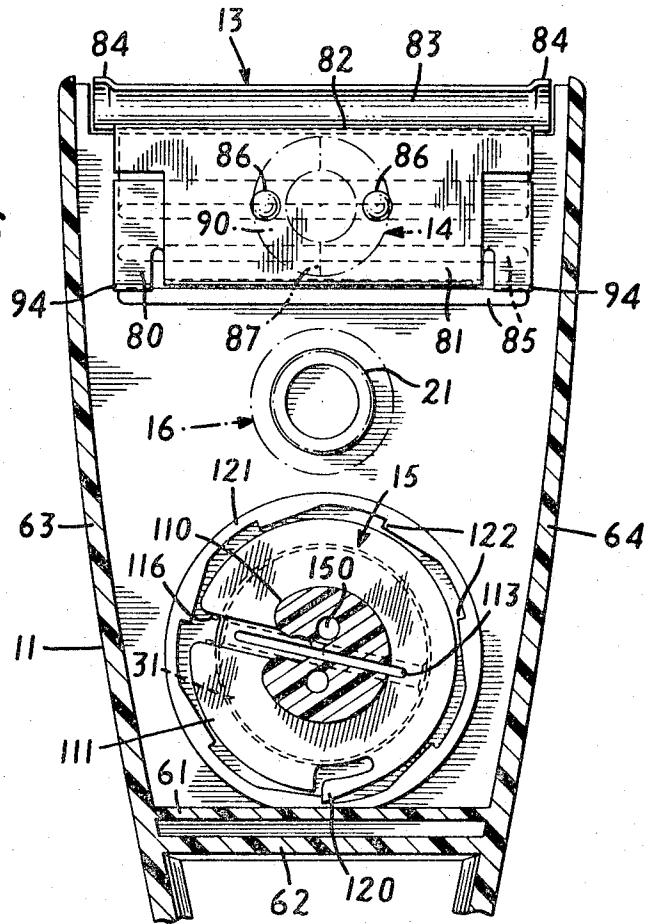


FIG. 9

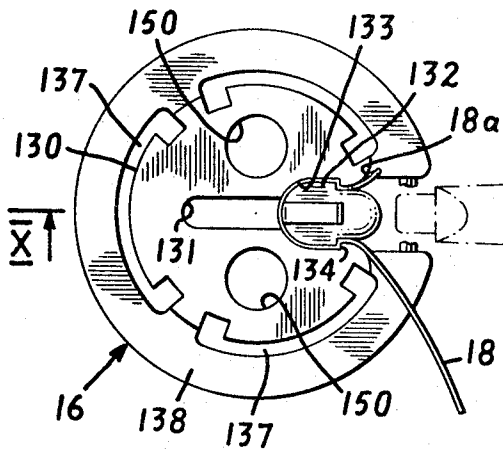
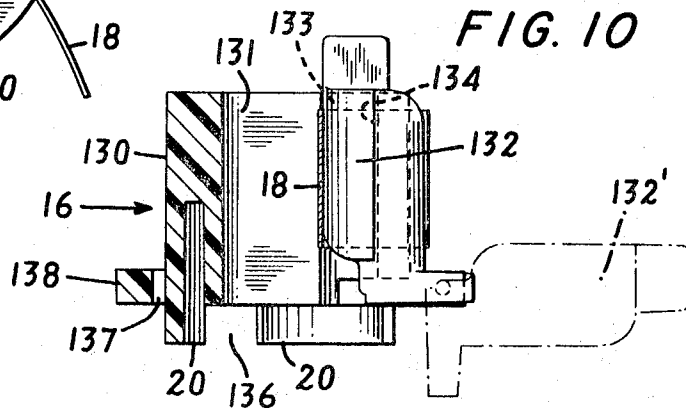


FIG. 10



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RAZOR WITH FLEXIBLE BAND BLADE

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Filed Sept. 29, 1969, Ser. No. 861,659

Int. Cl. B26b 21/26

U.S. Cl. 30—40.1

9 Claims

ABSTRACT OF THE DISCLOSURE

A disposable razor of the flexible band blade type in which the band is adapted to be incrementally and progressively advanced through the shaving area from a pay off spool to a manually rotatable take up spool, the operative elements being mounted in an inner frame, which is contained in a pocket in a cover member elongated to serve as a combined casing and handle, the pocket being formed by side flanges and transverse ribs, the razor having also a back plate extending over the frame and having a flange interlocked with a transverse rib of the front casing part, the razor further embodying a bridge member of elastic sheet material having a U-shape in cross-section and carrying a guard, the position of the guard being adjustable through cam means acting to compress elastically the guard carrying leg of the U-shape relative to the other leg.

THE PRIOR ART IN GENERAL

Razors of the type embodying a thin narrow flexible blade adapted to be advanced in successive steps to position successive portions at the shaving area are well known in general in the prior art and in one form at least embody a pay off reel or spool upon which the band is initially wound and a take up reel or spool manually rotatable to advance the band over the supports at the shaving area. Representative early patents showing this type of razor include Mergenthaler 973,533, Jones 2,492,292 and Delafontaine et al. 2,729,886. More recent patents disclosing forms of this type generally similar to the so-called band or ribbon blade razors available commercially are Nissen 3,262,198 and 3,364,571.

GENERAL DESCRIPTION OF THE PRESENT INVENTION

The present flexible band blade razor which, considering particularly that it embodies an adjustable guard, is marked by relative simplicity of design with a minimum of parts and a convenience of assembly whereby it may be economically manufactured and sold as a complete but disposable razor. Structurally it embodies three major elements comprising an inner frame in which are mounted the operating elements, a cover member which because of its shape and arrangement serves as a combined main casing and handle adapted to be conveniently nested in the hand, and a back cover plate.

The main cover member has side flanges and cross ribs forming a pocket in which is mounted the frame member which carries the rotatable spools for the band blade and guide surfaces therefor including the blade supporting platform at the shaving area. Of particular advantage is the character of the bridge member which carries the guard and is likewise mounted in the main frame, the guard being adjustable through means which will be more fully described hereinafter. The back cover comprises a simple plate which is easily snapped into position as a final step in the assembly.

Other details, features and advantages will be made apparent from a consideration of a representative embodiment of the invention as described hereinafter and depicted in the drawings in which:

FIG. 1 is a rear view in elevation with a portion of the back plate broken away;

FIG. 2 is a cross-sectional view taken on the plane II—II of FIG. 1;

FIG. 3 is a front view with an upper portion of the front cover broken away to show the bridge element;

FIG. 4 is a top plan view looking downwardly on FIG. 1;

FIG. 5 is a cross-sectional view taken on the plane V—V of FIG. 2 and accordingly with the front cover broken away to show the inner frame member;

FIG. 6 is a cross-sectional view taken on the plane VI—VI of FIG. 2 and accordingly looking at the rear surface of the front cover;

FIG. 7 is a view in plan of the take up spool for the razor band;

FIG. 8 is a vertical cross-sectional view taken on the plane VIII—VIII of FIG. 7;

FIG. 9 is a plan view of the pay out spool for the razor band; and

FIG. 10 is a vertical cross-sectional view taken on the plane X—X of FIG. 9.

The principal elements of the band razor comprise a main frame 10 shown particularly in FIG. 5, a casing and front cover member 11 shown in elevation in FIG. 3; a rear cover plate 12 shown in elevation in FIG. 1 except where broken away to show the inner frame 10, a bridge member 13 shown best in elevation in FIG. 3, a bridge adjusting button 14 shown in FIGS. 1 and 2, a take up spool 15 shown as a separate element in FIGS. 7 and 8, and a pay out spool 16 shown as a separate element in FIGS. 9 and 10. The razor band is indicated at 18.

The various working elements are each mounted in part at least in the frame 10. As indicated particularly in FIGS. 1 and 2 the pay out spool 16 has a rear hub portion 20 fitted in an opening in the frame 10 and the front portion bears against an annular rib 21 in the rear face of the cover member 11. As shown particularly in FIG. 5 the front face of the frame 10 has an annular cup shaped projection 22 within which the pay out spool and the band 18 wound thereon are located, the cup shaped member 22 having an opening 23 through which the band 18 may be withdrawn.

Also mounted in the frame 10 is the take up spool 15 having a rear cylindrical bearing portion 30 adapted to fit closely in an opening in the frame 10 the take up spool having also an enlarged cylindrical portion 31 mounted in a bearing opening in the front casing 11 as shown particularly in FIG. 2, the spool being provided with a transverse rib 32 adapted to be gripped by the fingers for rotation of the spool to advance the razor band. Further details of the take up spool will be described in connection with FIGS. 7 and 8.

The forward face of the frame 10 is provided with an upper generally rectangular projection 40 around three sides of which the razor band is adapted to be entrained as shown particularly in FIG. 5. The projection 40 includes an upper flat supporting platform 41 shown particularly in FIGS. 2 and 5 with a rear shoulder portion 42 against which the back edge of the band is adapted to engage. The band in its advance travels over the four corners 50, 51, 52 and 53 as indicated in FIG. 5. These four corners, and likewise the supporting surface 41, the plane guide surface between the corners 50 and 51 and the guide surface 55 between the corners 52 and 53 are inclined inwardly to the rear, that is they comprise in effect a section of a pyramid with the apex at an imaginary point at the rear as viewed in, for example, FIG. 2. As a result the guide corners are correspondingly inclined, this being apparent for the corners 51 and 52 as viewed in FIG. 4. Accordingly the arrangement insures that the

rear edge of the blade will be maintained against the shoulder 42.

The casing 11 is applied over the frame 10 and located and secured by suitable means. In the present embodiment the frame 10 has a bottom flange 60 adapted to engage between a pair of ribs or flanges 61 and 62 of the casing 11 as shown particularly in FIG. 2. The frame 10 in general is fitted between the side flanges 63 and 64 of the casing. As indicated particularly in FIG. 5 the frame 10 at each side edge is provided at its rear face with raised ribs 70 and 71 respectively. Also as indicated particularly in FIG. 5 the flange 64 of the cover casing is provided with two inwardly projecting lugs 73 and 74 and correspondingly the flange 63 is provided with the lugs 75 and 76. The frame 10 is provided with notches at its side edges complementary to the respective lugs 73, 74, 75 and 76. The transverse distances between the side flanges 63 and 64 of the casing 11 in relaxed condition are slightly less than the width of the frame 10 at the corresponding areas. Accordingly by springing outwardly the flanges of the cover frame 10 may be inserted in the pocket in the casing 11 and the lugs 73, 74, 75 and 76 snap into the complementary notches of the frame and securely retain it therein.

Prior to the assembly of the casing over the frame 10 the button 14 is inserted in its bearing in the frame and there is then mounted within the rectangular projection 40 of the frame shown in FIG. 5 the bridge element 13 as shown in FIG. 3 and in cross section in FIG. 2. The bridge member is made of spring steel and is U-shaped in cross section with a front upturned flange or panel 80, a rear main flange or panel 81 and an upper portion 82 extending at right angles to the rear panel 81, the portion 82 including a rounded portion 83 serving as a guard with respect to the blade 18. The guard 83 preferably has enlargements 84 at each end to avoid scratching of the skin by the blade at the ends of the shaving area. The forward panel section 80 bears against a pair of ribs 85 on the inner rear face of the cover 11. The rear panel section 81 has a pair of spaced raised elements in the form of dimples 86 (FIG. 6) adapted to be engaged by the rotary bridge adjusting button 14. The button 14 has a pair of inclined cam surfaces 87 for engagement with the respective dimples 86. The button 14 extends through an opening in a rear rectangular boss portion 88 of the frame 10 serving as a bearing for the cylindrical portion 89 of the button of reduced diameter. The button also has an inner enlarged cylindrical portion 90 which limits the outward movement of the button. A radially extending finger or lug 91, shown in cross-section in FIG. 5, operates in an annular groove 92 with limiting end shoulders 93. Preferably the bridge member has a pair of spaced fingers 94 located at the ends of the bottom portion which engage in slots in the frame 10. Since the forward panel 80 is rigidly restrained by the stop ribs 85, rotation of the button 14 varies the position of the rounded guard member 83 in the horizontal direction relative to the blade cutting edge the rear plate member 81 being maintained in engagement through the dimples 86 with the cam surfaces on the knob 14 due to the inherent elastic force of the bridge member. As shown in FIG. 1 the rear boss 88 of the frame 10 has suitable indicia which in conjunction with the finger rib 95 on the button 14 indicate the setting of the guard 83 the indicia including the marks "H" and "L" to indicate heavy shave and light shave with selected variations in the closeness of the shave at intermediate settings. The button 14 is limited in its rotation to slightly less than 180°.

The back plate 12 which is the last part to be assembled is shaped as indicated in cross-section in FIG. 2 having an upper flange 100 engaged over and adapted to bear down on the razor band 18. The bracket 10 is provided at its top surface rearwardly of the shoulder 42 with spaced lugs 101 (FIG. 4), three being shown in the present embodiment and the flange 100 of the back plate has

complemental openings 102. In assembly the upper end of the back plate is hooked over the top of the razor with the lugs 101 projecting into the holes 102 and the lower end of the back plate is swung toward the bracket into the opening 103. Within the opening the bottom flange 62 of the cover 11 is provided with a cam shaped lug 104 having a straight shoulder 105 and the flange 106 of the back plate has an opening adapted to snap over the lug 104 for securing it in locked position. As appears in FIG. 1 the back plate 12 has a rectangular opening adapted to receive and frame the rear boss 88 of the frame 10.

The assembled razor, as defined particularly by the combined casing and handle member 11 which has the pocket for the frame 10 and a narrowed extension embracing the opening 103, comprises a relatively elongated device somewhat curved in side elevation as shown in FIG. 2. It is light weight and fits comfortably in the hands of the user. The parts may be made of various materials but advantageously the frame 10 and the casing member 11 are of molded plastic and the back plate 12 is of sheet metal.

Details of the take up spool 15 will now be described in connection particularly with FIGS. 7 and 8. The spool is preferably molded in one piece of suitable plastic material which has substantial resilience and elasticity such as the material sold under the trade name CELCON which is a copolymer acetyl resin. The spool includes a generally cylindrical body portion 110 on which the razor band is wound from which extends the cylindrical bearing portion 30 heretofore referred to. Formed integrally is the enlarged flange portion 111 which includes the cylindrical portion 31 adapted to be received and supported in the casing cover 11 as shown particularly in FIGS. 2 and 3. The cylindrical portion 31 carries the transverse rib 32 for manual rotation of the spool. The spool is provided with a radial slot 113 which extends through the axis and to the periphery of the spool as shown particularly in FIG. 7 at the right but does not extend axially through the finger rib 32. The razor band is adapted to be secured within the slot 113 and wound around the cylindrical portion 110. The end of the razor band may be secured in the spool in various ways, the particularly advantageous means here disclosed is the subject matter of a separate application by Thomas F. Bombero filed Sept. 29, 1969, Ser. No. 861,644 but will be described herein to some extent to show its relation to the razor as a whole. Cast integrally with the spool is a locking member 115 shown in final position in FIGS. 7 and 8 in full lines and in the initial position as cast in broken lines at 115', it being connected to the flange portion 111 of the spool by slender web portions 116. The slot 113 has an outer enlarged opening 117 and a tapered or rounded entrance portion 118 the enlarged portion 117 being defined by opposed arc-shaped depressions. The locking member 115 has a complementary shape and in assembling, assuming the end of the razor band to be located between the locking member 115 and the slot, the locking member is swung up from the broken line position indicated at 115' into the final position shown in FIGS. 7 and 8. In advancing the locking member the band is wrapped around the forward face thereof and the locking member and band are forced into the position shown. It will be appreciated that because of the character of the plastic material and the presence of the slot 113 the halves of the cylindrical portion 110 may be temporarily wedged apart to receive the blade and the locking member 115. In forcing the locking member 115 into the final position the connecting web portions 116 are broken. In the operation of the spool to advance the razor band the end of the band remains firmly locked in the spool by reason of the fact particularly, as heretofore described, that the annular bearing portion 30 is snugly but rotatably fitted in a bearing opening in the frame 10 which prevents the halves of the spool from spreading and releasing the razor band.

The take up spool is adapted to be rotated in the razor band advancing direction only and in this respect, as shown in FIGS. 6 and 7, the flange portion 111 is provided with a flexible latching finger 120 and the inner face of the cover 11 is provided with an annular raised rib 121 as shown in FIG. 6 having internal ratchet teeth 122 whereby the spool may be rotated counter clockwise in FIG. 6 which corresponds to clockwise rotation in FIG. 3. Suitable indicia are provided for indicating the successive rotational steps including the marking 123 on the finger piece 32 and angularly spaced position markings 124 on the cover. The amount of advance of the band in the successive rotational steps of the take up spool may vary dependent upon preferences and various other factors. In the present embodiment of the razor rotation of the spool from one of the markings 124 to the next marking advances the band $\frac{1}{7}$ of the exposed cutting blade length which results in what may be termed incremental shaving, and successive advances through the seven positions advances the blade for the full length of an exposed cutting area. If a full new band section is desired at each advance this of course can be effected by a complete 360° rotation of the spool.

The pay out spool will now be described, which may be made of similar plastic material but differs from the take up spool in certain details as to the manner of initially fastening the end of the band in the pay out spool. Referring to FIGS. 9 and 10 the spool has a cylindrical portion 130 on which the blade is wound and which similarly to the take up spool has a transverse slot 131 extending to the periphery at one side and in this case for the whole axial length of the spool. Cast integrally with the pay out spool is the locking finger 132 shown in full line in locking position in FIGS. 9 and 10 and as initially cast integrally with the spool in broken lines at 132'. For reasons which will be discussed shortly, the locking member and the slot are shaped in the case of the pay out spool with a more positive locking means for the end of the razor band. As indicated in FIG. 9 the outer enlarged portion 133 of the slot 131 is provided with opposed shoulders 134 and the locking member 132 has a complementary shape with corresponding shoulders. The flexibility of the plastic together with the presence of the slot 131 permit the opposed halves of the cylindrical part 132 to be temporarily spread apart as the locking member and the entrained band end are forced into the position shown in FIG. 9 and automatically assume the positive locking position there shown. As an added security against release of the band, particularly in initially winding the band on the spool before the hub portion 20 is inserted in the frame 10, the band may be provided with a pair of protuberances 18a near the end. The protuberances may be formed in any convenient manner as by a sharp pointed punch or by lancing. The hub portion 20 previously described is interrupted by open notches 136 whereby it is formed of three arc-shaped projections and by reason of the arc-shaped openings 137 in the flange 138 they are free to flex radially. The diameter of the cylindrical portion defined by the arc-shaped members 20 is appreciably larger than the diameter of the bearing opening in the frame member 10 and accordingly when mounted as shown in FIG. 2 the rotation of the pay out spool is resisted by a substantial amount of friction maintaining the band in tension free of looseness or over-run.

The assembled construction has been described in detail. Various steps may be resorted to in accomplishing the assembly some of which have been described. Certain other steps of interest will be described particularly in initially assembling the elements in the frame 10. It will be noted from FIG. 5 that the frame 10 has four corner openings 140 and in the initial operation of assembling the elements the frame is placed with the front face upward as shown in FIG. 5 on a support having four locating studs which enter the openings 140. The cam

button 14 is inserted in the opening 141 with the cam surface upward. Next the bridge member 13 is applied and positioned as shown in FIG. 3. The end of the razor band is secured in the pay out spool which is positioned within the chamber formed by the annular rib 22 of frame 10, the interrupted cylindrical bearing portion 20 being entered into its bearing support in the frame. The other end of the razor band is secured in the take up spool 15 and the interrupted annular portion 30 inserted in its bearing support in the frame 10. In the course of the operations the band is trained from the pay out spool around the supporting surfaces comprising the side guide surface 54, the top platform surface 41, and the side guide surface 55 to the take up spool 15, the final position being shown in FIG. 5. After attachment thereto the band is wound on the pay out spool by manual rotary means at the rear having a pair of rods or fingers inserted in the holes 150 of the spool. The take up spool 15 in assembling the razor may be similarly rotated through fingers inserted in the holes 151.

Various changes may be made in the razor described and disclosed in the drawings and different embodiments of the invention may be made without departing from the principles thereof and accordingly it is intended that all matter contained herein shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A razor completely disposable as a whole embodying a flexible band blade, having a main frame with a band pay out spool and a band take up spool mounted therein, an elongated casing including side flanges and a transverse flange intermediate the top and bottom ends of the casing said flanges defining a pocket portion at the upper end of the casing within which is mounted said frame, interengaging lug means for locking the frame in the casing, said side flanges each having a lower extension integral therewith extending downwardly a sufficient distance whereby the casing including said pocket portion and said side flange extensions afford ample handle area for hand grasping in shaving.

2. A razor in accordance with claim 1 in which said casing has a pair of cross members spaced from each other to form a slot in which is engaged a frame transverse flange.

3. In a razor embodying a flexible band blade, a main frame with a band pay out spool and a band take up spool mounted therein, and said main frame having an upper blade supporting platform, an elongated casing having a front wall and side flanges and a transverse flange intermediate the top and bottom ends of the casing defining a pocket portion at the upper end of the casing within which is mounted said frame, said side flanges each having a lower extension integral therewith, and said side flanges being inclined inwardly toward each other forming a smooth sided constantly tapering handle portion to the extreme lower end of the casing, and said side flanges extending downwardly a sufficient distance whereby the casing including said pocket portion and said side flange extensions afford ample handle area for hand grasping in shaving.

4. A razor in accordance with claim 3 which includes a back cover plate of flexible sheet material having a top transverse flange engaged over said blade at said blade supporting platform and a bottom flange flexibly snapped over said casing transverse flange.

5. In a razor having a frame with a blade supporting platform and a blade mounted thereon, and a casing for said frame having a front wall; a bridge member mounted in said frame adjacent said platform and the blade, said bridge member being composed of elastic sheet material having a generally U-shape in cross-section with a front panel engaged against the inner wall of said casing, and a rear panel having at its upper edge a blade guard extending parallel to the blade cutting edge; and a rear cam means adjustable to engage and swing the rear panel

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forward to vary the location of said guard relative to the blade cutting edge, the bridge panels being elastically compressed toward each other between said casing wall and said cam means.

6. A razor in accordance with claim 5 in which said bridge member is composed of spring metal.

7. A razor in accordance with claim 5 in which said bridge member is nested in a pocket in said frame facing said casing.

8. A razor in accordance with claim 5 in which said cam means comprises a manually rotatable button mounted in said frame with forward cam surfaces engaged against the said rear panel of the bridge member.

9. A razor in accordance with claim 8 in which the forward face of said button has a pair of cam surfaces progressing spirally in the direction of the axis of the button and the rear panel of said bridge member has a pair of raised elements arranged to engage the respective said cam surfaces, and stop means associated with said

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button arranged to limit the rotation of said button to not more than 180° to limit the rotation of each cam surface to maintain contact with its respective raised element.

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U.S. Cl. X.R.

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