June 14, 1932. W. BARSCH 1,863,431

DEVICE FOR SHARPENING THE BLADES OF SAFETY RAZORS

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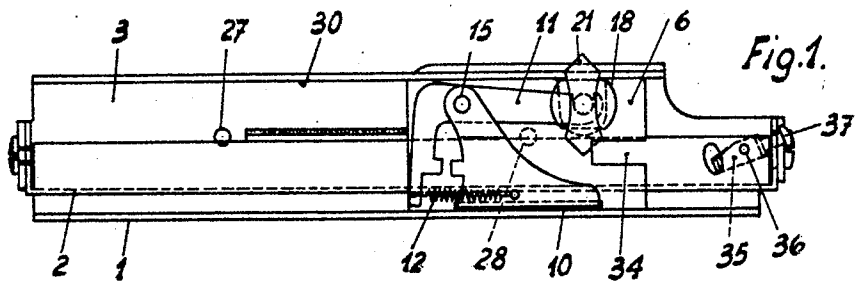


Fig. 1.

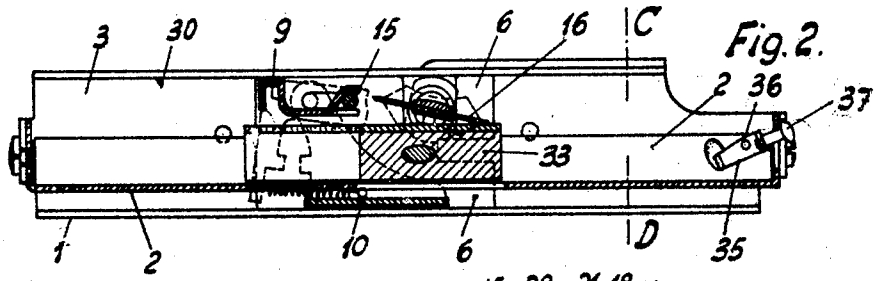


Fig. 2.

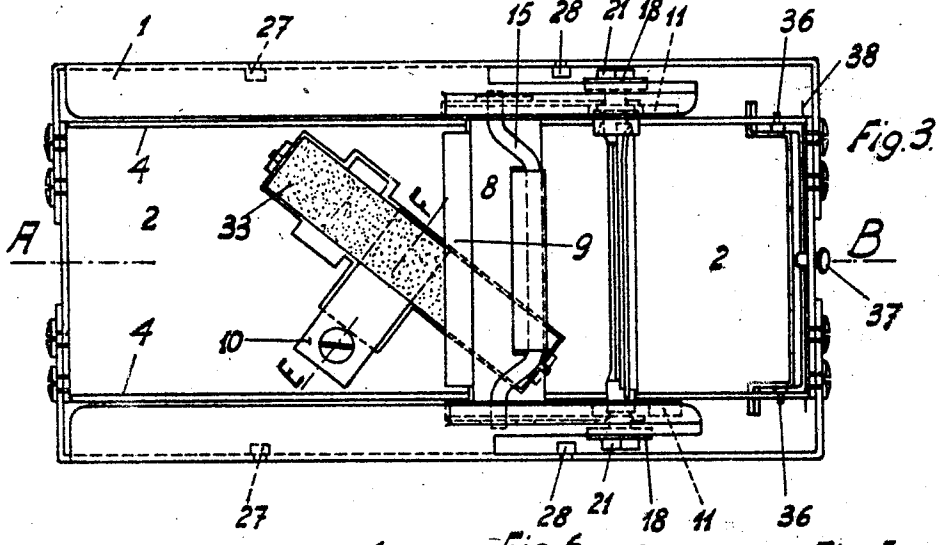


Fig. 3.

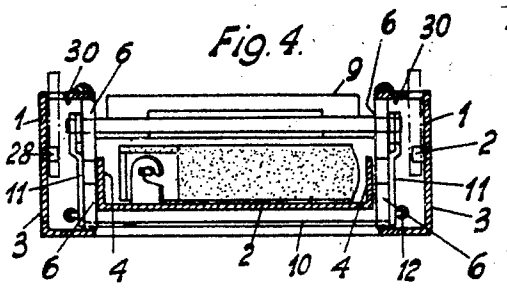


Fig. 4.

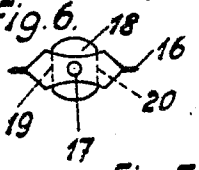


Fig. 6.

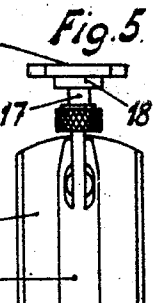


Fig. 5.

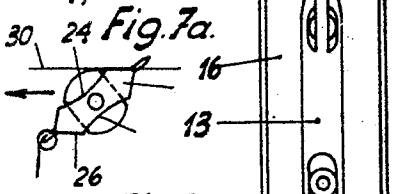


Fig. 7a.

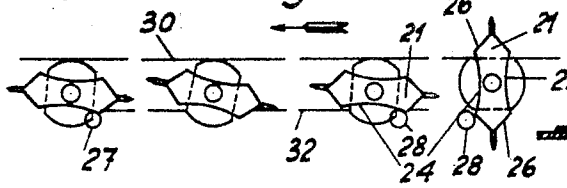


Fig. 7.

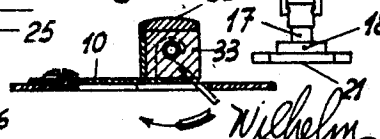


Fig. 8.

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DEVICE FOR SHARPENING THE BLADES OF SAFETY RAZORS

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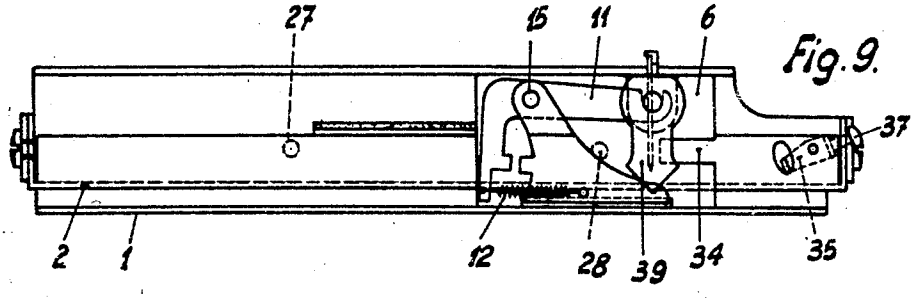


Fig. 9.

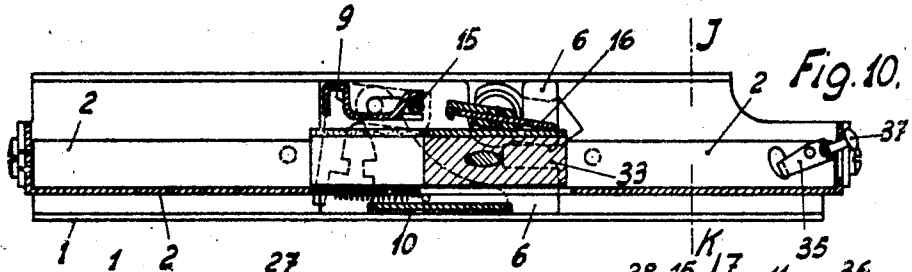


Fig. 10.

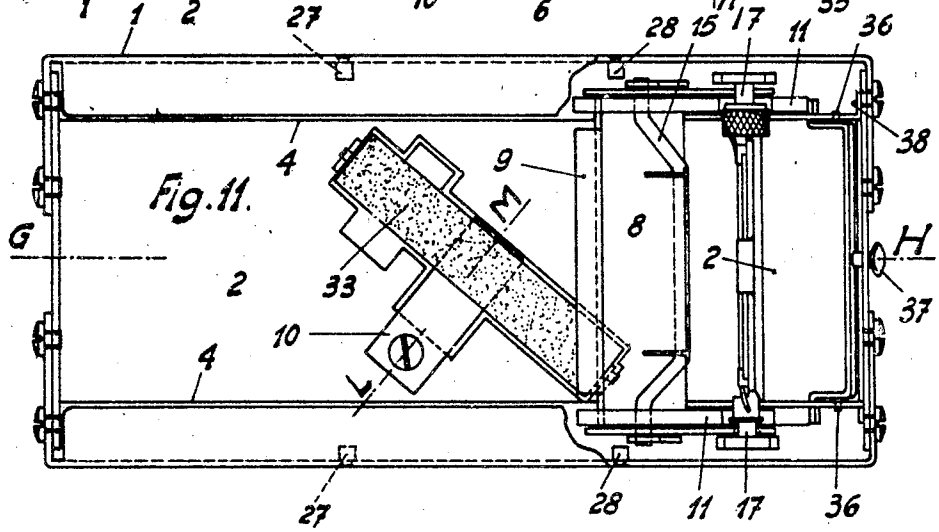


Fig. 11.

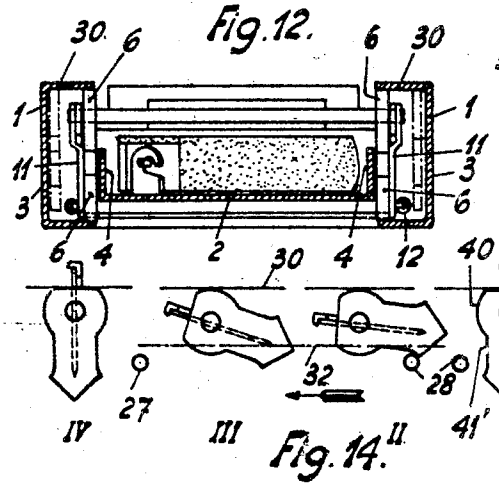


Fig. 12.

Fig. 14.

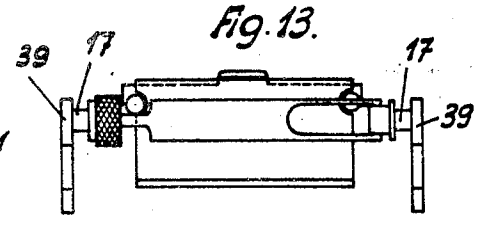


Fig. 13.

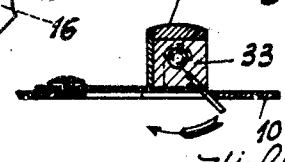


Fig. 15.

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UNITED STATES PATENT OFFICE

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DEVICE FOR SHARPENING THE BLADES OF SAFETY RAZORS

Application filed July 15, 1927, Serial No. 206,095, and in Germany September 29, 1926.

The present invention relates to a device for sharpening the blades of safety razors, such as described in Letters Patent 1,399,241 issued to me on December 6th, 1921.

In devices of this kind, the blade is moved across the sharpening body by means of a carriage slidably mounted in a frame, the blade being turned or tilted after each stroke, so as to bring successively each side of each cutting edge in contact with the sharpening body. At one end of the stroke the blade slides off and on the sharpening body and it is thereby guided by a roller. It was found however that through improper use of the device the blade might cut into the roller with resulting damage to the latter and to the blade.

The principal object of the invention therefore is to provide means which will automatically reverse the blade and guide it off and on the sharpening surface without the possibility of injuring the blade or any other part of the device. Another object of the invention is to provide means whereby the blade comes into contact with the sharpening body exactly at the moment when blade and sharpening surface form the proper angle for the most efficient sharpening.

With the above and other objects in view the invention resides in the parts and in the combination of parts hereinafter described and particularly set forth in the claims appended hereto.

In the drawings, in which I have shown by way of example two embodiments of my invention,

Fig. 1 is a side view of the device with part of the frame removed,

Fig. 2 is a longitudinal section of the device on line A—B of Fig. 3,

Fig. 3 is a plan view of the device,

Fig. 4 is a cross section on line C—D of Fig. 2,

Fig. 5 is a view of the blade-holder with inserted blade,

Fig. 6 is a detail view of the blade operating elements,

Fig. 7 is a series of views showing the blade operating elements in successive positions during one stroke,

Fig. 7*a* is a detail view showing the blade operating lever in a certain position,

Fig. 8 is a detail section on line E—F of Fig. 3,

Fig. 9 is a side view of a modified form of the invention, for use with single edge blades with part of the frame removed,

Fig. 10 is a section on line G—H of Fig. 11,

Fig. 11 is a plan view of the modified form of the device,

Fig. 12 is a section on line J—K of Fig. 10,

Fig. 13 is a view of the blade-holder with inserted blade,

Fig. 14 is a series of views similar to Fig. 7,

Fig. 15 is a detail section on line L—M of Fig. 11.

In the device illustrated by Figures 1–8, 1 indicates two longitudinal side frames of U-shaped cross-section. Between these frames and fastened thereto at each end extends a plate 2 with raised side portions 4, which serve as guides, for slides 6 of a movable carriage 8. The two slides 6 are rigidly connected with each other at the top by means of a cross piece 9 and at the bottom by a bridge 10. The cross piece 9 is shaped to serve as a handle for moving the carriage 8 to and fro. A lever 11 is pivotally mounted at 15 upon each slide 6. Springs 12 tend to swing the horizontal arms of levers 11 upward. The free ends of these horizontal arms are provided with notches to receive the blade-holder 13. The latter comprises a clamp to tightly hold the blade 16. At each end, the blade-holder is provided with round pieces 17, engaging the notches of levers 11 and with disks 18 having flats 19, 20 perpendicular to the plane of the blade. The blade-holder has also at each end a double armed lever 21 having concave guide surfaces 24, 25 symmetrical to each other with respect to the plane of the blade. The ends of the levers 21 are pointed as at 26. The levers 21 cooperate with abutments 27, 28 of the side frames 1 as will be described hereinafter.

To insert a blade the carriage is moved to the right-hand end (Fig. 1) as hereinafter

described and after a blade has been inserted into the blade-holder, the latter is placed into the notches of arms 11 and the carriage moved back. The disks 18 immediately engage the upper flanges 30 of frames 1 which form races and against which the disks are pressed by the action of the springs 12. The blade-holder being free to turn in its supports, the disks 18 roll on the flanges 30 until flats 19 or 20 come in contact with the flanges. The blade 16 is then in the vertical position, as shown in Fig. 1 and Fig 7[I]. When the carriage is moved further to the left, Fig. 7, the levers 21 engage the abutments 28 and hence the blade is tilted to the horizontal position (Fig. 7[II]). The cutting edge of the blade is thereby lifted above the surface 32 of the sharpening body 33. When the pointed end 26 of lever 21 slides off the abutment 28, the cutting edge of the blade is gradually placed upon the surface 32 at the proper angle for efficient sharpening. The carriage being moved further to the left, the friction of the round portions 18*a* of disks 18 and the race flanges 30 insures a constant pressure of the edge of the blade 16 against the surface 32 of the sharpening body (Fig. 7[III]). To obtain better results, the latter is placed at an angle to the path of the carriage (Fig. 3). Shortly before the end of the stroke of the carriage, the concave guide surface 24 of lever 21 engages the abutment 27 and the blade-holder is turned and the blade lifted from the surface 32 (Fig. 7[IV]). In its extreme position to the left, the carriage abuts against a cross-connection of the frames 1. The lever 21 is then still in engagement with abutment 27.

The carriage movement is then reversed. As may be understood by looking at Fig. 7 the rolling of the round portions of disks 18 on flanges 30 will now tend to bring the other edge of the blade in contact with the sharpening surface 32. The lever 21 with its concave surface 24 still on abutment 27 will however oppose this movement until the pointed end 26 slides off the abutment 27 and gradually places the edge of the blade upon surface 32, in the same way as at the beginning of the preceding stroke. Thus, during the reversal of the stroke, the guide lever 21 prevents the blade from cutting into the sharpening body, the trailing edge of the blade being lifted, from the surface 32 shortly before the end of the stroke.

The carriage is moved to the right and before the end of the return stroke, the blade is again lifted from the surface 32 by engagement of surface 24 with abutment 28. At this end of the stroke the blade is turned completely, for sharpening of the other side during the following stroke. The reversal of the blade takes place as follows:

After the lever 21 has come in contact with abutment 28, the carriage is moved still further to the right until the point 26 slides off the abutment. The disks 18 then roll on flanges 30 until one of the flats 19, 20 lies against the flange thereby turning the blade to the vertical position shown in Fig. 1. Only after the blade is in this position the carriage has reached its stop at this end of the stroke. As may be readily understood, the blade operating levers 21 guide the blade in such a way that it will not slide off the outer edge of the sharpening body which would injure the delicate cutting edge of the blade.

The device being worked by hand, it might happen that the carriage is not moved fully against its stop and, for instance, only to the position in which the point 26 of lever 21 is directed towards the abutment 28, as shown in Fig. 7*a*. If the movement of the carriage is reversed at this moment, lever 21 will, due to its point 26, readily slide off the abutment 28 and either be turned up or down. In the first case, the leading edge of the blade will be lifted above the surface 32 and no damage to blade or sharpening body can result. In the second case, the blade is brought to its vertical position and reversed to the same way as in normal operation, again without the blade touching any part which could damage its cutting edge.

During the sharpening operation, the slides 6 of the carriage abut at the end of the stroke against stops 35 formed upon a wire pivoted at 36 and held in its normal position by a wire spring 38. By pressing upon knob 37 the stops 35 are swung to their upper position, in which position they are opposite slots 34 provided in slide 6. As may be easily understood, the carriage can then be moved still further to the right until the bottom of its slots 34 reach the stops 35. In this position of the carriage the disks 18 and levers 21 have moved beyond the ends of flanges 30, so that the blade-holder can be taken out of its supports for insertion or removal of the blade.

Figs. 9 to 15 illustrate another form of my invention, intended for use with razor blades having only one cutting edge. In this form disk and blade operating lever may be made in one piece 39 mounted upon the ends of the blade-holder. Each of the pieces 39 has two circular portions 40 with adjacent guide surface 41, 41′ cooperating with the abutments 27, 28 of frames 1. Lever 39 is pointed at one end (as at 26, Fig. 7) this pointed end being on the same side to the blade-holder axis as the cutting edge of the blade. On the opposite side lever 39 has a flat 43 which lies against the flange 30 when the blade is in its vertical position.

The operation of this device is similar to that of Figs. 1 to 8. In Fig. 14[I] the blade is in its vertical position, perpendicular to the path of the carriage. When the latter is moved in the direction of the arrow (Fig.

14) lever 39 engages abutment 28 and is turned to the horizontal position shown in Fig. 14II. The blade is thereby lifted above the sharpening surface 32 and then, as the carriage is moved further to the left, gradually placed upon the surface and drawn across it, (Fig. 14III). Towards the end of the stroke, lever 39 engages abutment 27, the blade is lifted from the surface 32 and, as the carriage continues its movement, the point 26 slides off the abutment 27 and the blade swings to the vertical position shown in Fig. 14IV. The movement of the carriage is then reversed and the process described above repeated.

In this form also the point 26 in cooperation with abutments 27, 28 prevents any damage to blade and sharpening body, when, through carelessness of the operator the carriage is reversed before having reached the end of the stroke.

Should the carriage be reversed when the blade-holder is in the position III of Fig. 14, the blade will immediately be lifted from the surface 32 as the round portion 40 will roll on flange 30. The lever 39 will swing up and lie against flange 30. The blade is thereby kept in almost horizontal position and cannot stick out above flange 30, so that there is no danger of the user cutting himself.

It will be understood that I am free to make any changes of detail within the scope of the invention as defined by the appended claims and I do not limit myself to the specific construction as herein described.

What I claim is:—

1. A device for sharpening double edged safety razor blades, comprising a frame having races, a carriage slidably mounted in said frame, a sharpening body mounted in said frame and arranged obliquely in the path of the carriage, levers pivotally mounted on said carriage, a blade holder rotatably mounted in said lever and having disks engageable with the races, springs active on said levers to cause said disks to be pressed against said races, said discs having flat portions substantially at right angles to the plane of a blade in the holder and a double armed lever mounted on the blade holder and having guide surfaces, said frame having abutments arranged to cooperate with the guide surfaces of said lever to lift the blade on and off the sharpening body, each arm of said lever having oppositely inclined edges converging toward its outer end and also having opposed concave surfaces in its upper and lower sides, arranged for engagement by the abutments at the ends of the strokes of the carriage to lift or lower the edge of the blade with respect to the sharpening body according to the direction of movement of the carriage, to facilitate operation of the apparatus and prevent binding.

2. A device for sharpening single edged safety razor blades, comprising a frame having races, a sharpening body mounted on the frame, a carriage slidably mounted in the frame, a blade holder rotatably mounted in the carriage, levers fixed on the ends of the blade holder axis and having guide surfaces comprising a flat portion adapted to engage the races to hold the blade in a vertical position, two concentric portions arranged to slide on the races to press the blade on the sharpening body and to roll on the races to turn the blade at the end of each stroke, said frame having abutments, and said levers also having a pointed extension opposite said frame portion and arranged to cooperate with said frame abutments to lift the blade on and off the sharpening body.

In witness whereof I affix my signature.

WILHELM BARSCH.