Dec. 15, 1931. O. W. BOCHE 1,836,064

SAFETY RAZOR SHARPENER.

Filed Aug. 17, 1928

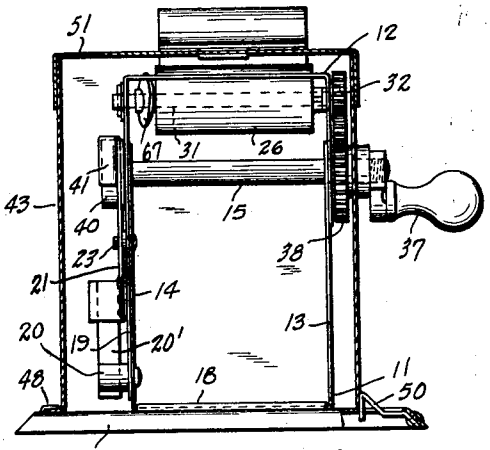


Fig. 1.

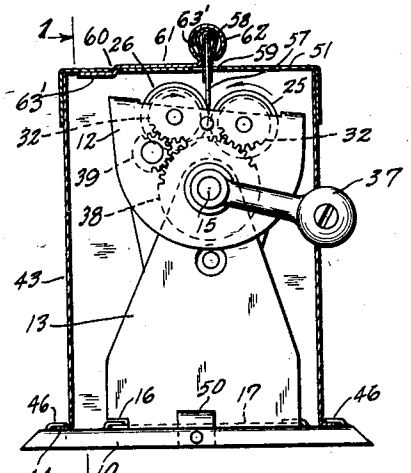


Fig. 2.

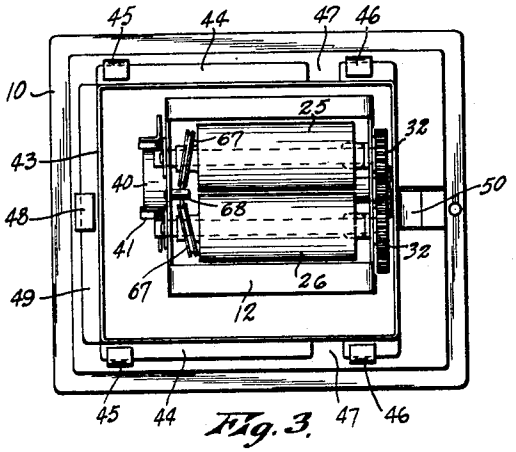


Fig. 3.

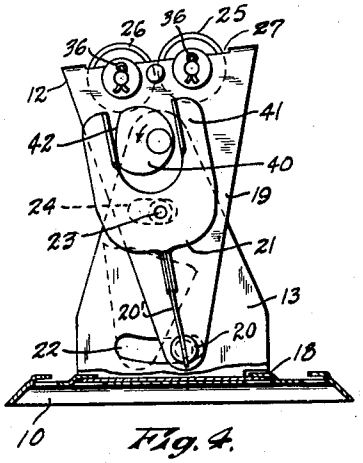


Fig. 4.

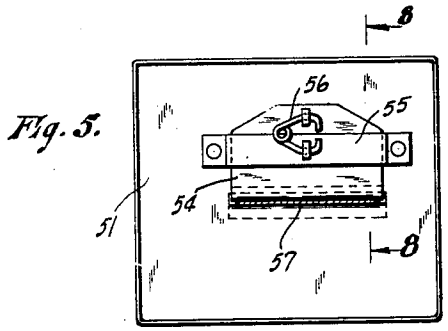


Fig. 5.

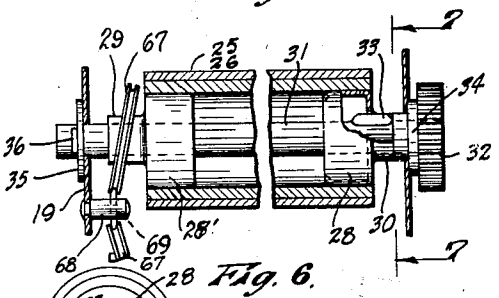


Fig. 6.

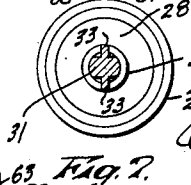


Fig. 7.

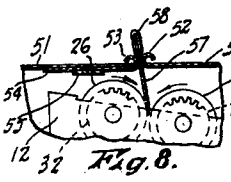


Fig. 8.

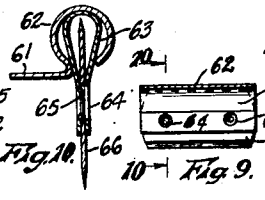


Fig. 9.

Fig. 10.

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UNITED STATES PATENT OFFICE

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SAFETY RAZOR SHARPENER

Application filed August 17, 1928. Serial No. 300,328.

This invention relates to a sharpener for safety razor blades, and has for an object to provide a simple and improved device which may be operated by any one unskilled in the sharpening of razors to properly sharpen the blades evenly on both sides by the simple operation of manipulating a hand crank.

It is also an object to provide a device of this character of a structure which will require only a small space and may be easily carried, and which may be manufactured and assembled at low cost.

It is a further object of the invention to provide a device of this character in which the sharpening elements may be easily and quickly renewed without the use of special tools.

With the foregoing and other objects in view, the invention consists in certain novel features of construction, combinations and arrangements of parts as will be more fully described in connection with the accompanying drawings. In these drawings,

Fig. 1 is a longitudinal vertical section through the device substantially on line 1—1 of Fig. 2.

Fig. 2 is a vertical transverse section through the forward end of the casing showing the interior mechanism in elevation.

Fig. 3 is a top plan view with the casing removed.

Fig. 4 is an end elevation thereof looking from the left of Fig. 3 but showing the base in section.

Fig. 5 is a bottom plan view of the top of the casing showing the means for holding the blade.

Fig. 6 is a detail partial section and partial elevation showing the mounting and construction of the sharpening rollers.

Fig. 7 is a transverse section substantially on line 7 of Fig. 6.

Fig. 8 is a detailed section substantially on line 8—8 of Fig. 5.

Fig. 9 is a longitudinal section through the blade holder showing how a blade of the Gillette type is held, and

Fig. 10 is a transverse section on an enlarged scale taken substantially on line 10—10 of Fig. 9.

The structure illustrated comprises a sheet metal base 10 on which the mechanism is mounted. This mechanism includes a lower frame 11, and an upper rocking frame 12 which is pivoted to the upright side members 13 and 14 of the lower frame, this pivot being the main drive shaft 15 which is journalled in the sides 13 and 14 of the lower frame. The lower frame 11 may be made of sheet metal bent to substantially U-shape, and may be notched at its opposite ends, as shown at 16, so that its base portion 17 may be slid longitudinally under ears or strips 18 which are cut from the base 10 and forced upwardly. These ears 18 have a certain spring action which firmly grips the edges of the base portion 17 and holds the frame in position.

The upper or rocking frame 12 is of substantially inverted U-shape so that its end members are pivoted on the shaft 15. One of its end members 19 is extended downwardly to a point adjacent the lower end of the frame 11 where it is pivotally connected, as shown at 20, to a flat spring 20′ secured to the rocking or cam lever 21, and the side of the lower frame may have an elongated curved slot 22 to give clearance to the inner end of the pin 20. The lever 21 is pivoted to the frame member 14 by a pivot 23, and the downwardly extending member 19 of the upper frame has an elongated slot 24 through which this pivot extends so that the pivot will not interfere with the rocking movements of this frame 12.

Mounted in the upper or rocking frame 12 is a pair of sharpening rollers 25 and 26. These rollers are arranged in parallel relation and extend through an opening 27 in the top horizontal member of the frame. These rollers may be of any suitable material but are preferably paper tubes on the outside of which the sharpening mixture is applied, or they may be made of some other material covered with leather, canvas, paper or other suitable material on which this material is applied. The tube is mounted on metal caps 28 and 28′ inserted in the ends of the tubes and having reduced necks 29 and 30 to receive the shaft 31. Secured to one end of this shaft is a gear 32 which operates the shaft. The cylinder is secured to the shaft

so as to turn therewith by means of lugs 33 struck up from the shaft and adapted to seat in notches or slots in the neck 30 of the cap 28. In assembling, the roller with the two caps in position is placed between the sides of the frame 12 and the shaft 31 is passed through openings in these sides and through the two caps with the lugs 33 seated in the notches in the reduced end 30. A stepped collar 34 is placed on this shaft before it is inserted and forms a bearing for the shaft in the side wall of the frame 12. A washer 35 is placed on the opposite end of the shaft outside the side member of the frame and the whole assembly is secured in position by a cotter pin 36. It will be apparent that the user, even though unskilled in mechanics, may easily remove these rollers should they become worn or injured and insert a new roller, all that is necessary being to remove the cotter pin and withdraw the shaft which will permit removal of the roller.

The main drive shaft 15 is operated by means of a hand crank 37 and carries a gear 38 which meshes with one of the gears 32 on the rollers and drives the other roller through an idler 39. The gears are so arranged that the turning of the crank 37 to the right or clockwise, as viewed in Fig. 2, will rotate the right hand roller 25 to the left or counter-clockwise and the left hand roller to the right or clockwise. In other words the upper sides of these two rollers move toward each other.

It is also desirable to give the rollers a longitudinal movement as well as a rotary movement to more nearly simulate the action used in hand stropping the old style of razor. For this purpose the collars 28′ at one end of the rollers are each provided with a grooved pulley or wheel 67 set at an angle to the axis of the roller shafts, as shown in Figs. 3 and 6. A stud 68 is mounted on the frame 19 and carries a cross pin 69 which projects at its opposite ends in the grooves in the pulleys 67. Thus due to the inclined arrangement of these pulleys the pin 69 causes the rollers to slide longitudinally back and forth on the shafts 31 as these rollers rotate, the slots in the collars 28 for the lugs 33 and these lugs being made long enough to permit this movement.

On its inner end the shaft 15 carries a cam 40 which is engaged on its opposite sides by the sides of a fork 41 carried on the rocking lever 21. This cam is preferably provided with a somewhat flattened surface 42 on one side so that as it rotates it will alternately disengage from the sides of the fork and cause a dwell or rest in the movements of the rocking lever at the two extremes of its rocking movement.

The entire mechanism is enclosed within a sheet metal casing 43 which is preferably open at the top and bottom. At its lower end it is provided with outwardly extending flanges 44 which may slide under upwardly extending ears 45 and 46 cut from the base 10. Each of the flanges 44 has a notch 47 suitably spaced from one end so that the casing 43 may be placed over the interior mechanism with the ear 46 passing through the notches 47 in which position the other end of the flange 44 will be to the right of the ears 45, as viewed in Fig. 3, then by sliding the casing to the left the long portions of the flanges 44 pass under the ears 45 and the short portions under the ears 46 securing the casing in the proper position on the base. This movement is limited by a stop lug 48 engaging the flange 49 in the side of the casing, and a spring catch 50 engaging the opposite side of the casing prevents its sliding backwardly and releasing from the ears 45 and 46. The casing, however, may be easily removed by depressing the spring catch 50 and then sliding it from under the ears 45 and 46. The handle or crank 37 is threaded on the end of the shaft 15 and, of course, is not applied until the casing is in position.

The upper end of the casing is closed by a cap or cover 51 which fits the top of the casing and is held by frictional engagement therewith. This top may be formed, as shown in Figs. 1 and 2, or as shown in Figs. 5 and 8. As shown in Figs. 1 and 2, the top has a slot 59 and a slit 60 spaced to one side thereof. A holder 61 of sheet metal is rolled over at its free end to form a circular spring clamp 62 open at its under side. A spring clip 63 is folded upon itself to receive the blade 57 between its side portions and if the blade has a guard 58 this guard is enclosed in the curved or folded portion of the clip, the blade being slid in from one end. The clip and blade is now slid into the curved bead 62 of the holder from one end thereof and a tongue 63′ on this holder is inserted in the slit 60 and lies against the under side of the cover as shown in Fig. 2. The blade is now held in the upright position between the sharpening rollers 25 and 26, as shown in Fig. 2. If the Gillette type of blade with a double edge and no guard 58 is to be sharpened it is held, as shown in Figs. 9 and 10. The sides of the clip 63 are provided with openings 64 to align with the openings in the blade 66 and one set of these openings 64 are rolled or forced inwardly, as shown at 65, to extend into the openings in the blade and cooperate therewith to hold the blade in the clip. The clip and blade are now inserted in the holder which is mounted in the top of the casing the same as shown in Fig. 2.

As shown in Figs. 5 and 8 this top is formed with a slot and one side of this slot is rolled over to form a bead 52. A similar bead 53 is formed on a sliding clamp 54 which is

mounted on the under side of the cover and is adapted to move back and forth toward and from the bead 52, the bead 53 extending outwardly through the slot in the cover. The clamp 54 is held against the under side of the cover by a strap 55, and a spring 56 secured to this clamp 54 and the strap 55 tends to slide the member 54 to hold the bead 53 against the bead 52. This forms the holding means for the safety razor blade 57 to be sharpened, the protecting clip 58 acting as a limit stop to prevent insertion of the blade too far into the holder.

The operation is as follows: The handle 37 and the cam 40 are so placed on the shaft 15 that when the handle is down or in its lowest position the upper wall of the frame 12 is substantially horizontal so that the rollers 25 and 26 are on opposite sides of the slot for the razor blade in the cover. The razor blade may now be inserted, as shown in Fig. 2 or as shown in Fig. 8, with its cutting edge downward, and as the rollers are in the neutral position this insertion of the blade in position will not drive the sharp edge against the rollers to either cut the rollers or injure the blade. The spring 56 clamps the blade between the beads 52 and 53 and the tendency is to retain it in the upright or vertical position, while the holder 62 also holds it in the upright position. The crank 37 is now turned to the right or clockwise which will rotate the rollers 25 and 26 in opposite directions, and at the same time the pin 69 acting in the grooved wheels 67 will slide the rollers back and forth longitudinally of the razor blade, giving a combined rotary and longitudinal movement to the rollers. At the same time the cam 40 acting on the sides of the fork 41 on the cam lever 21 will rock this lever back and forth and through it and spring 20′ will rock the casing 12 about the pivot shaft 15. This movement will alternately bring and press the rollers 25 and 26 against the opposite sides of the sharp edge of the blade, the spring 20′ yielding sufficiently to hold the rollers with the proper pressure against the blade. At this time a dwell or rest is alternately permitted the frame 12 by the flat 42 on the cam so that each roller will remain for a short time against the edge of the blade as it rotates, and the rollers will alternately, uniformly and equally sharpen the opposite sides of the blade. The pressure of the rollers against the opposite sides of the blade is controlled by the spring 20′. This action, therefore, yieldingly presses the rollers against the blade with the desired pressure for the sharpening operation and the combined rotary and longitudinal movement of the rollers gives a stropping action closely simulating the hand stropping given to the old style of razor.

It will be apparent from the foregoing description that no skill is required in sharpening the blades, all that is necessary being to insert the blade in the clamp and then turn the crank for a few revolutions. This operation will automatically sharpen both sides of the blade, and the operation on the two sides will be uniform and equal. The device may be used on a table, or it may be secured to a wall or shelf or it may be held in the hand as desired.

Having thus set forth the nature of my invention, what I claim is:

1. In a sharpener for safety razor blades, a U-shaped support, an inverted U-shaped frame pivotally mounted on said support, a pair of sharpening rollers mounted on said frame, a lever connected to said frame, a shaft, means for operating the shaft, a connection from the shaft to the lever for rocking the lever, means for supporting a razor blade between the rollers, and driving connections from the shaft to the rollers.

2. In a sharpener for safety razor blades, a support, a frame pivotally mounted on said support, a pair of sharpening rollers mounted on said frame, means for supporting a blade to be sharpened between the rollers, a lever connected to said frame having a fork, a shaft, a cam on the shaft in said fork to rock said lever in opposite directions to bring the rollers alternately in engagement with the blade and having a flattened portion on one side to cause a dwell at the extremes of the rocking movements when the respective rollers are in contact with the blade, and a driving connection from the shaft to the rollers.

3. In a sharpener for safety razor blades, a support, a frame pivotally mounted on said support, a pair of sharpening rollers mounted on said frame, a lever connected to said frame through a spring adapted to yield in opposite directions, said spring forming a yieldable driving connection from the lever to the frame, a shaft, means for operating the shaft, a connection from the shaft to the lever for rocking the lever, means for supporting a razor blade between the rollers, and driving connections from the shaft to the rollers.

4. In a sharpener for safety razor blades, a support, a frame mounted for rocking movements on the support, a pair of sharpening rollers, a crank for operating the rollers and rocking the frame, a casing enclosing the rollers and frame having an elongated opening in its top wall, a blade support on the said top wall including a spring clamp to hold the blade upright between the rollers, and a spring in the frame rocking means forming a yieldable driving means for the frame to yieldingly press the rollers against a blade between the rollers.

5. In a sharpener for safety razor blades, means for supporting the blade, a pair of sharpening rollers, means for rotating the rollers in opposite directions including a

shaft in each roller, a lug projecting from said shaft, a collar about one end of said shaft supporting said roller, said collar having a slot therein to slidably receive said lug thereby forming a splined connection between said roller and said shaft, means for causing relative lateral movements between the blade and rollers to cause contact of the rollers alternately on opposite sides of the blade, and means for causing relative longitudinal movement between the rollers and the blade including a collar about the other end of each shaft, a grooved wheel mounted at the other end of each shaft at an oblique angle thereto and a fixed stud projecting into said groove.

In testimony whereof I affix my signature.

OTTO W. BOCHE.