March 26, 1935. A. J. DREMEL 1,995,536

RAZOR BLADE SHARPENER

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Fig. 2

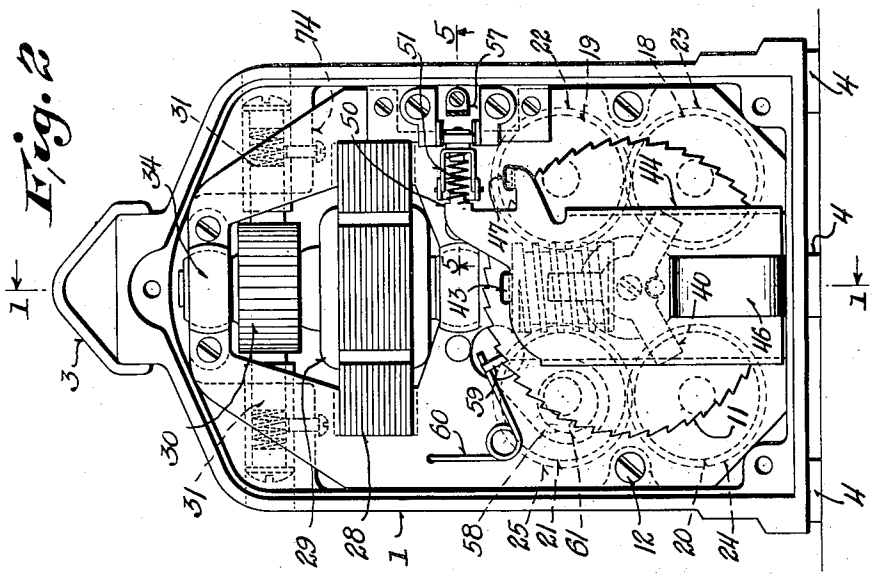
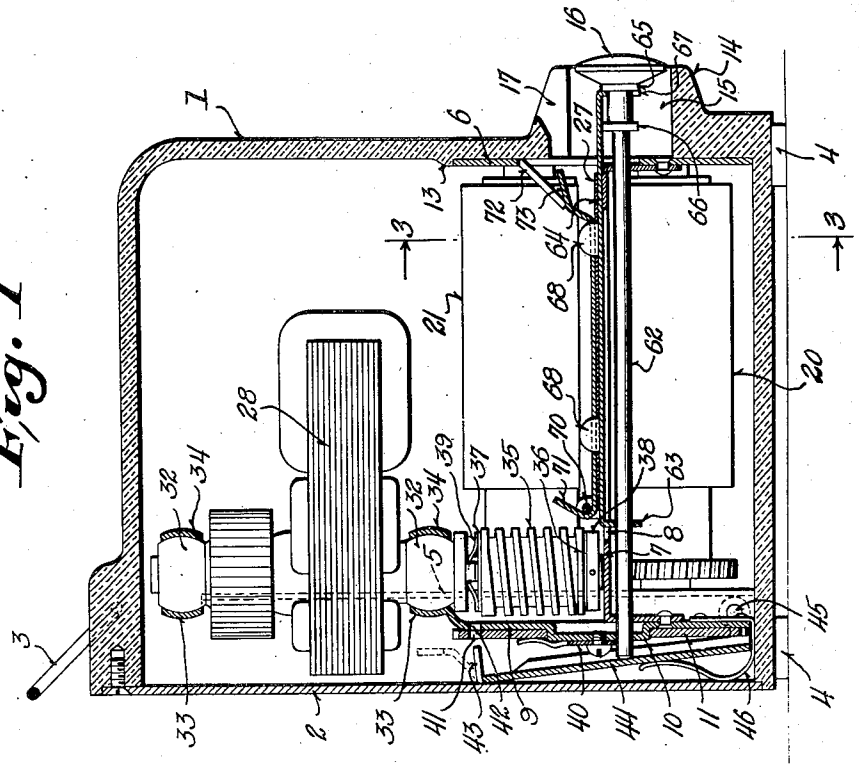


Fig. 1

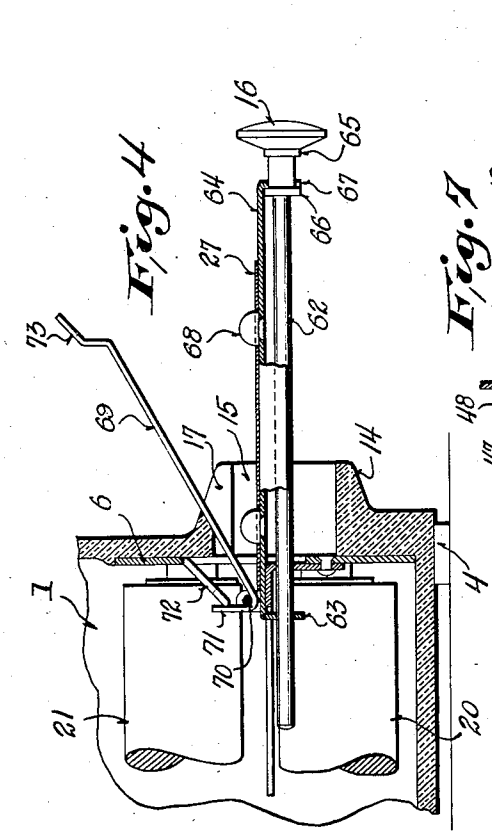


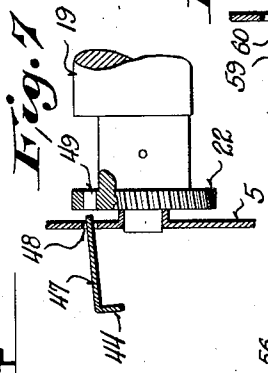
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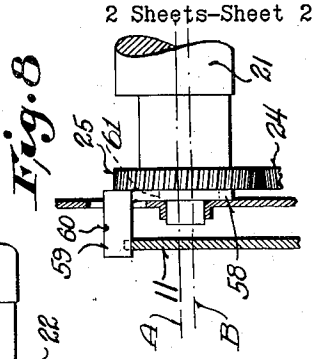
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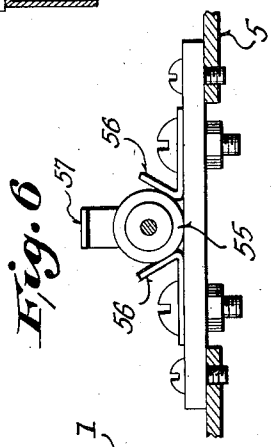
RAZOR BLADE SHARPENER

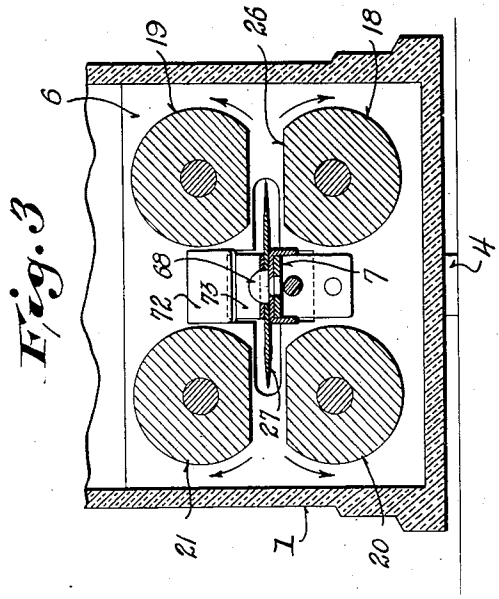
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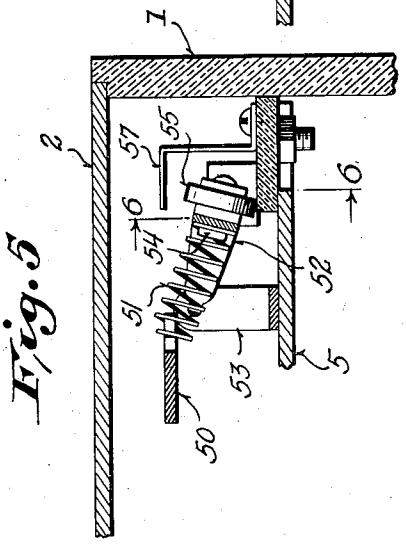












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RAZOR BLADE SHARPENER

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11 Claims. (Cl. 51—80)

This invention relates to razor blade sharpeners.

Objects of this invention are to provide a razor blade sharpener which is power driven, although certain features are applicable to hand driven sharpeners; which is provided with a novel form of reduction mechanism between an electric motor and the sharpening rollers; which is provided with a slip mechanism between the motor and the rollers; which is provided with a stop mechanism for stopping the device after it has operated a predetermined time or, in other words, after the rollers have revolved a predetermined number of times; which, when it is automatically stopped, also automatically opens the switch for the motor and locks the rollers in a predetermined position so that the blade can be removed or inserted without engaging the rollers; and which is so made that the manually operable switch means, or rod, is movable without moving the blade holder, thereby permitting the automatic opening of the switch without operating the blade holder, all as will appear from the detailed description of an embodiment of the invention, hereinafter appearing.

Further objects are to provide a novel form of power driven razor sharpener in which a timing ratchet gear has means, such for instance as a hole, into which a locking lever drops, such locking lever having means, such for instance as an arm on a lever, which locks the rollers positively in place in the proper position for removal or insertion of the razor blade, which automatically opens the switch, but which does not open the switch until the lever actually drops into the hole in the roller so that the machine cannot stop in any but the correct position.

Further objects are to provide a power driven razor sharpener which is very compact, which may be easily hung upon or placed upon a support, which does not expose the operator to any danger whatsoever, which is so made that the blade holder cannot conveniently be withdrawn until after the machine has ceased operating, and which also is so made that the machine cannot be started until the blade holder has been pushed completely into position.

Further objects are to provide a novel form of blade holder for a razor sharpener which is of relatively simple and rugged construction, which cooperates with a switch controlling manually operable member so that when the member is pushed in, the blade holder is carried with such member, preferably a slight lost motion being given the switch operating member, such holder being so constructed that it automatically opens for the reception or removal of a blade whenever the blade holder is pulled out to its final position.

Further objects are to provide a simple power driven razor sharpener which is cheap to manufacture, which is reliable in operation and which although automatic in its operation, is nevertheless of relatively simple construction.

In actual practice it has been found that razor blades sometimes break during the sharpening process and fall downwardly from the sharpening rollers. This invention, however, provides means whereby any falling portions of broken razor blades will not damage the motor. The motor in this invention is placed within and at right angles to the sharpening rollers, and thus at one and the same time guards the motor against damage from broken razor blades, and also provides a simple and easily followed means for providing for reduction of speed between the motor and the sharpening rollers by means of a worm gear reduction. In addition to this, the otherwise waste space immediately above the sharpening rollers is used by the body portion of the motor and consequently the utmost compactness results.

An embodiment of the invention is shown in the accompanying drawings, in which:—

Figure 1 is a longitudinal sectional view of the device, such view being drawn to an enlarged scale and being taken on the line 1—1 of Figure 2.

Figure 2 is a rear view of the device with the rear cover plate removed and with certain parts in section.

Figure 3 is a fragmentary sectional view on the line 3—3 of Figure 1.

Figure 4 is a fragmentary detail view showing the blade holder in its open position.

Figure 5 is an enlarged sectional detail on the line 5—5 of Figure 2.

Figure 6 is a detail sectional view on the line 6—6 of Figure 5.

Figure 7 is a detail view, partly in section and partly broken away, showing the roller locking means.

Figure 8 is a detail section showing a portion of the timing mechanism.

Referring to the drawings, it will be seen that the device is mounted within a casing 1, which is preferably formed of bakelite. This casing is provided with a rear plate 2 held in place by screws and with a loop 3 pivoted adjacent its upper rear portion by means of which the device may be hung from a hook against the wall, if so

desired. It is also preferable to provide the casing with a plurality of pads or feet 4 so that if it is desired, the casing may be placed upon a horizontal support.

In the several figures, the wiring has been omitted for the sake of clearness.

The mechanism is carried by means of a main rear plate 5 and a front plate 6 rigidly joined by means of a longitudinal guide and bracing member 7, see Figure 1, such bracing member or guide being slotted, as indicated at 8, to carry the blade holder in a manner hereinafter to appear. This rear plate is bulged outwardly to provide a channel like rearwardly extending portion 9 and is also provided with a rounded protuberance 10 which forms a bearing for the rachet timing wheel or disc 11, as shown in Figure 1, such disc or rachet wheel 11 being most clearly shown in Figure 2. The rear plate 5 is held in place by means of screws 12, see Figure 2, which engage lugs formed integrally with the casing 1. The front plate 6 fits beneath a small shoulder 13 formed in the casing 1 to thereby hold the front plate accurately in place.

The front wall of the casing is provided with an outwardly projecting boss or flange 14, which is apertured, as indicated at 15, to receive the switch operating handle or knob 16. This boss or flange is also provided with a slot 17 in its upper portion so that the upper clamping member of the blade holder may freely rock upwardly, as shown most clearly in Figure 4. This flange or boss 14 is preferably oval shape to freely accommodate the width of the blade. It is to be noted from Figure 1 that when the parts are in their operating position, that the knob or handle 16 of the switch operating member is substantially housed within the boss or collar 14 and cannot be readily moved by the operator until it is automatically projected outwardly in a manner hereinafter to appear.

Four sharpening rollers 18, 19, 20 and 21 are provided, and, as will be seen from the dotted line indication in Figure 2, the rollers 19 and 18 and the rollers 20 and 21 are provided with intermeshing gears indicated respectively by the reference characters 22, 23, 24 and 25. The rollers are in each case pivoted or revolubly carried by the front and rear plates 6 and 5 respectively. Each of these sharpening rollers is provided with a flattened face 26, see Figure 3, so that when the rollers are stopped in the predetermined position shown in Figure 3, the safety razor blade 27 may be readily withdrawn or positioned.

The rollers are driven by an electric motor of any suitable type, such as that shown in Figures 1 and 2. This motor may comprise a field structure 28, an armature 29, commutator 30 and brushes 31. The motor is carried by the back plate 5 and is provided with self aligning bearings 32 held to spherically depressed portions 33 of the back plate 5 by means of the similar spherically depressed straps 34. The motor shaft loosely carries a driving worm 35 which meshes with both the gears 22 and 25, as indicated in Figure 2. As shown in Figure 1, this worm is carried between a lower fiber plate 36 and an upper fiber plate 37. The lower fiber plate 36 rests against a collar 38 rigid with the motor shaft, and the upper fiber plate 37 is pressed downwardly by spring means, such as the spider spring 39, see Figure 1, so that the worm 35 is loosely, though frictionally, held by the motor shaft, thereby providing a slip motion so that although the motor may still be spinning when the positive locking of the rollers occurs, nevertheless no damage will be occasioned the mechanism, as this slip motion prevents undue strains being imposed.

The timing mechanism consists of the rachet wheel 11 previously described, which is preferably held in place by a spider spring 40, see Figure 1, such spider spring also imposing a frictional restraint upon this timing rachet wheel and preventing its over-running at any successive step that is given it by the rachet hereinafter described.

The rachet wheel 11 is provided with an aperture 41, see Figure 1, which in the stopped position aligns with an aperture 42 formed in the channel portion 9 of the back plate 5. A finger 43 carried by a pivotally mounted spring pressed plate 44 is adapted to enter these apertures when they align, the aligning position being shown in Figure 1, although the spring pressed pivoted lever 44 is shown in its manually displaced position, in Figure 1.

This figure shows the position of the parts at the instant that the apparatus is started by pushing the knob or switch control member 16 inwardly. The plate 44 is pivoted to the channel shaped portion 9 of the back plate 5, as indicated at 45 in Figure 1, and a leaf spring 46 may be riveted to the back plate and may press against the lever 44 urging it towards the stopped position for the apparatus.

Referring to Figures 1 and 2, it will be seen that the lever 44 is in reality formed of channel shaped sheet metal to secure added strength. It is provided with a projecting pin or finger 47, see Figures 2 and 7, which is adapted to pass through an opening 48 formed in the back plate 5 and to enter an opening 49 formed in the gear 22 of the roller 19, as shown in Figure 7, to thereby positively lock all of the rollers in position with their flat sides towards the blade, as shown in Figure 3, the simultaneous locking of all of the rollers resulting from the intermeshing of the driving gears for the several rollers.

The lever 44, which may be considered the control lever, is provided with a third projecting finger 50, see Figures 2 and 5, upon which one end of a small helical spring 51 is seated. The spring 51 bears at its other end against the transverse portion of the U-shaped switch member 52, such switch member being pivoted upon brackets 53, as shown in Figure 5. The spring is centered upon the switch member 52 by means of the projecting end 54 of a bearing for the contact roller 55 of the switch, such contact roller being of metal and being insulated from the bearing and from the switch member 52. The parts are so arranged, as will be seen from Figure 5, that when the finger 50 moves outwardly or rearwardly, it will throw the roller 55 forwardly with a snap action into contact with the stationary contact blades 56 of the switch, as shown in Figure 6. It is preferable to provide a restraining stop 57 to limit the rearward or opening motion of the roller 55. It is clear also that when the finger 50 moves forwardly, as viewed in Figure 2, that it will cause the contact roller 55 or contact member to snap rearwardly away from the blades 56, thereby opening the motor circuit. This switch, therefore, furnishes a snap action both in closing and in opening the motor circuit, and it is automatically opened whenever the cam finger 43 of the lever 44, see Figure 1, drops into the slot of the rachet wheel 11.

Very simple means are provided for stepping

the rachet wheel 11 one notch for each revolution of the rollers. This may comprise a small eccentric strap member 58, see Figure 2, provided with a pawl blade 59, see Figures 2 and 8, which is urged by means of a spring 60 into engagement with the rachet wheel. The eccentric strap member 58 is carried by an eccentric 61 rigid with the shaft of the roller 21, as shown in Figures 2 and 8. Thus each time the rollers execute one revolution, the rachet wheel is stepped along one notch. The eccentric strap member 58 and the pawl blade constitute, in effect, a pawl.

In Figure 8, the axis of the roller 21 is indicated by the reference character A, and the axis of the eccentric 61 is indicated by the reference character B.

It will be seen from the description thus far given that whenever the control lever 44 is displaced or moved rearwardly, that the mechanism is set in operation and that the tongue 43, see Figure 1, of such lever rides upon the flat face of the rachet wheel 11 until the opening 41 again registers with the opening 42. At this time the tongue 43 will drop into these openings and the tongue 47 will lock the rollers in position, and the tongue 50 will snap the switch open thereby automatically stopping the apparatus and locking the parts in their correct position, the slip motion afforded the worm 35 preventing undue stresses being imposed upon the mechanism.

A very simple means is provided for starting the mechanism and this means may comprise a rod 62 rigid with and constituting a portion of the switch operating member, including the knob 16 hereinbefore described. This rod 62 is slidably carried by the brace 7 and by a rear ear 63 of the bottom section 64 of the blade holder. The forward end of the rod is provided with a pair of spaced flanges 65 and 66 between which downwardly extending lugs or ears 67 of the forward end of the bottom section of the blade holder are positioned, so that when the rod is pulled forwardly or pushed rearwardly, see Figures 1 and 4, the blade holder is also moved forwardly or rearwardly therewith, although lost motion is provided between the rod and the blade holder.

The blade holder is provided with upwardly projecting knobs 68 rigid with the bottom section 64 and adapted to enter the holes in the razor blade 27. The upper section of the blade holder 69 is hinged to the lower section, as indicated at 70 in Figure 4, and is provided with an upwardly extending tongue 71 adapted to strike the projection 72 integral with the forward plate 6 of the main frame, to thereby rock the blade holder into open position permitting the removal or insertion of the razor blade.

The forward end of the blade holder is provided with a slanting cam portion 73 which, when the blade holder is pushed all the way in as shown in Figure 1, rides beneath the projection or tongue 72 and thereby locks the blade holder in closed position tightly gripping the razor blade. The razor blade is then correctly positioned with respect to the sharpening rollers, the rollers, of course, being of any suitable type and being broadly referred to merely as sharpening rollers.

In operating the apparatus it is clear that the blade may be positioned in the blade holder and that the switch operating knob 16 may be pushed inwardly, thereby pushing the blade holder with its blade into the casing. Towards the rear end of the stroke of the switch operating member the rod 62 rocks the control lever 44 into the position shown in Figure 1, and the apparatus starts operating.

It is to be noted that while the apparatus is operating, the knob 16 is substantially housed by the boss or collar 14 so that it cannot be readily grasped by the operator. However, when the predetermined number of revolutions of the roller has been made, the control lever 44 snaps forwardly, thereby projecting the rod 62 and consequently the knob or manual member 16 forwardly into a position where it may be grasped by the hand of the operator, the lost motion between the blade carrier and the rod 62 permitting such operation. The apparatus is then stopped, the sharpening having been completed. The operator, therefore, is enabled to withdraw the blade holder only after the requisite number of revolutions of the rollers have been made, and only after the apparatus is stopped, thereby avoiding any possible injury to the operator.

It is also to be noted that the construction is such that the casing may be made of bakelite or other insulating material, thereby materially guarding against danger of short circuit or electrical shocks for the operator. The brushes and brush holders, as indicated in dotted lines in Figure 2, may be carried directly within bosses 74 formed integrally with the casing.

It will be seen that although the apparatus is automatic and automatically times the sharpening, or in other words stops the apparatus after the requisite time or number of revolutions of the sharpening rollers, that nevertheless it is relatively simple, is very compact and is subtantially fool proof.

Another important feature of this invention is that the construction is such that it readily lends itself to manufacture. The parts are comparatively simple, may be easily assembled and may be produced by quantity production methods at a comparatively small cost.

It is to be distinctly understood that the rollers may be of any type, either grinding or stropping rollers, and that the expression "sharpening rollers" is intended to cover any desired type of rollers.

Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:—

1. In a sharpening device of the character described, the combination of movable sharpening elements, a motor for driving said elements, reduction mechanism between said motor and said elements, and timing mechanism for independently and simultaneously stopping both said motor and said elements after said elements have operated a predetermined period, said timing mechanism positively locking said sharpening elements in a predetermined position.

2. In a sharpening device of the character described, a pair of sharpening rollers, an electric motor for driving said rollers, an electric circuit for said motor, a timing mechanism for automatically opening the circuit of said electric motor and for locking said rollers in a predetermined position against rotation after said rollers have operated for a predetermined period.

3. A sharpening device of the character described, comprising two spaced pairs of cooperating rollers, means for holding a razor blade in position to be sharpened by each pair of rollers, power means operatively coupled to said rollers

for simultaneously driving both pairs of said rollers, and automatic timing means for locking said rollers in a predetermined position against rotation after said rollers have executed a predetermined number of revolutions.

4. A razor blade sharpening device comprising sharpening rollers, power means for driving said rollers, means for stopping said rollers in a predetermined position against rotation, and slip mechanism between said power means and said rollers, said stopping means operatively interlocking with said rollers.

5. A razor blade sharpening device comprising sharpening rollers, means for holding a razor blade adjacent said rollers, intermeshing gears carried by said rollers, a worm engaging one of said gears, an electric motor for driving said worm, means for stopping said rollers in a predetermined position against rotation, and slip mechanism between said electric motor and said worm, said means for stopping said rollers preventing the overrunning of said rollers due to the momentum of said rollers, said stopping means operatively interlocking with said rollers.

6. A razor blade sharpening device comprising sharpening rollers, an electric motor for driving said sharpening rollers, a reciprocatory blade holder adapted to be slid into position adjacent said rollers and withdrawn outwardly from said rollers, a switch controlling said motor, and means for simultaneously moving said razor blade holder into operative position and closing said switch, whereby one operation positions the razor blade and closes the switch.

7. A razor blade sharpening device comprising sharpening rollers, an electric motor for driving said sharpening rollers, a recipricatory blade holder adapted to be slid into position adjacent said rollers and withdrawn outwardly from said rollers, a switch controlling said motor, and means for simultaneously moving said razor blade holder into operative position and closing said switch, said means having lost motion with respect to said blade holder.

8. A razor blade sharpening device comprising a casing having an opening in one wall thereof, a razor blade holder slidably mounted and adapted to pass through said opening, manually operable means for moving said blade holder into and out of said casing and having lost motion with respect to said blade holder, sharpening elements within said casing for operating upon the razor blade, an electric motor for driving said sharpening elements, and a switch controlling said electric motor, said switch being controlled by said manually operable means.

9. A razor blade sharpening device comprising a casing having an opening in one wall thereof, a razor blade holder slidably mounted and adapted to pass through said opening, manually operable means for moving said blade holder into and out of said casing and having lost motion with respect to said blade holder, sharpening elements within said casing for operating upon the razor blade, an electric motor for driving said sharpening elements, a switch controlling said electric motor, said switch being controlled by said manually operable means, and automatic means for opening said switch and projecting said manually operable means outwardly with respect to said casing.

10. A razor blade sharpening device comprising two pairs of cooperating sharpening rollers, a razor blade holder slidably mounted and adapted to move into or out of proximity to said rollers, manually operable means for moving said razor blade holder and having lost motion with respect to said razor blade holder, a timing ratchet wheel operated from said rollers and having a hole therein, a control lever provided with a tongue adapted to enter said hole after said rachet wheel has been rotated a predetermined distance, said manually operable means being adapted to rock said control lever in one direction and said control lever being adapted to project said manually operable means outwardly when said tongue has entered said hole, an electric motor operatively coupled to said sharpening rollers, and an electric switch controlled by said control lever and in turn controlling said motor.

11. A razor blade sharpening device comprising sharpening rollers, a slidable blade holder movable into and out of proximity to said rollers, manually operable means for moving said blade holder and having lost motion with respect to said blade holder, an electric motor for driving said rollers, an automatically actuated timing and stop mechanism for stopping said rollers, opening said switch and projecting said manually operable means outwardly with respect to said blade holder after said rollers have executed a predetermined number of revolutions.

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