Jan. 18, 1927. 1,614,492

M. H. RHODES

RAZOR STROPPING DEVICE

Filed Dec. 9, 1925

Fig. 1.

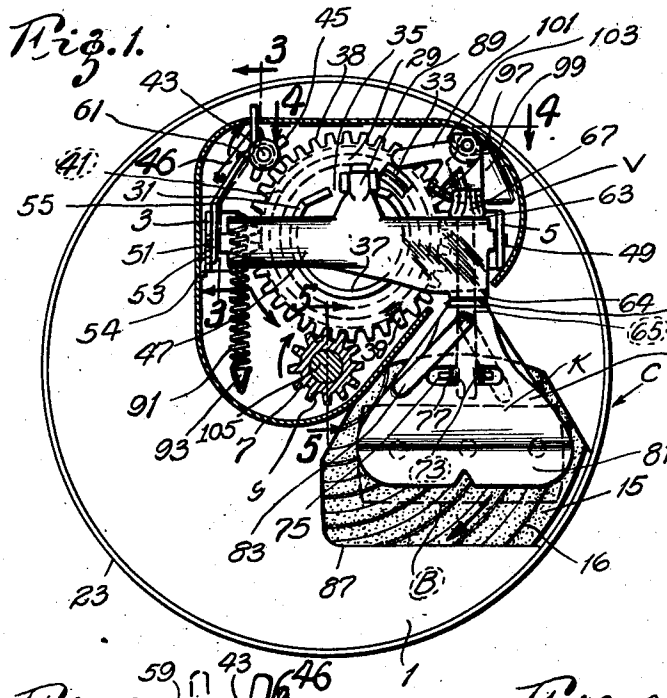


Fig. 2.

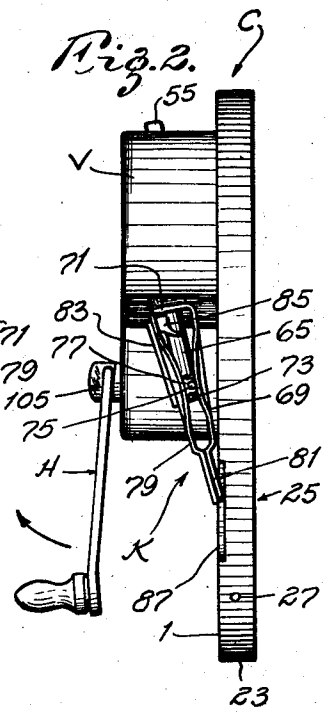


Fig. 3.

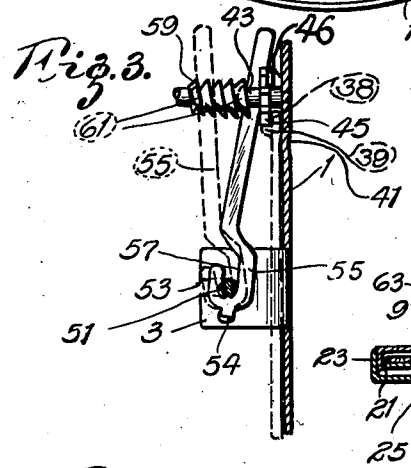


Fig. 4.

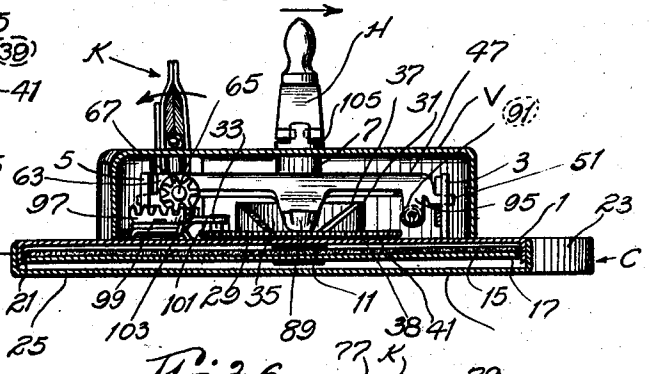


Fig. 5.

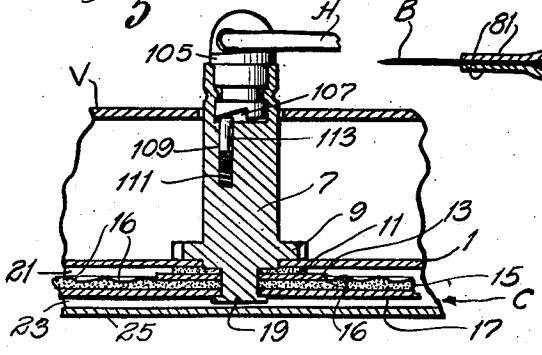
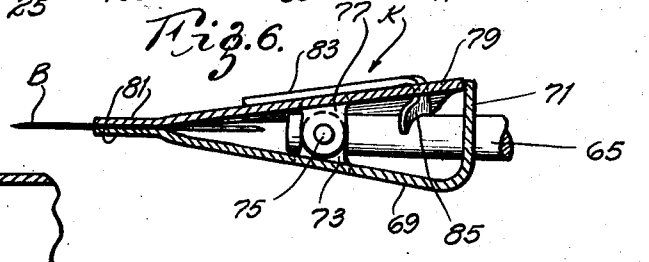


Fig. 6.



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UNITED STATES PATENT OFFICE.

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RAZOR-STROPPING DEVICE.

Application filed December 9, 1925. Serial No. 74,319.

This invention relates to stropping devices and with regard to certain more specific features to an automatic stropper for razors and the like.

Among the several objects of the invention may be noted the provision of a razor stropper which will dress both sides of a razor edge with a given pressure and after a period will automatically lessen the said pressure and continue to dress both sides of said edge; the provision of a stropper of the type described which will continue to step down the stropping pressures for a predetermined number of decrements or steps; the provision of a stropper of the class described which is adapted to start the said series of predetermined pressure decrements at any one decrement in the series; one which is adapted to repeat any decrement or series of them at the will of the operator; and the provision of a device of the class described which is simple and rugged in construction, light in weight and economical of manufacture. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists of the elements and combinations of elements, features of construction and arrangements of parts which will be exemplified in the structure hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is shown one of various possible embodiments of the invention,

Fig. 1 is a plan view of the device showing parts broken away, and shows a razor blade applied thereto in dotted lines;

Fig. 2 is a side elevation of the stropper with no blade therein;

Fig. 3 is an enlarged vertical section taken on line 3—3 of Fig. 1 and shows a feed screw in full;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 1 and shows the device in a transitional position;

Fig. 5 is a fragmentary enlarged detail section of a driving post; and

Fig. 6 is an enlarged side elevation of a blade clamp.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now more particularly to Figs. 1 and 2 of the accompanying drawings, there is illustrated at numeral 1 a preferably stamped base plate provided with struck up ears 3 and 5. Passing through a hole in the center of the plate 1 and rotatably borne in said hole is a driving post 7 (Figs. 1 and 5). The post 7 is integrally formed with a pinion 9 which rests horizontally on the base plate 1 and rotates thereon.

The post 7 passes down through said hole in plate 1, and is shouldered therebeneath to receive a resilient gasket 11, a spacing gasket 13, a preferably leather stropper disc 15 and a metal backing plate 17 for said stropper disc. After being supplied from below with the above assemblage of parts 11, 13, 15 and 17, in the order mentioned, the lower end 19 of the post 7 is flanged over the backing plate 17 to hold said assemblage to the rotative post. Hence the post 7 and stropper disc 15 are adapted to rotate as a unit with respect to the plate 1. The stropper 15 is provided on its upper surface with a spirally arranged ridge 16 serving purposes to be made clear. The ridge is pressed into the leather. The plate 1 is circular and at a radius adapted to clear the stropper disc 15 is flanged downwardly as indicated at numeral 21. The flange 21 snugly engages a vertical flange 23 formed on a protecting bottom 25. The flanges 23 and 21 are guided to fit together by means of a clip and eye combination 27 (see Fig. 2). Hence the stropper is adapted to rotate in a substantially enclosed compartment C. The vertical flange 25 is knurled or otherwise roughened in order that the device as a whole may be gripped for purposes to be described.

The pinion 9 engages and drives a gear 29 which is also rotatably held to the plate 1. The gear 29 has formed therewith a vertical barrel cam 31 and a struck up lug 33. The cam 31 comprises a downwardly notched portion 35 and a high portion 37. It should be noted that the lug 33 is near a transition point between the high and low portions 37 and 35 respectively, that is, as regards the circular measure around said cam 31. One of the teeth 38, namely tooth 39 of the gear 29 is displaced out of the plane of the other teeth on said gear. The gear ratio between the pinion 9 and gear 29

is preferably of about the order of one to three. The center of the gear 29 is located about midway between the ears 3 and 5 and the gear itself revolves on a slightly raised ridge 41 formed in the plate 1. The ridge provides ample bearing surface but does not produce excessive friction.

Rotatably borne between the plate 1, and a partial cover therefore (to be described) is a pin 43. This pin 43 is located only a short distance from the periphery of the gear 29 and carries fast thereto a driven pinion 45. The pinion 45, though a driven one, is not driven by the normally spaced teeth 38 of the gear 29. It is offset out of the plane of the normally spaced gear teeth and into the plane of the said offset tooth 39. The tooth 39 then engages a tooth of the pinion 45 once for every revolution of the gear 29. In the present embodiment of the invention the pinion 45 is provided with five teeth. Hence, for every three turns of the driving pinion 9, the gear 29 turns one revolution, and the driven pinion 45 turns one-fifth of one revolution. The quantitative figures quoted could be varied without invalidating the principles of construction herein described. In order that the pinion 45 may be resiliently held in a given turned position, a struck-up ear 46 of the base plate 1, is made to cooperate with the lower face thereof. The ear 46 has some spring to it and therefore permits the pinion 45 to be turned when force is applied to said pinion by way of the tooth 39.

It should be noted that the displaced tooth 39 will mesh with the teeth of the driving pinion 9 as well as will the other teeth on gear 29, because the pinion 9 is of a thickness adapted to permit such action.

The purpose in turning the pin 43 by means of the driven pinion 45, as described, will next be made clear.

Returning to the struck up ears 3 and 5, it will be seen that they have gudgeoned between them a cross member 47. The supporting gudgeon 49 at the ear 5 is supported in the conventional manner and is adapted to permit of some vertical pivotal play in the member 47.

The gudgeon 51 at the ear 3 is not conventionally supported. A vertical slot or notch 53 guides said gudgeon 51 vertically. Pivoted horizontally to one side of the notch 53, by means of an ear 54, is an adjusting lever 55. This lever 55 is provided with a slot 57 which, as the lever 55 swings on its pivot 54, is positioned across and swings along the notch 53. The slot 57 is adapted to have said gudgeon 51 pass therethrough, so that as the lever swings, the vertical position of the gudgeon 51 and hence the position of the cross member 47 is vertically altered.

The position of the lever 55 is altered by means of the movement of said pin 43. The pin 43 is provided with a downwardly buttressed thread 59 which cooperates with a tongue 61 formed on the lever 55. As the driven pinion 45 is intermittently turned clockwise (Fig. 1) the thread 59 so turns, and slowly and intermittently feeds the lever 55 from its lower to its upper position (Fig. 3). Enough initial spring tension is provided in the lever 55 to normally hold the tongue 61 in contact with thread 59. At any time desired by an operator, he may press the lever 55 aside against its tension and disengage the tongue and thread to reposition the lever on said thread. Since, however the thread in normal operation feeds the lever up, repositioning is usually downward. In order to facilitate such downward repositioning, the threads are buttressed downwardly so that if the lever is simply depressed the tongue 61 readily rides down over the thread (as in a ratchet and pawl combination) and is at any instant ready to be fed upwardly. It is evident that movement of the lever 55 upwardly, vertically moves the cross member 47. The movement is pivotal about gudgeon 49.

The member 47 has formed near the gudgeon 49, downwardly extending ears 63 and 64. These ears are laterally bored to rotatably receive a pin 65. The pin has formed at the rear end thereof a pinion 67 which incidentally functions as a shoulder adapted to ride against the rearward ear 63.

At its forward end (outside of the ear 64) the pin 65 is provided with a blade clamp K. The clamp is detailed in Figure 6, and comprises a stationary jaw 69 fixed to the pin 65 by means of a bored, turned-up ear 71 slipped over the pin 65, and bored turned up ears 73 pinned to the sides of the pin by a smaller pin or key 75. The key 75 also rotatably holds the downwardly turned ears 77 of a movable jaw 79. The jaws are provided with cooperating clamping lips 81 adapted to hold a razor blade B.

In order to tightly hold the blade B between the lips 81, a clamping lever 83 is pivoted to the surface of the clamp 79. The pivoted portion of the lever 83 passes through the clamp 79 to form a cam 85 which, when the lever 83 is in its Fig. 1 full-line position, does not cooperate with the pin 65 to an extent whereby the lips 81 are tightly held together. However, when the lever is put into its Fig. 1, dotted-line position, then the conditions illustrated in Fig. 6 are had, wherein the cam 85 rides up on the pin 65, whereby the rearward portion of the movable jaw 79 is strained upwardly and the forward portion is strained downwardly to tightly clamp the blade B, that is, if the blade is inserted as shown. At no times do the lips 81 quite leave each other, whereby a blade may readily be positioned

between said lips without danger of its falling. The jaws 79 and 69 are always strained against each other somewhat but only lightly when the arm or lever 83 is in its Fig. 1, solid-line position.

The purpose of the blade clamp K is to hold a blade against the strop disc 15 as said disc revolves. An opening 87 in the base plate 1 permits the said cooperation between blade and strop. In order to tilt the clamp K downwardly so that it may apply the blade to the strop 15, a nose or follower 89 is formed rearwardly from the cross member 47. The follower 89 is adapted to cooperate with the edge of the barrel cam 31. It is held thereto by the action of a spring 91 reacting between an upstruck finger 93 in the plate 1, and a downwardly extending arm 95 of said cross member 47. As the follower 89 rides on the relatively long high portion 37 of the cam 31, the clamp K is held down as shown in Figs. 1 and 2. When it rides in the low portion 35, the clamp rises high enough to be rotated with the pin 65. The purpose of this is to turn the blade over for sharpening on both sides of an edge. The cross member 47 is then also an oscillating member.

In order to turn the clamp through one hundred and eightly degrees while it is raised, that is, while the follower 89 is in the depression 35, a crown sector gear 97 is pivoted on a bridge 99. The gear 97 is provided with an extending arm or follower 101 which is adapted to cooperate with said lug 33 on gear 29. The lug 33 causes the crown gear 97 to move clockwise to the Fig. 1 position as the lug moves in a counterclockwise direction. It causes such action against the tension of a small coil spring 103 reacting from the bridge 99 to the arm 101 and adapted to return the arm to a counterclockwise position with its gear 97. It cannot do so however, until the lug 33 passes out of contact with arm 101. Now, the lug 33 contacts with arm 101 to turn the gear 97 as described, only when the follower 89 of the cross member 47 is in the depression 35 and hence when the pinion 67 is depressed, that is, when the clamp K is raised. The pinion 67 when so depressed meshes with the crown gear 97.

Events are so timed that the follower 89 reaches the bottom of its depression 35 just before the lug 33 engages the arm 101. Thereby the clamp K raises with its blade while the pinion 67 descends to mesh with the crown gear 97, that is, before the gear 97 starts moving. Then, as the lug 33 moves the arm 101, the gear 97 is caused to turn the pinion 67 through approximately one hundred and eighty degrees. This action of course turns over the clamp K and blade therein. As the turning action is completed the follower 89 rides up out of the depression 35 to depress the clamp K and raise the pinion 67 out of mesh. After this action the lug 33 clears the arm 101 and the crown gear 97 springs back to its starting position. The blade is then stropped on its other side until the turning or reversing action again takes place after one turn of the gear 29, or three turns of the pinion 9. The lug 33 is designed to decelerate the gear 97 to a stop as the arm 101 leaves said lug, and also to hold the gear 97 still until the follower 89 takes the gear 67 out of mesh.

For each revolution of the gear 29, the pinion 45 is also advanced by means of the tooth 39, whereby the pressure thread 59 is turned to feed up the lever 55 and cross piece 47. This action lightens the pressure between the blade and stropper. It is to be understood that the cam 31 and follower 89 are designed to give a relatively high pressure on the blade when the lever 55 is down and relatively lighter pressures as the said lever rises to raise the cross member 47 with its attendant parts. The teeth of the pinion 67 and gear 97 are adapted to mesh, regardless of the adjustment given to the member 47 by lever 55 and are therefore always operable as described.

The offset tooth 39 is so positioned that the transition from one pressure to another at the blade is brought about while the blade is in contact with the stropper. The change in pressure is adapted to take place at a period about mid-way between the time of application of the blade to the stropper and the time of lifting the blade from the stropper. By this means each side of the blade receives an equal amount of a given pressure of stropping.

In order to give the device a neat appearance, the above recited cam and gear mechanism is enclosed beneath a cover V. This cover V is held to the base plate 1 by riveted tongues. The cover is provided with proper openings for passage and movement of the blade clamp K and the pressure lever 55.

The driving post 7 is adapted to be turned by means of a foldable handle H pivoted thereto. In order that the motion of the stropper 15 may not be reversed against the cutting edge of the blade in clamp K, when the clamp is depressed, a non-reversing mechanism is formed in the post 7.

The non-reversing mechanism comprises a rotatable recessed plug 105 crimped into a recess of the post 7. The plug 105 is formed as a ratchet 107 on its lower face. Drilled into the bottom of said recess is a hole 109 adapted to receive slidable pin 113 and a coil spring 111 therebeneath. It is obvious that by means of the non-reversing mechanism that the stropper 15 may only be driven in a clockwise direction from the handle H. The handle H may be folded over and out of the way by moving it as indicated by the ar-

row in Fig. 2. This may be done at any position of the handle as far as rotation thereof is concerned.

The operation of the device is simple. All that need be done is to slip a blade to be sharpened into the clamp K, move the clamping lever 83 counter-clockwise from its Fig. 1 position, and turn the handle H in a clockwise direction. The described automatic operations then take place. If the handle H is inadvertently turned counter-clockwise, no harm is done to the device or blade, because of the operation of the non-reversing feature.

An operator may start the stropping operation with any pressure on the blade he desires (within limits of the design of apparatus). He may fully or partly depress the lever 55. Likewise he may start at a high pressure and after a time reset the lever 55 upwardly for a lighter pressure and thereby skip over some of the pressure range, thereby saving time. He also may repeat any given range of pressure if he desires, merely by depressing the lever 55.

The spiral ridge 16 on the stropper 15 functions as a surface, which not only moves circularly with respect to the blade, but sweeps outwardly along the length of the blade. By this means any tendency to cut grooves in the leather surface, due to grit and the like, is defeated. The grit is swept into the grooves between elements of the ridge.

The fact that the blade edge is not held along a radial line on the strop causes a criss-cross stropping effect to be had on the two sides of an edge being sharpened. This is an effect to be desired in sharpening fine edges.

In view of the above, it is believed that the various features of this invention will be clear without further elaboration, and it will be seen that with the apparatus herein described, the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A portable stropper comprising means for successively pressing alternate sides of a blade against a moving surface, means for automatically varying the pressure between the blade and surface to decrease at each alternate pressing event of a continued series of said events, and means for manually regulating the pressure at which the automatic variation of a continued series is to begin.

2. A portable stropper comprising means for successively pressing alternate sides of a blade against a surface moving other than at right angles to the edge of the blade, and means for automatically varying the pressure between the blade and surface to decrease at each alternate pressing event of a continued series of said events.

3. A razor stropper comprising a rotatable stropper disc, means for alternately pressing the two sides of a blade edge thereto comprising an oscillating member and a blade clamp rotatably held therewith, a second means adapted to oscillate the said member and turn the clamp, said means comprising a driving mechanism, and automatic means operable from said driving mechanism adapted to raise the oscillating member, whereby pressure is lessened between the blade and stropper disc, and means for manually changing said pressure.

4. A razor stropper comprising a rotatable stropper disc, means for alternately pressing the two sides of a blade edge thereto comprising an oscillating member and a blade clamp rotatably held therewith, a second means adapted to oscillate the said member and turn the clamp, said second means comprising a rotatable driving mechanism, and automatic means operable intermittently from said driving mechanism adapted to raise the oscillating member, said automatic means comprising an intermittently driven screw, a pivoted lever cooperating therewith to be moved and means for mounting the oscillating member so that it is moved by the lever.

5. An automatic pressure adjustment for a stropper of the class described comprising a pivoted lever upholding the pressure elements of the stropper, an intermittently operable screw for moving the lever, said screw being driven from the driving elements of the stropper.

6. An automatic pressure adjustment for a stropper of the class described comprising a pivoted lever upholding the pressure elements of the strop, an intermittently operable screw for moving the lever, said screw being driven from the driving elements of the stropper, means for resiliently pressing a portion formed with the lever to the thread, and a buttress cut on said thread whereby the lever may readily be manually pushed along the thread.

7. A razor stropper comprising a rotatable stropper disc, means for alternately pressing the two sides of a blade edge thereto comprising an oscillating member and a blade clamp rotatably held therewith, a second means adapted to oscillate the said member and turn the clamp, said second means comprising a driving mechanism, and automatic means operable from said driving mechanism adapted to raise the oscillating member, whereby pressure is lessened be-

tween the blade and stropper disc, and means for manually raising or lowering the oscillating mechanism independently of the said automatic means.

8. A razor stropper comprising a rotatable stropper disc, means for alternately pressing the two sides of a blade edge thereto comprising an oscillating member and a blade clamp rotatably held therewith, a second means adapted to oscillate the said member and turn the clamp, said second means comprising a rotatable driving mechanism, and automatic means operable intermittently from said driving mechanism adapted to raise the oscillating member, said automatic means comprising an intermittently driven screw, a pivoted lever cooperating therewith to be moved, means for mounting the oscillating member so that it is moved by the lever and means for temporarily disconnecting the lever from the screw for manual operation.

9. A portable stropper comprising means for successively pressing alternate sides of a blade against a moving surface and means for automatically varying the pressure between the blade and surface to decrease at each alternate pressing event of a continued series of such events.

In testimony whereof, I have signed my name to this specification this 7th day of December, 1925.

MARCUS H. RHODES.