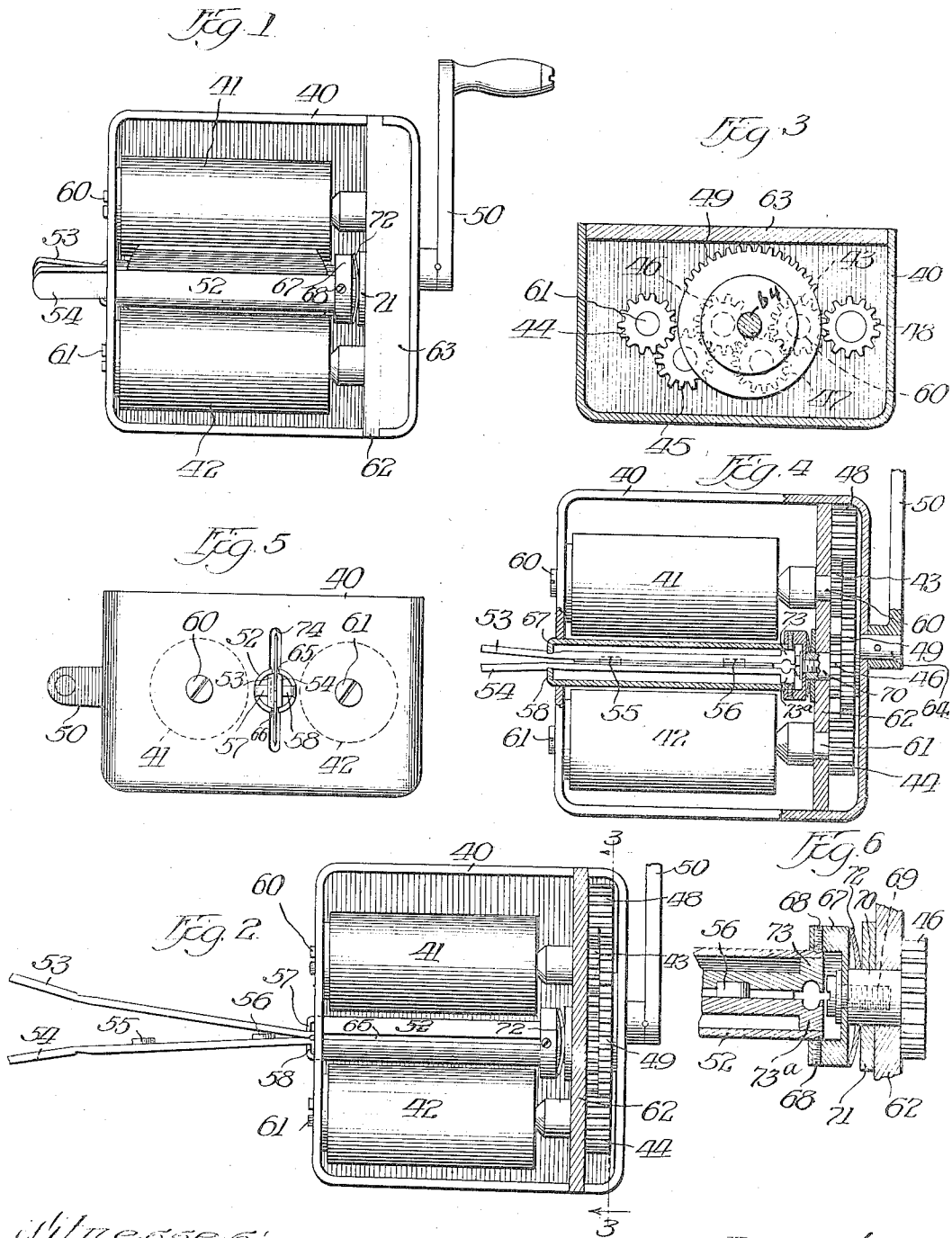


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 RAZOR BLADE SHARPENER.  
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1,206,315.

Patented Nov. 28, 1916.



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# UNITED STATES PATENT OFFICE.

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## RAZOR-BLADE SHARPENER.

1,206,315.

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*To all whom it may concern:*

Be it known that I, LEO EHRLICH, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Razor-Blade Sharpeners, of which the following is a specification.

The present invention pertains to features of novelty and improvement in razor-blade stropers or sharpeners, its leading object being the production of a construction which will sharpen both sides of the two edges of a double-edged blade while the operating-handle is turned in one direction only, although the invention is not limited to a structure solely adapted for double-edged blades.

A further object of the invention is the provision of a construction of this general character, wherein the stopping elements are cylindrical with uninterrupted operative-faces.

A still further salient characteristic of the invention is the employment of a razor-blade holder which effectively secures the blade in operative position and into which the blade may be introduced and from which it may be removed with ease and despatch.

In the preferred embodiment of this invention these cylindrical stopping or sharpening elements are geared together so as to revolve in the same direction, and the train of gearing connecting them has associated therewith a fragmentary or segmental gear equipped with an operative handle which actuates the gearing and stropers first in one direction and then in the opposite direction even though the actuating handle turns always in a single direction. This train of gearing is associated with the razor-blade holder by means of a friction or slip drive so as to rock the holder as occasion requires, to apply the blade edges to the opposite stropers. This rocking occurs upon each reversal of the direction of rotation of the stropers, which in turn is effected by the fragmentary or segmental gear engaging alternately two pinions of the gear train.

In the accompanying drawings a desirable embodiment of the invention is presented and throughout the various views like reference characters refer to the same parts.

In the drawings: Figure 1 is a plan view of the construction; Fig. 2 is a similar view

with the blade-holder extended for the reception of the blade and with the covering for the gears cut away to illustrate this portion of the mechanism; Fig. 3 is a section on line 3—3 of Fig. 2, with the parts viewed in the direction indicated by the arrows; Fig. 4 is a horizontal section through the structure and illustrates the details of construction of the blade-holder; Fig. 5 is an end view of the device as the parts are viewed from the lefthand of Figs. 1 and 2, and Fig. 6 is a detail section of the driving-means for rocking the blade-holder.

Referring to the drawings, it will be observed that the stropper or sharpener comprises a metal shell or case composed of a bottom-wall and a relatively deep upstanding rim. Two leather or other suitably covered cylindrical stropers or sharpeners are fixed to shafts 60 and 61, having bearings in one wall of the case and also in a division wall 62 having a top flange 63 covering the gearing hereinafter described. Shaft 60 has fastened to its end a pinion 43 which meshes with the teeth of another pinion 47 rotatably mounted on the wall 62, which in turn meshes with the teeth of another pinion 46 mounted on the end of a short shaft 70 extending through a bearing in the wall 62. Pinion 46 in turn meshes with another pinion 45 revolvably mounted on the plate 62 and the teeth of the latter are in mesh with those of a wider pinion 44 fixed to the end of shaft 61. These five gears or pinions constitute a train connecting together the shafts of the pair of spaced stropers or sharpeners. A gear or pinion 48 of the same width as the pinion 44, that is, wider or thicker than the other pinions, is also rotatably mounted on the wall 62 with its teeth in mesh with those of the pinion 43. A sector or fragmentary gear 49 is fixed on a shaft 64 extending through a bearing in the end-wall of the casing, its protruding end being equipped with a turning handle 50. The teeth of this segmental gear are adapted to mesh alternately with the teeth of the gears 44 and 48 to revolve the train of gears alternately in opposite directions. It was for the purpose of permitting this inter-meshing of the fragmentary gear with the pinions 44, 48, that the latter were made thicker or wider than the other gears of which the train is composed.

The blade-holder is composed of a slot-

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ted-tube 52 provided with the oppositely-disposed slots 65 and 66, the tube at one end having a bearing in one of the walls of the casing and having inturned lugs 57 and 58.

5 The opposite end of the tube has a cup 67 fitted thereover and fastened thereto by the screws 68, 68, such cup accommodating the head of a screw 69 which extends through an aperture in the bottom of the cup and fits

10 into a threaded hole in the shaft 70, having a bearing in the wall 62 and having fixed to its other end the pinion 46. A washer or collar 71 is fitted over and has a drive fit connection with the shaft 70 and between

15 that and the adjacent cup 67 a dished spring-washer 72 is provided which tends to separate the parts, or in other words, constitutes a slide or friction drive between the shaft and collar and the tubular holder, the cup 67 of which is rotatable on the screw 69, as illustrated more specifically in Fig. 6.

20 This slotted tubular-holder 52 accommodates two bars 53 and 54, the latter having pins 55 and 56 for the reception of a razor-blade, as, for example, those of the Gillette type, and the companion bar 53 has recesses for the accommodation of such pins. The inner ends of these cooperating bars 53 and 54 have outstanding ears 73 and 73<sup>a</sup> respectively, adapted by cooperation with the stops 57 and 58 when the bars are pulled out as illustrated in Fig. 2 for the reception of a blade, to limit such retraction of the inner holder.

30 The wall of the casing through which the cooperating bars 53 and 54 slide is provided with an elongated vertical opening 74 through which the blade is adapted to be inserted into and withdrawn from the holder.

40 The operation of this device is substantially as follows: In order to insert a blade, for example, a double-edged Gillette blade, the two bars 53 and 54 are pulled out to the position shown in Fig. 2, the amount of withdrawal being limited by the coaction of the parts 73, 73<sup>a</sup>, 57, and 58. The blade is inserted between the bars, the pins 55 and 56 fitting in the holes of the blade, as will be readily understood. Then the companion bars and blade are pushed back into the tubular holder, the blade passing through the aperture 74 of the wall. Of course, the blade can be inserted and withdrawn from the holder only when the slots of the tube are in register with the aperture 74. The blade having thus been inserted in the holder, the operator turns the handle 50 clockwise in the usual manner. When the teeth of the sector gear 49 are in mesh with the pinion 48 the two cylindrical stropping-elements 41 and 42 will both be rotated clockwise and, owing to the friction connection between shaft 70 and collar 71 and the blade-holder, the latter will be swung clockwise so as to

bring the upper-edge of the blade into contact with the stropper 41 and the lower-edge of the blade into cooperative relation with the stropper 42. The stropplers or sharpeners will continue their rotation, the holder, however, remaining stationary in the proper position for the engagement of the blade edges with the stropplers, as indicated, and held yieldingly in such relation by the slide friction drive referred to. This will continue as long as the sector 49 is in mesh with the gear 48. When, however, the sector engages the gear 44, the rotation of both stropplers will be reversed and the blade-holder will be swung so as to bring the opposite side of the upper edge of the blade into contact with the stropper 42 and the opposite side of the lower edge of the blade into contact with the stropper 41. As long as the sector is in engagement with the gear 44 the stropplers will revolve counter-clockwise and the blade will be held in yielding engagement therewith owing to the yielding friction drive specified. It should be clear, therefore, that by merely turning the handle 50 in one direction both sides of both edges will be stropped or sharpened, first the one side of either edge on one of the stropplers and then the other side of the same edge on the other stropper, as is necessary to secure the most effective sharpening action.

It should be understood that this reversal of the direction of rotation of the sharpeners, as well as the swinging of the blade-holder and the blade which it carries, is effected automatically even though the handle is revolved continuously in one direction. It is, of course, immaterial in which direction the handle is turned, as the action of the stropplers and holder will be the same in either instance. There is no danger of the blade becoming displaced in the holder, because it cannot be withdrawn except when the slots of the tube are in register with the hole 74, and this is only momentary in the swinging of the holder from one position to the other.

When the blade has been stropped or sharpened, the parts are moved so as to bring the slots of the holder into alignment with the aperture 74. Then the ends of the bars 53, 54, are grasped and the bars and blade are withdrawn, the blade passing outwardly through the opening 74, whereupon the bars may be separated as described in Fig. 2, for the removal of the blade.

While I have in this application set forth in detail a preferred and desirable embodiment of the invention, it is to be understood that the invention is susceptible of a variety of embodiments and it is not limited and restricted to the precise and exact details of construction herein illustrated and described.

In this application I have described and

illustrated a convenient construction for the sharpening of blades with two cutting-edges, but it will be apparent that the invention is susceptible of embodiment in a structure capable of handling single-edged blades.

I claim:

1. In a razor-blade stropper, the combination of a pair of revoluble stropers, a blade-holder, a rotatably-operating handle, a gear-connection between said handle and stropers including a mutilated gear to rotate said stropers alternately first both in one and the same direction and then both in the opposite direction, and a connection between said handle and the blade-holder adapted to rock the holder to apply the blade-edge alternately to the stropers, substantially as described.

2. In a razor-blade stropper, the combination of a pair of revoluble cylindrical stropers, a blade-holder, a rotatable operating-handle, a gear-connection between said handle and stropers including a mutilated gear to rotate said stropers alternately first both in one and the same direction and then both in the opposite direction, and a friction-drive connection between said handle and blade-holder adapted to rock the holder to apply the blade-edge alternately to the stropers, substantially as described.

3. In a razor-blade stropper, the combination of a pair of revoluble stropers, a blade-holder, a train of gears connecting said stropers together, a slip-drive connection between one of said gears and said holder, a rotatable handle, and a connection between said handle and train of gears, including a mutilated gear, substantially as described.

4. In a razor-blade stropper, the combination of a pair of revoluble stropers, a blade-holder, a train of intermeshing gears connected to said stropers and blade-holder, a rotatable handle, and a mutilated gear operatively associated with said gear-train and rotated by said handle, substantially as described.

5. In a razor-blade stropper, the combination of a pair of revoluble stropers, a blade-holder, a train of intermeshing gears connected to said stropers and blade-holder, two of such gears being thicker than the others, a mutilated operating-gear positioned to intermesh alternately with said thicker gears, and an actuating-handle for rotating said mutilated gear, substantially as described.

6. In a razor-blade stropper, the combination of a pair of revoluble cylindrical stropers, a blade-holder, a train of intermeshing gears connected to said stropers, a slip-drive connection between said gear train and said blade-holder, a mutilated operating-gear positioned to intermesh alternately with two of the gears of said train, and an actuating-handle for rotating said mutilated gear, substantially as described.

7. In a razor-blade stropper, the combination of a pair of revoluble stropers, a blade-holder, a first gear fastened to one of said stropers, a second gear in mesh with said first gear, a third gear connected to said blade-holder and in mesh with said second gear, a fourth gear in mesh with said third gear, a fifth gear connected to the other stropper and in mesh with the fourth gear, a sixth gear in mesh with said fifth gear, a rotatable operating-handle, and a mutilated gear revolved by said handle and positioned to alternately intermesh with said first and sixth gears, substantially as described.

8. In a razor-blade stropper, the combination of a pair of revoluble cylindrical stropers, a blade-holder, a first relatively thick gear fastened to one of said stropers, a second gear in mesh with said first gear, a third gear having a slip-drive connection with said blade-holder and in mesh with said second gear, a fourth gear in mesh with said third gear, a fifth gear connected to the companion stropper and in mesh with said fourth gear, and a sixth relatively thick gear in mesh with said fifth gear, a rotatable operating handle, and a mutilated gear revolved by said handle and positioned to alternately intermesh with said first and sixth thicker gears, substantially as described.

9. In a razor-blade sharpener, the combination of a revoluble cylindrical stropper, a train of gears connected to said stropper, an operating-handle adapted to be rotated always in one direction, a segmental-gear connection between said handle and gear-train also adapted to be rotated by said handle in one direction and oscillate said stropper, a blade-holder, and a slip-drive connection between said holder and gear-train, substantially as described.

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