F. K. FASSETT.

DEVICE FOR SHARPENING RAZORS.

APPLICATION FILED JUNE 9, 1911.

1,044,036.

Patented Nov. 12, 1912.

2 SHEETS—SHEET 1.

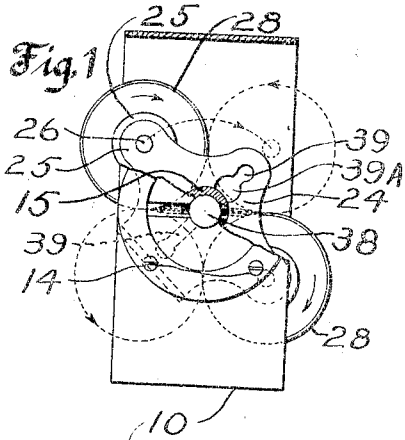

Fig. 1

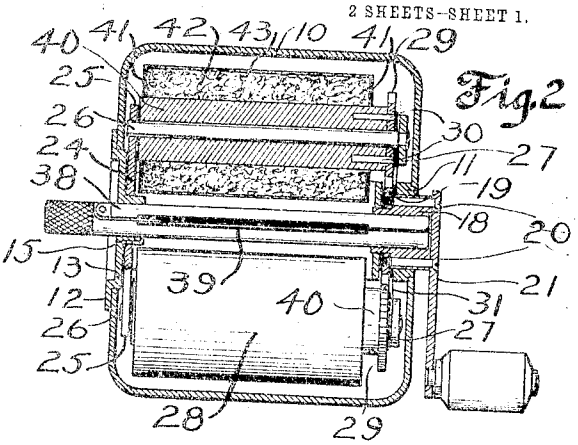

Fig. 2

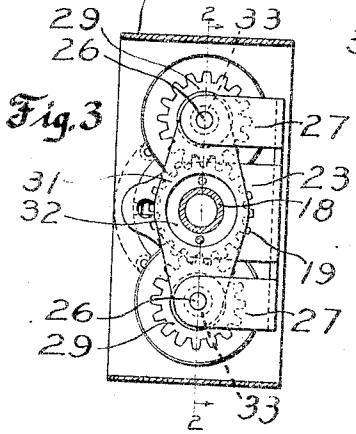

Fig. 3

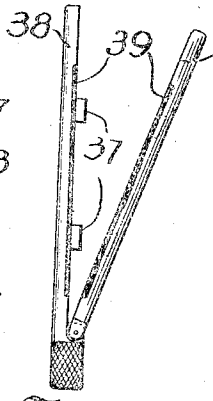

Fig. 4

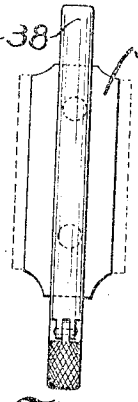

Fig. 5

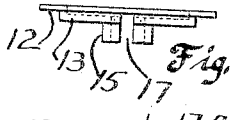

Fig. 6

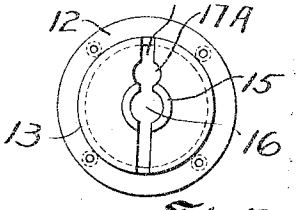

Fig. 7

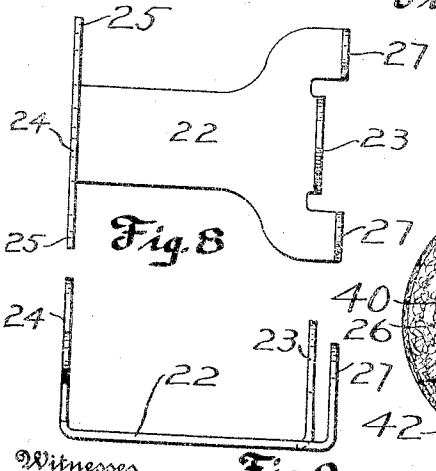

Fig. 8

Fig. 9

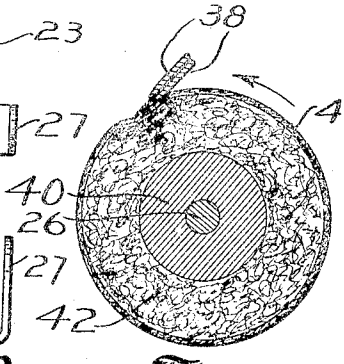

Fig. 11

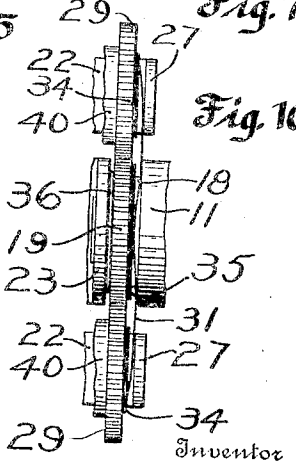

Fig. 10

Witnesses

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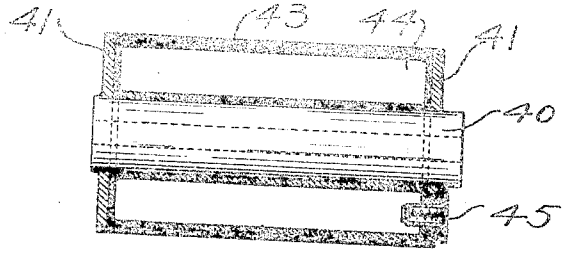

Fig. 12.

Fig. 13.

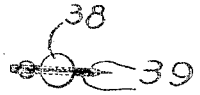

Fig. 15.

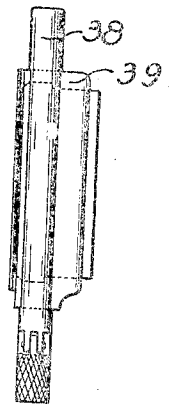

Fig. 14.

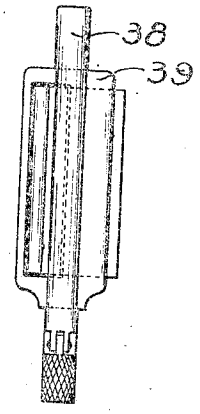

Fig. 16.

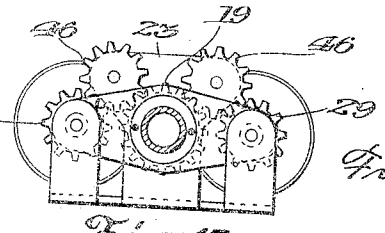

Fig. 17.

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UNITED STATES PATENT OFFICE.

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DEVICE FOR SHARPENING RAZORS.

1,044,036. Specification of Letters Patent. Patented Nov. 12, 1912.

Application filed June 9, 1911. Serial No. 632,231.

To all whom it may concern:

Be it known that I, FRANCIS K. FASSETT, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented a new and useful Improvement in Devices for Sharpening Razors, of which the following is a specification.

My invention relates to devices for sharpening or stropping razor blades of various kinds, but more especially those used in safety razors. One of its objects is to produce a device wherewith any person, however inexperienced he may be, can put as keen an edge on a blade as can be put on a blade by a skilful barber employing the most approved methods known to his art.

Another object is to make a device which will be light and compact, and require no adjustment.

These and other advantages are embodied in the construction shown in the accompanying drawing, in which:

Figure 1 is an end view of my sharpener, seen from the end at which blades are inserted, a portion of the main frame being removed; Fig. 2 is a section on line 2—2 of Fig. 3; Fig. 3 shows the geared end of the device with a portion of the main frame removed; Figs. 4 and 5 are views of a holder for one form of blade; Figs. 6 and 7 are different views of the plate which acts as a support for the carrier; Figs. 8 and 9 are views of the carrier; Fig. 10 is an enlarged view of certain parts; Fig. 11 is an enlarged transverse section of a roller; Fig. 12 is a transverse section of a roller of modified construction; Figs. 13 and 14 show a blade holder for one type of blade; Figs. 15 and 16 show a holder for another type of blade, and Fig. 17 shows a modification for the purpose of reversing the direction of rotation of the rollers.

Similar numerals refer to similar parts throughout.

Referring to the drawings, the main frame 10 has a bush 11 secured in an aperture in one of its sides, and opposite this bush a plate 12, having a projection 13, is secured to the frame 10 by screws 14, the projection extending inward through and fitting closely in a large opening in the side of the frame. The plate 12 has a second projection, 15, having a bore 16; a slot 17 bisects the projections 13 and 15. The curved recesses 17^ in the slot 17 are for a purpose which will be referred to later on.

A short, hollow shaft 18 is fitted to rotate in the bush 11, the inner end of the shaft being reduced to receive the driving gear 19, the reduced portion however, extending some distance through the gear. The gear is secured to the shaft by screws 20, the same screws also passing through and securing a crank 21 to the shaft. A carrier 22, has upturned portions 23 and 24, each of which has a bore adapted respectively to slip over the reduced end of the shaft 18 and the projection 15, thereby pivotally mounting the carrier in the main frame. The upturned portion 24 has lateral extensions 25, each of which has a hole to receive a shaft 26. The other ends of shafts 26 are turned down to form shoulders, and the reduced ends are inserted in holes formed in upturned portions 27, and their ends headed down. A roller 28 is mounted to rotate upon each shaft 26; a gear 29 is secured to each roller by pins 30 and enmeshed with the driving gear 19. Obviously, the rollers will be driven in a direction opposite to that of the gear 19; should it be desired to have the rollers rotate in the same direction as the driving gear, an intermediate gear could be interposed between the driving gear and each of the gears 29. Fig. 17 shows a modification for this purpose; the upturn 23 is enlarged to carry intermediate gears 46, which are mounted to rotate on suitable studs secured thereto. Gear 19 and gears 29, being reduced in size, are connected by the intermediate gears. Clearly, the rollers will then rotate in the same direction as gear 19.

A sheet metal spring 31, the form of which is best shown in Fig. 3, has a relatively large central aperture 32, and at each end, smaller apertures 33. The aperture 32 is large enough to slip freely over the large part of the shaft 18, while the smaller apertures permit the free passage of the shafts 26. The ends of the spring are confined between the gears 29 and the upturns 27, a fiber or other suitable washer 34 being interposed between the gears and the spring. A fiber or other suitable washer 35 surrounds the shaft 18 and is confined between the spring and the driving gear; a similar washer, 36, is interposed between the driving gear and the upturned portion 23. The

spring being bent into approximately the form shown in Fig. 10 which shows the positions of the parts, it is obvious that when the gears 29 are brought close to the upturns 27, as in Fig. 2, the effect is to press the driving gear against the upturn 23, thereby producing a frictional connection between the driving gear and the carrier 22, which causes the latter to be rocked on its pivotal supports when the driving gear is rotated. This will be again referred to later on. While in Figs. 2 and 10 the spring 31 appears to press against the end of the bush 11, it is not intended to create any friction at this point; on the contrary, the carrier should be perfectly free to rock upon its pivotal supports, and sufficient end play is afforded for this purpose.

The blade holder shown in Figs. 4 and 5 is designed to support a blade having two cutting edges; a blade is shown, in dotted lines, in place in Fig. 5. Blades of this style having apertures to locate them in the razor in which they are used, the same apertures are used to locate and hold them in place in the holder, pins 37 being secured in one member of the holder for the purpose. The other member of the holder has pockets to receive the ends of the pins when the holder is closed. The holder comprises a cylindrical central portion 38 adapted to pass through the bore 16 in plate 12 and enter the hollow shaft 18, as shown in Fig. 2. This portion of the holder is formed of two half round portions hinged together as shown; each half round part has a recess formed in its inner face in which a thin plate 39 is secured, which plates extend laterally to a point near the cutting edge of the blade.

The upturned portion 24 of the carrier has slots 39, radiating from opposite sides of the aperture through which the projection 15 passes. When the carrier is in the position shown in Fig. 3, these slots register with the slot 17 in the plate 12, and the holder, with a blade in place may be inserted at this time. Referring to Fig. 2, it will be seen that the crank acts as a stop for the blade holder, and that when the holder is in its proper position, the plates 39 have passed beyond the upturned portion 24, thereby leaving the carrier free to rock. But the plates are too long to quite emerge from the slot in the projection 15, and the extremities of the slotted projection prevent the holder from rotating. After the blade is in place in the sharpener, the crank is turned forward and backward, a few turns in each direction, this alternate rotating being continued until a keen edge has been imparted to the blade. The first movement of the crank in either direction does nothing but rock the carrier, which will continue to rock until a roller comes into contact with the blade; the continued movement of the crank thereafter causes the rollers to rotate. The frictional connection between the driving gear and the carrier, not only causes the carrier to rock, but, after the rollers have engaged the blade and begin to rotate, this frictional connection causes the rollers to be pressed against the blade. When a double edged blade is in the sharpener, one roller acts upon each edge of the blade, simultaneously, as is shown in Fig. 1. In this figure, supposing the gears to be directly enmeshed as in Fig. 3, the rollers will rotate in the direction indicated by the arrows; when the direction of rotation of the crank is reversed, the carrier will be rocked in the direction of the arrow shown on the dotted arc, and the rollers will be moved over into the positions indicated by dotted circles, where they will rotate in the direction indicated by the arrow points on said circles. In a general way it may be stated that the degree of pressure of the rollers against the edges of the blade will depend upon the drag imparted to the carrier by its frictional connection to the driving gear; while this drag creates the initial pressure, the friction produced by the surface of the roller rubbing against the blade tends to retard the roller, which retardation, acting through the gears, supplements the drag produced by the frictional connection and augments the pressure of the roller against the blade. This augmentive or secondary friction, which increases as the speed of the rollers increases, is sufficient to warrant the primary friction, *i. e.*, the frictional connection, being comparatively slight; it is also worthy of note that the primary friction is somewhat augmented by the friction produced between the ends of the rollers and the ends of the spring 31.

When a barber strops a razor, he does not pull his strop as taut as he can; instead he allows the strop to sag under the pressure of the blade, the result being that the cutting edge of the blade lies in a depression, this depression of course following the edge of the blade as it moves over the surface of the strop. In other words, the strop curves around the cutting edge of the blade to an extent depending upon the tautness of the strop. This is not a mere accident, nor is it due to lack of means for keeping the surface of the strop flat; rigid razor strops have been made, and are now obtainable in the market, but their use is practically confined to the inexperienced and such strops are rarely if ever used by barbers. The inexitable conclusion is that best results are obtained by having the strop curve around the edge of the blade. To obtain a similar condition with the use of the rollers, whose curved surfaces are just the opposite to what is desired, I prefer to construct the strop-

ping rollers in a manner which will now be described.

Referring to Fig. 2, the roller shown in section has a central core 40, having a bore to receive the shaft 26. A circular disk 41 is secured to each end of the core and the space between the disks is filled with an elastic material 42, over which is placed a leather covering 43. This covering may be treated by some one of the many processes wherewith razor strops are treated, and it is preferable to have the leather skived down to a thickness which will render it very pliable. The edges of the leather, after being scarfed, should be lapped and cemented together; at each end of the roller the leather may be cemented or otherwise secured to the disks 41. The rollers are of such length that they will accommodate the blade and leave a reasonable distance between its ends and the disks 41, thereby affording ample opportunity for the blade to form a depression in the surface of the roller. Various substances are adapted to be used for the filler 42, among which are felt and spongy rubber. A composition similar to that used in making inking rollers for printing presses may also be used. In Fig. 12 is shown a pneumatic roller, in which a rubber bladder 44 is confined between the disks 41. The bladder may be inflated in the same manner as are pneumatic tires, the air pump connection 45, being of substantially the usual type. Fig. 11 is a transverse section of a roller showing exaggeratedly, the action of the blade upon the roller, from which will be seen that the blade is acted upon in substantially the same manner as is the barber's blade. The advantage of making the plates 38 broad enough to reach nearly to the edge of the blade is apparent, especially in the case of double edged blades which are very thin and flexible.

In Figs. 13 and 14 are shown a holder for a blade belonging to a well known safety razor; Figs. 15 and 16 show a holder for another well known razor. Each of these razors use single edged blades, but, obviously, the action of the sharpener is the same as has been described, save that but one roller acts at a time. The recesses 17^A in the plate 12, and the like recesses 39^A in the slot 39 permit the passage of the enlarged part of the blade shown in Figs. 15 and 16. Inasmuch as the blade is stationary while the sharpener is actuated, this device is clearly not confined to sharpening blades that can be separated from their handles or other supports; with slight modification in the form of the holder, the device may be adapted to sharpen the so called "old-style razors."

While the detailed views of the rollers all show constructions for a stropping roller, it is clear, and I want it to be understood, that my invention is not confined to use as a stropping device, as, by substituting other rollers, cylindrical hones for example, the same mechanism is adapted to use for honing razors. Furthermore, though the embodiment of my invention herein shown and described is intended for use principally by users of razors, the principles employed are applicable to a machine for sharpening razor blades on a commercial scale, even in a power driven, instead of a manually driven device.

While the mechanism herein shown and described constitutes a preferred form of embodiment of my invention, it is to be understood that other forms might be used, and yet come within the scope of the appended claims.

What I claim is as follows:

1. In a razor sharpener of the character described, a stationary blade holder, a pivoted frame, a sharpening roller journaled in said frame, a driving pinion rotatably supported adjacent the blade holder, and in alinement with the axis of the pivoted frame, a pinion carried by the sharpening roller and meshing with said drive pinion, and frictional means tending to hold said sharpening roller against rotation.

2. A razor sharpening device comprising a main frame, a carrier pivotally mounted upon said main frame, a pair of rollers mounted upon the carrier, their axes being parallel with that of the carrier, a blade holder carried by the main frame, a driving gear mounted with its axis in alinement with that of the carrier, means for rotating said carrier, gears mounted upon the rollers and driven by the driving gear, and a frictional connection between the driving gear and the carrier whereby, when the driving gear is rotated in one direction, the carrier is rocked and one of the rollers caused to contact with the cutting edges of a blade carried by the blade holder, and when said gear is rotated in the other direction, the other roller is caused to contact with the opposite edge of said cutting edge, the continued rotation of the gear in either direction causing the rollers to rotate.

3. A razor sharpening device comprising a main frame, a carrier pivotally mounted upon said main frame, a pair of rollers mounted upon the carrier, their axes being parallel with that of the carrier, a blade holder adapted to hold a blade having two cutting edges carried by said frame, a driving gear mounted with its axis in alinement with that of the carrier, means for rotating said gear, gears mounted upon the rollers and driven by the driving gear, and a frictional connection between the driving gear and the carrier whereby when the driving gear is rotated in one direction the carrier

is rocked and the rollers caused to contact with the cutting edges of a two-edged blade carried by the blade holder, one roller engaging each edge, and when the driving gear is rotated in the opposite direction the carrier is rocked and each roller caused to contact with the side of the cutting blade that cannot be engaged by the other roller, continued rotation of the driving gear in either direction causing the rollers to rotate and simultaneously act upon each edge of the blade.

4. A razor sharpening device comprising a main frame, a carrier pivotally mounted upon said main frame, a pair of rollers mounted upon the carrier, their axes being parallel with that of the carrier, said rollers having embodied in their construction material of such a character as to give them elastic properties, a blade holder carried by the main frame, a driving gear mounted with its axis in alinement with that of the carrier, means for rotating said gear, gears mounted upon the rollers and driven by the driving gear, and a frictional connection between the driving gear and the carrier, whereby when the driving gear is rotated in one direction, the carrier is rocked, and one of the rollers caused to contact with the cutting edge of a blade, held by the blade holder, and when said gear is rotated in the other direction, the other roller is caused to contact with the opposite side of said cutting edge, the continued rotation of the gear in either direction causing the rollers to rotate.

5. A razor sharpening device comprising a pair of sharpening rollers, a stationary blade holder adapted to hold a blade having two cutting edges, means for moving the rollers, one to engage and press against the side of one cutting edge and the other to simultaneously engage and press against the opposite side of the other cutting edge, means for moving the rollers to engage simultaneously and press against the remaining side of the cutting edge, each roller remaining on and engaging the same side of both cutting edges, and means for rotating the rollers.

6. In a razor sharpener of the character described, a main frame, means for fixedly supporting a double edged blade in said main frame, a carrier pivotally supported in said main frame concentric to the axis of said blade holder, a pair of spaced sharpening rollers journaled in opposite portions of said carrier, and means for rocking the carrier to cause the rollers thereof to alternately engage the cutting edges of a double edged blade supported in said frame, each roller engaging the same side of both cutting edges.

7. In a razor sharpener device of the character described, a main frame, an open carrier supported therein, a pair of parallel spaced rotatable sharpening rollers journaled in said carrier, a blade holder for supporting a double edged blade positioned between the sharpening rollers of said carrier and extending parallel thereto, and means for shifting said carrier and blade holder one relatively to the other to cause the sharpening rollers of the carrier to alternately contact with the opposite faces of the cutting edges of a blade carried by said blade holder.

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