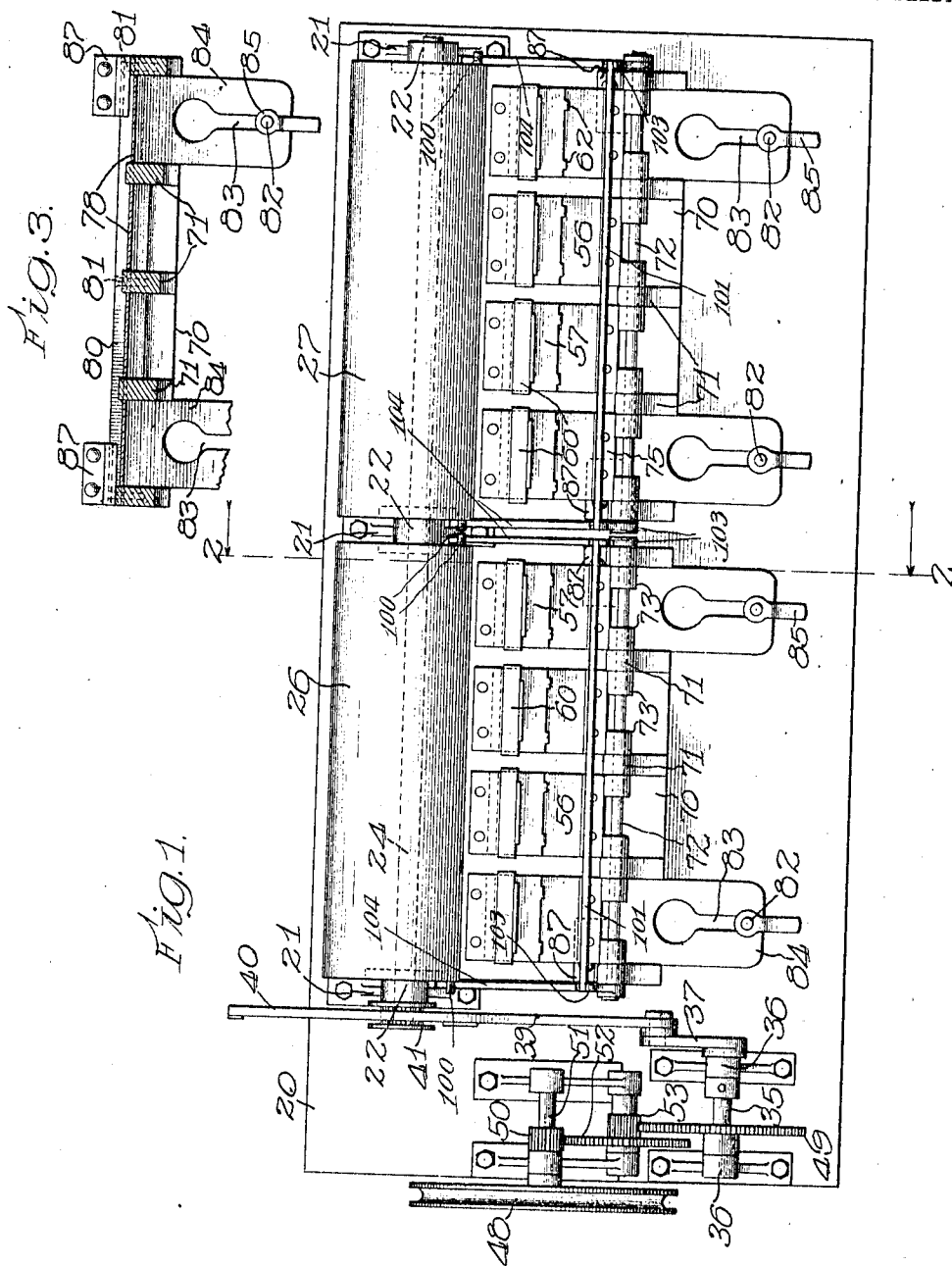


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APPLICATION FILED AUG. 29, 1911.

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Patented Dec. 31, 1912.

2 SHEETS-SHEET 1.



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Inventor  
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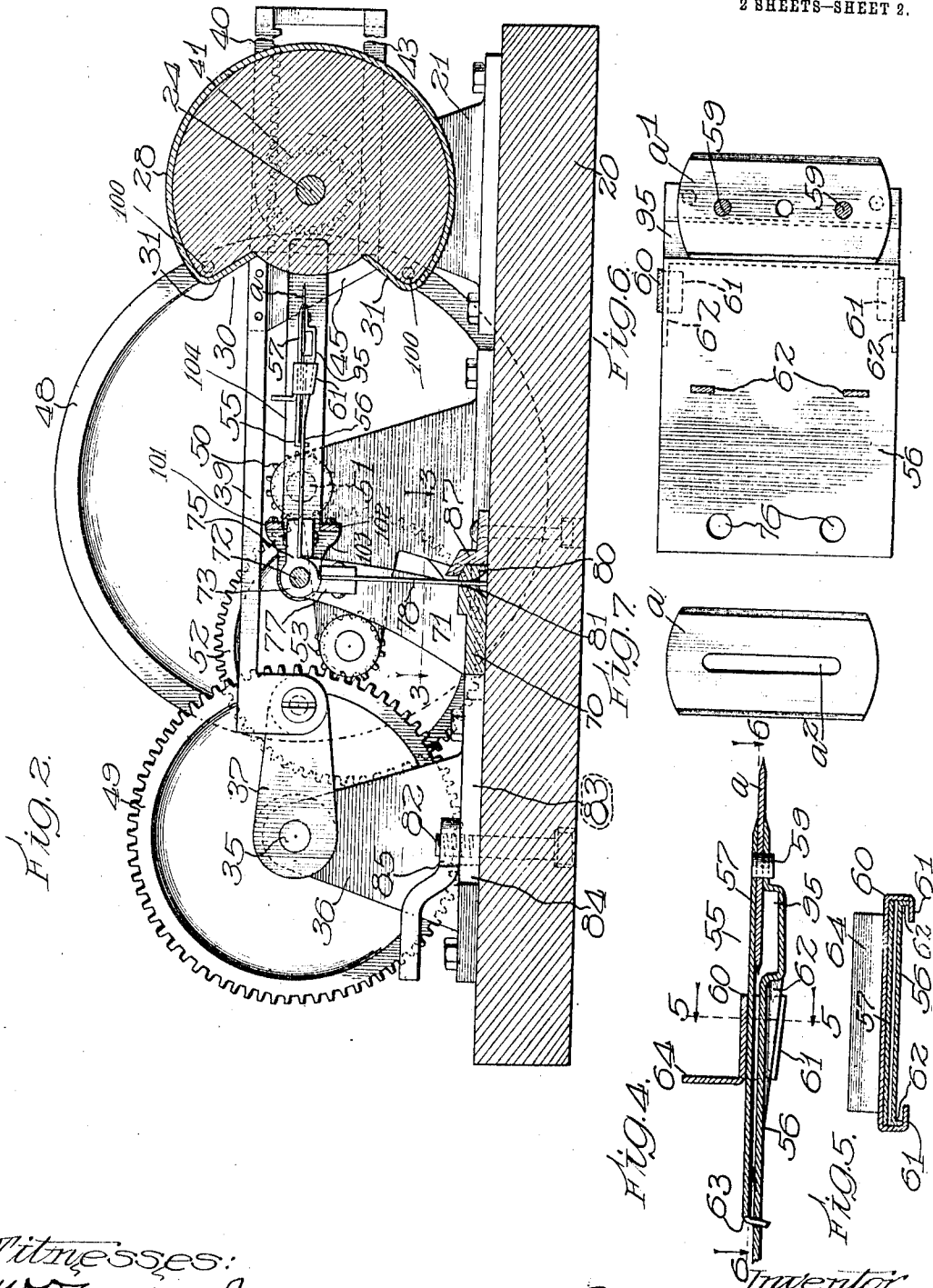
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# UNITED STATES PATENT OFFICE.

CLAUD C. MUTH, OF CHICAGO, ILLINOIS.

MACHINE FOR SHARPENING SAFETY-RAZOR BLADES.

1,048,571.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed August 29, 1911. Serial No. 646,743.

*To all whom it may concern:*

Be it known that I, CLAUD C. MUTH, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Sharpening Safety-Razor Blades; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in machines for sharpening safety razor blades.

Among the objects of the invention is to provide an exceedingly simple and compact machine for efficiently and rapidly sharpening razor blades, and one in which a number of blades may be sharpened at one time.

Other objects of the invention are to provide a novel form of sharpening roller and mechanism for operating the same, and to provide novel means for presenting the blades to and holding them against the roller.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the drawings,—Figure 1 is a top plan view of a razor blade sharpening machine embodying my invention. Fig. 2 is an enlarged section thereof on the line 2—2 of Fig. 1, showing a razor blade in position in one of the holders. Fig. 3 is a detail section on line 3—3 of Fig. 2. Fig. 4 is a longitudinal vertical sectional view of the blade holder. Fig. 5 is a detail section on line 5—5 of Fig. 4. Fig. 6 is a longitudinal section on line 6—6 of Fig. 4. Fig. 7 is a plan view of one type of razor blade adapted to be held by said holder.

As shown in the drawings, 20 designates the base of the machine which is provided at one side near the ends thereof and near its center with standards 21, 21 having bearings 22 to receive a shaft 24 on which are fixed the two sharpening rollers 26, 27 of the machine. The bodies of said rollers may be made of wood or like material, and are each covered with suitable sharpening surfaces, such as a layer 28 of leather or other suitable material, against which the edges

of the blades are pressed, when the rollers are turned, to properly sharpen the blades. The sharpening surface of one of the rollers may be treated with a suitable substance to give an abrasive effect thereto, and the blades will be first applied to the roller thus treated to preliminarily sharpen them. The surface of the other roller is smoother so as to give a finished sharpening effect to the razor blades. The surfaces of the two rollers, in this respect, resemble the two surfaces of a razor strop for sharpening an ordinary straight blade razor. The rollers 26 and 27 are not true cylinders, but each of said rollers is longitudinally cut away or recessed at one portion of its circumference, as indicated at 30 in Fig. 2, and the sharpening surface layers 28 are continued over into the recessed portions of the rollers, as indicated at 31, to constitute two elongated flat sharpening surfaces which lie one at each side of the recess and disposed at oblique angles with respect to each other. The rollers are operatively connected with a suitable gear mechanism so as to be rotated first in one direction and then the other, the rollers being thus rotated throughout one complete rotation in one direction at each impulse of the driving mechanism and then reversed and rotated throughout a complete rotation in the other direction. Suitable holders, hereinafter to be described, are provided for presenting the razor blades to and holding them against the sharpening surfaces of the rollers during the rotary reciprocatory movement of the rollers.

Referring now to the driving mechanism for imparting rotary reciprocatory motion to the rollers, the same is made as follows:— 35 designates a short, rotative crank shaft which is mounted in bearings carried by standards 36, 36 which rise from the base 20 at one side and near one end of the base. Said shaft is provided at its inner end with a crank arm 37 which is pivotally or loosely connected with one end of a reciprocatory bar 39, which bar carries at its opposite end a rack 40 having downwardly facing teeth which engage a pinion 41 that is fixed to the adjacent end of the roller shaft 24. Preferably said rack bar is provided with a yoke, consisting of a lower member 43 which is connected to the rack

bar by the vertical members 44, 45, and said lower member 43 opposes the lower side of the pinion 41 so as to guide the rack and hold it in mesh with the pinion 41. The crank shaft 35 is geared to a driving pulley 48 that may be connected with any suitable power motor or a hand operated device (not shown) through the medium of a train of gears comprising a gear wheel 49 on the crank shaft, a pinion 50 on the shaft 51 of the power pulley and the intermediate gear wheel and pinion 52, 53, respectively. With this construction when the crank shaft 35 is rotated continuously in one direction, through its connection with the power pulley 48, it will operate, through the crank 37, the rack 40 and pinion 41, to impart a rotary reciprocatory motion to the sharpening rollers in the manner before indicated.

The razor blades to be sharpened are presented toward the sharpening rollers by suitable holders so arranged that the blades are held with their beveled edges, at one side thereof, against the sharpening surfaces of the rollers when said rollers are rotated in one direction, and are held with the other side of their beveled edges against the sharpening surfaces of the rollers when said rollers are rotated in the opposite direction; said blades being held out of contact with the sharpening surfaces of the rollers at the time the direction of rotation of the rollers is reversed. As herein shown the release of the blades from the sharpening surfaces of the rollers is effected by the longitudinally recessed portions 30 of the rollers, combined with yieldingly mounted blade holders designated in Figs. 1, 2, 4, 5 and 6 by 55. Each of the blade holders comprises a lower plate 56 and an upper plate 57, between the inner ends of which the blade  $a$ , or  $a'$ , is adapted to be clamped; said upper plate 57 being provided with studs 59 adapted to extend through the elongated opening  $a^2$  of the blade  $a$ , (Fig. 7) or through the spaced openings of the blade  $a'$ , as shown in Fig. 6. The upper and lower plates or members 56 and 57 of the holder are pressed together to clamp a blade between the same by means of a clamping member 60 which lies over the upper plate or member and is provided at its ends with flanges 61 which are turned beneath the lower plate or member 56 to engage inclined or tapered ribs 62 at the sides of the lower face of the plate 56, as shown most clearly in Figs. 4 and 5, so as to press the inner sides of the plates 56 and 57 upon the interposed blade. The said upper plate 57 of the blade holder may be hinged to the lower plate or member in any suitable manner to permit the members to be separated for the insertion of the blades into and their removal from the holder. As herein shown, the upper plate 57 is provided with downturned lugs 63 that extend through open-

ings in the lower plate to constitute the hinge connection described. The clamping member 60 is provided with a finger piece 64 which is grasped between the thumb and finger to slide the clamp into and out of its locking or clamping position. When said clamping member is moved toward the free margins of said plates 56, 57 said plates are clamped upon the interposed blade, and when it is slid rearwardly the plates may be separated to release the blade therefrom.

The blade holders are mounted on resilient supports carried by the base 20 which are arranged to project the blades into the recessed or cut away portions of the sharpening rollers, while permitting the blades and their holders to yield backwardly as the rollers are turned to bring their sharpening surfaces in contact with the blades; the resiliency of the supports serving to yieldingly hold the blades pressed against said sharpening surfaces. The supports for the blade holders herein shown are made as follows:—70, 70 designate plates which lie flat on the base 20 in front of the sharpening rollers. They are provided with upstanding standards 71, 71 in which are mounted horizontal pivot rods 72, 72 for the double arm pivotal supports 73 of the blade holders. The blade holders are attached to the horizontal arms 75 of the pivotal supports 73 by means of bolts or rivets which extend through openings 76 in the rear ends of the lower plates or members of the holders. To the vertical members 77 of the double arm pivotal supports are attached springs 78, the lower ends of which are fixed in any suitable manner to the base. As herein shown, said lower ends of the springs 78 are clamped or pinched between the inner margins of the plates 70 and clamping bars 80 which latter are clamped to edges of the plates 70 by the clamping screws 81. The said plates 70 and the clamping bars 80 are rounded at their lower sides, as shown in Fig. 2, and pinch or clamp the springs at their upper sides only. The plates 70 are locked in place on the base 20 by means of the clamping bolts 82 which extend through slots 83 of arms 84 of said plates and through openings in said base. The bolts 82 are provided with clamping nuts 85 provided with finger pieces or levers by which to turn the nuts down upon the arms 84. Clips 87, bolted to the base 20, serve to limit the movement of the plates 70, and thereby the blade holders 55, toward the sharpening rollers. The slotted arms 84 of said plates 70 enable the plates to be removed from the base, without the necessity of removing the clamping nuts 85, it being necessary to only slightly release said clamping nuts and shift the plates rearwardly to positions to permit the slotted arms 84 to pass over the lever nuts 85. Thus an entire set of blade holders, with the blades therein,

may be removed from one side of the machine and attached to the other side of the machine, so that thereby the blades may be successively acted upon by the rollers without the necessity of removing the blades from the holders.

The operation of the machine is as follows:—The driving mechanism for the sharpening rollers is so arranged that at the time of reversal of direction of the rollers the recessed portions 30 of the rollers are presented inwardly and the blades are presented toward said recessed portions between the oblique surfaces 31 at the sides of the recesses. This is the position of the parts shown in Fig. 2. If the rollers be now rotated in either direction the plane oblique surfaces of the rollers will be brought against the blades at one side thereof, and, by reason of the pivotal, yielding mounting of the blade holders the latter will swing out of their normal horizontal planes into position to permit the blades to pass in contact with the curved circumferential surfaces of the rollers. The blades will be pressed yieldingly in contact with said surfaces of the rollers until the rollers are turned to again bring the recesses 30 thereof inwardly, whereupon the blades will pass from the curved circumference of the rollers over the oppositely located plane oblique surfaces 31 and into said recesses and be released from the sharpening surfaces of the rollers. The direction of rotation of the rollers will now change or be reversed so that the sharpening surfaces of the rollers will be brought in a reverse manner against the opposite sides of the beveled edges of the blades, and the blades will be yieldingly pressed against the sharpening surfaces of said rollers until the recess 30 is again presented toward the blades. While the blades are thus pressed against the sharpening surfaces of the rollers the springs 78 will curve or bow between their ends, and when the recessed portions of the rollers are presented toward the blades the springs straighten out and bring the blade holders to their normal horizontal position.

The arrangement described permits a single sharpening roller to operate alternately on the opposite sides of the blade, and with the use of a very simple blade holder supporting means.

It will be noted that the blades are released from the sharpening surfaces of the rollers at a time when the rollers are traveling at a relatively slow speed or at a time when the crank arm 37 is approaching and receding from a dead center. This arrangement makes it practicable to release a blade from its holder at such time of reversal and without stopping the machine.

The form of blade holder shown makes it practicable to employ the same lower mem-

ber or plate 56 and the same clamping device 60 with a variety of different types of safety razor blades, it being only necessary to vary the upper plate or member to adapt the holder to different blades.

I provide means for deflecting the holders and the blades carried thereby to move the blades out of contact with said rollers at the angles between the cylindric and oblique surfaces of said rollers when said angular portions of said rollers are passing said blades. The mechanism which I have shown for accomplishing this result is controlled directly from the movement of the rollers and is made as follows: Each roller is provided at each end thereof with two pins 100, 100 located at the angles between the cylindric surface of the roller and the oblique surfaces 31 thereof, said pins extending outwardly from the roller ends parallel with the axes of the rollers. Arranged above and below the horizontal arms of the pivotal supports of the blade holders are upper and lower bars, 101, 102, respectively, that are attached at their ends to fittings 103, which are pivotally mounted on the pivot rods 72 of the blade holder supports. Said fittings 103 are provided with forwardly extending arms 104, the forward ends of which extend into the path of the pins 100 at the ends of the rollers. During the rotary reciprocatory motion of said rollers, the pins 100 strike the forward ends of the arms 104 and depress or raise said arms (depending upon the direction of rotation of the rollers), and thereby, through the bars 101 and 102 effect a corresponding raising or depression of the blade holders so as to deflect the blades out of the path of the rollers at the time the angular portions of the rollers pass said blades, or just before the edges of the blades ride upon or leave the cylindric portions of the rollers. This arrangement prevents the edges of the blades passing around the sharp angular portions of the rollers in a manner to turn the edges of the blades.

I claim as my invention:

1. In a machine for sharpening safety razor blades, a rotary reciprocatory sharpening device, provided with a recess, and means for yieldingly supporting a razor blade in position to project into said recess.

2. In a machine for sharpening safety razor blades, a sharpening roller provided with a longitudinal recess, means for imparting a rotary reciprocatory motion to said roller, and means for yieldingly supporting a razor blade in position to project into the recess of the sharpening roller.

3. In a machine for sharpening safety razor blades, a sharpening roller provided with a longitudinal recess, gearing for turning said roller first in one direction and then in the other, constructed to reduce the

speed of the roller at its points of reversal, and means for yieldingly supporting a razor blade in position to project into the recess of the sharpening roller.

5 4. In a machine for sharpening safety razor blades, a sharpening roller provided with a longitudinal recess, means for imparting a rotary reciprocatory motion to said roller, and a pivotally mounted, resiliently supported holder for holding a razor  
10 blade in position to project into the recess of said roller.

5. In a machine for sharpening safety razor blades, a longitudinally recessed sharpening roller, means for imparting rotary reciprocatory motion to said roller, and a horizontally arranged holder adapted to support a razor in position to project into the recess of the sharpening roller, said holder  
15 being pivotally supported to swing vertically, and a spring applied to the holder to normally maintain it in horizontal position, but permitting it to yield vertically in either direction.

25 6. In a machine for sharpening safety razor blades, a sharpening roller provided with a curved sharpening surface, and with a longitudinal recess, and with plane oblique faces arranged at the sides of said recess, means for imparting a rotary reciprocatory  
30 motion to said roller, and a blade holder adapted to yieldingly support a blade in position to project into the recess of said roller.

7. In a machine for sharpening safety razor blades, a sharpening roller provided with a longitudinal recess, and with a pinion, a to and fro reciprocatory rack bar engaging said pinion, means for reciprocating said  
35 bar, and a yieldingly supported blade holder adapted to support a blade in position to project into the recess of the roller.

8. In a machine for sharpening safety razor blades, a longitudinally recessed sharpening roller provided with a pinion, a  
45 to and fro reciprocatory rack bar engaging said pinion, a crank shaft having a crank which is pivotally connected to the rack bar, and a blade holder adapted to yieldingly support a blade in position to project into the recess of said roller.

9. In a machine for sharpening safety razor blades, a sharpening roller capable of rotary reciprocatory motion and provided with a longitudinal recess, a blade holder  
55 adapted to yieldingly support a blade in position to project into the recess of said roller, and means for imparting rotary reciprocatory motion to said roller, arranged to reverse the direction of rotation of the roller, and thereby reduce the speed thereof  
60 when the recessed portion of the roller is turned toward the blade holder.

10. In a machine for sharpening safety razor blades, a base, a shaft mounted thereon  
65 and capable of rotary reciprocatory motion,

means for actuating the shaft to rotate it first in one direction and then in the other, two sharpening rollers fixed in endwise relation to said shaft, each of said rollers being provided with a longitudinal recess, two sets  
70 of blade holders, one for each of said rollers, said holders being adapted to yieldingly support razor blades in position to project into the recesses of said holders, and means for supporting the blade holders on the base,  
75 comprising means to separately fix the sets to the base whereby either set of holders may be separately released from the base to present the same toward either of said sharpening rollers.

11. A machine for sharpening safety razor blades comprising a base, a sharpening roller mounted thereon capable of rotary reciprocatory motion, with means for actuating the roller to rotate it first in one direction and then the other, a plate removably supported  
85 on the base, a shaft mounted on said plate, a plurality of blade holders pivoted to said shaft and directed toward the sharpening roller and springs applied to said holders and confined between said plate and a clamping surface on the base to yieldingly support the blade holders.

12. A machine for sharpening safety razor blades comprising a sharpening roller capable of rotary reciprocatory motion, with means for imparting rotary reciprocatory motion thereto, said roller being provided with a longitudinal recess, a pivoted blade holder for presenting a blade to and pressing it against said roller, an arm extending from said blade holder toward the roller, and pins on the end of the roller, one at each side of said longitudinal recess for engagement with said arm, as and for the purpose  
105 set forth.

13. A machine for sharpening safety razor blades comprising a sharpening roller capable of rotary reciprocatory motion, with means for imparting rotary reciprocatory motion thereto, said roller being provided with a longitudinal recess, a series of pivoted blade holders for presenting blades to and pressing them against the roller, upper and lower bars arranged above and below  
115 said blade holders, an arm connected to and extending forwardly from said bars with its end adjacent to the end of said roller, and projections on the end of said roller, one at each side of said recess, for engagement with said arms.

14. In a machine for sharpening safety razor blades, a sharpening device provided with a sharpening surface and a recess, means for rotating said sharpening device  
125 first in one direction and then in the other, means for yieldingly supporting a razor blade in position to project into said recess and to press against said sharpening surface when the latter is brought in contact there-  
130

with by rotation of the sharpening device,  
and means for withdrawing the blade from  
the angular portions of the sharpening de-  
vice between the recess and sharpening sur-  
5 face.

In testimony, that I claim the foregoing as  
my invention I affix my signature in the

presence of two witnesses, this 9th day of  
August A. D. 1911.

CLAUD C. MUTH.

Witnesses:

W. L. HALL,  
G. E. DOWLE.