April 12, 1927. 1,624,592

G. D. GALLAGHER

BLADE STROPPING DEVICE

Original Filed Aug. 5, 1919 2 Sheets-Sheet 1

Fig. 1.

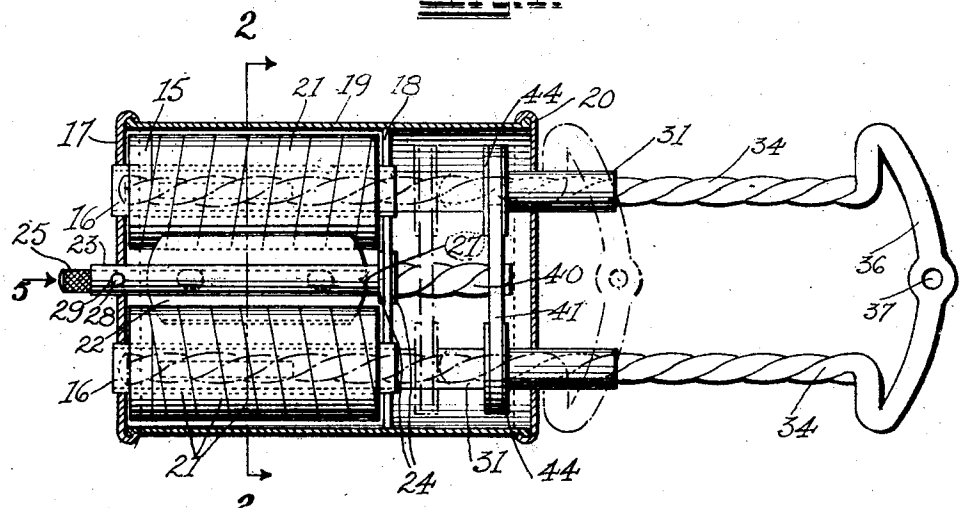



Fig. 3.

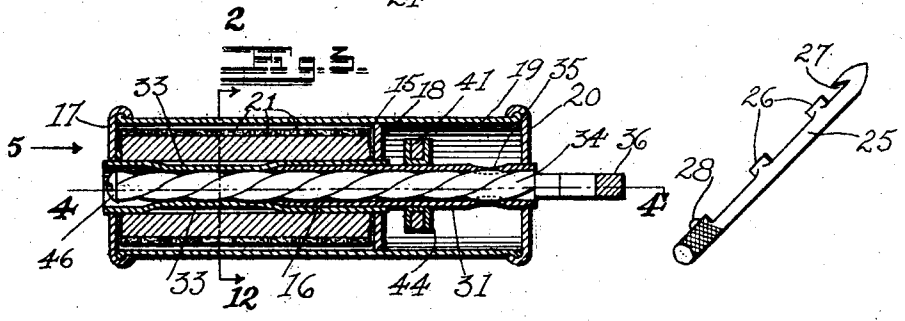



Fig. 5.

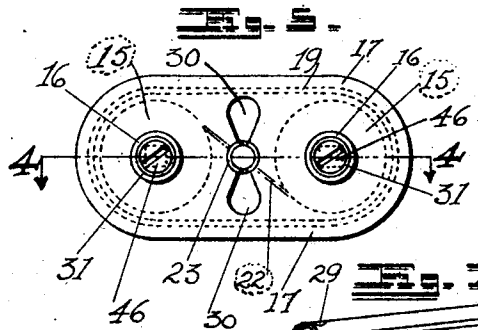



Fig. 2.

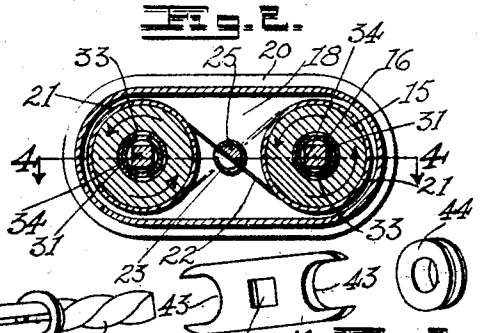



Fig. 7.

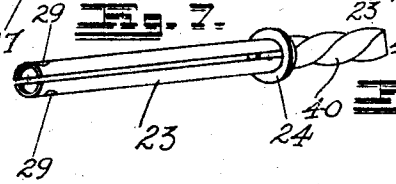



Fig. 8.

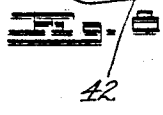



Fig. 9.

Inventor
George D. Gallagher
By Bradford Morrell & Brennan
Attorneys

April 12, 1927. 1,624,592

G. D. GALLAGHER

BLADE STROPPING DEVICE

Original Filed Aug. 5, 1919 2 Sheets-Sheet 2

Fig. 4.

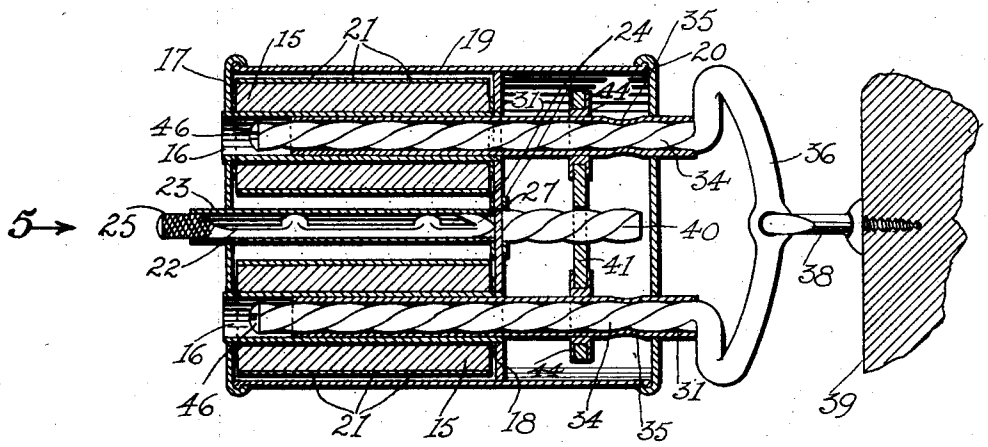



Fig. 11.

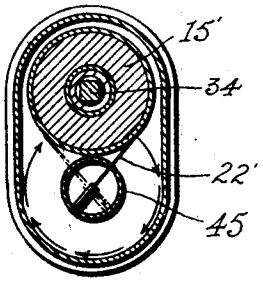



Fig. 10.

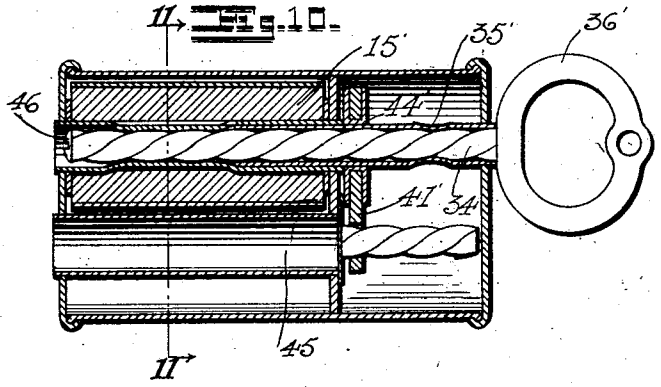



Fig. 12.

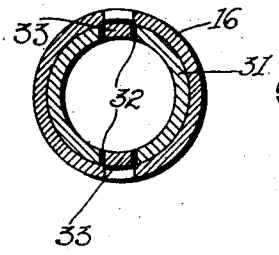
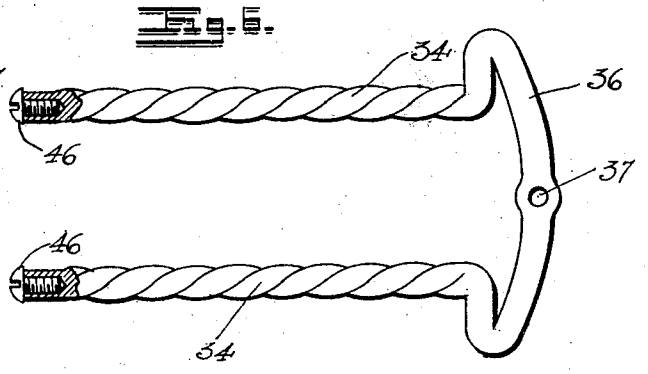



Fig. 5.




Inventor
George D. Gallagher.
By Bradford Morrill & Birman
Attorneys

Patented Apr. 12, 1927. 1,624,592

# UNITED STATES PATENT OFFICE.

GEORGE D. GALLAGHER, OF PHOENIX, ARIZONA, ASSIGNOR, BY MESNE ASSIGNMENTS OF PART INTERESTS, TO NANNIE F. HOOS, RUTH B. WALTEN, BOTH OF BALTIMORE, MARYLAND; CALLIE F. MOORE, OF WASHINGTON, DISTRICT OF COLUMBIA; AND J. MARCH MATTHEWS, OF BALTIMORE COUNTY, MARYLAND.

## BLADE-STROPPING DEVICE.

Application filed August 5, 1919, Serial No. 315,517. Renewed August 22, 1925.

This invention relates to stropping devices for razor blades and has for an object to provide a device embodying new and improved features of convenience of operation, compactness of structure, and efficiency of operation.

A further object of the invention is to provide a stropping device adapted for pocket use or transportation in hand luggage or the like, designed to occupy a minimum of space for maximum efficiency.

In my prior Patent No. 1,319,149, granted October 21, 1919, the stropping rolls and blade holder have an endwise shifting movement during the blade oscillating movements. One of the principal objects of the present invention resides in providing a construction wherein the stropping rolls and blade holder are free of such axial movement.

Still another object of this invention resides in modifying the structure of my prior invention by eliminating at one end of the casing the projecting ends of the sleeves which carry the stropping rolls.

Another object resides in avoiding the use of the inner roll carrying carriage which, while having certain advantages of construction, is to an extent objectionable, in that it provides an additional second casing through which the blade must be withdrawn endwise.

A further object of this invention resides in the provision of separate sleeves which telescope within the stropping rolls during the blade shifting operation, and which sleeves form relatively long bearings to prevent lateral play of the spiral driver.

A further phase of the invention resides in the slotted sleeves and in the manner in which they form the driving connection between the stropping rolls and the spiral driver whereby to permit the shifting of the blade into contact with the stropping rolls so as to provide a driving connection for the rolls.

A further phase of this invention resides in shifting the blade holder by providing a working contact between the blade holding spiral and a member in the enclosing casing instead of having the blade holding spiral work through an aperture in the casing as in my prior patent.

An additional object lies in the specific construction of the means by which the spiral of the blade holder is shifted by the endwise movements of the sliding sleeves surrounding the spiral driver.

An additional feature of the invention resides in the means for holding the blade holder from accidental endwise movement while permitting its free withdrawal when the blade is to be pulled out of the casing.

A final object of this invention is to provide a construction in which a single stropping roll is used in connection with a blade holder for a single edge blade together with an enclosing casing which permits the opposite sides of the blade edge to contact with the roll.

With these and other objects in view the invention comprises certain novel constructions, units, combinations and arrangements of parts, as will hereinafter be more fully described and claimed.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a view of the device in top plan with the casing in section and the parts extended to their limit;

Figure 2, a transverse sectional view through the device taken on line 2—2 of Figure 1;

Figure 3, a section taken on line 3—3 of Figure 1 with the parts closed into the minimum space;

Figure 4, a longitudinal sectional view taken on line 4—4 of Figures 2 and 3;

Figure 5, a view of the device in end elevation, as indicated by arrow 5 at Figures 1, 3 and 4, and showing line 4—4 the plane of Figure 4;

Figure 6, a detail plan view of the worm drive member;

Figure 7, a perspective view of the blade holder support;

Figure 8, a perspective view of the yoke actuating the blade holder support;

Figure 9, a perspective view of the collar engaging the yoke;

Figure 10, a longitudinal sectional view through the type for stropping a blade of the single edged type;

Figure 11, a transverse sectional view through the type and taken on line 11—11 of Figure 10; and

Figure 12 is an enlarged detail sectional view showing the manner of connecting the roller with the sleeve, taken on line 12—12 of Figure 3.

The main difference between the present invention and that shown in my prior Patent No. 1,319,149 of October 21, 1919, resides in a construction whereby the stropping rolls and blade holder are held from endwise movement in the enclosing casing. Certain other important details of construction will be evident from the sub-joined description. In the drawings, the invention embodies both a single edge and double edge stropper for stropping the double edge type of blade comprises a pair of spaced rolls 15, which are preferably, though not necessarily, constructed of wood or similar material, and are mounted on hollow cores 16. Cores 16 serve as journals for the rolls which are journalled at one end in the end cap 17 of the support which in the present instance is formed as an enclosing casing and at the opposite end in a partition 18 extending across the body of the casing 19 and held in place as desired. At the other end of the casing, a second end cap 20 is provided similar to the end cap 17 in most respects.

The length of the rolls 15 is such that they are held with reasonable freeness of rotation between the end cap 17 and the partition 18, and are covered with any approved stropping material which is indicated as leather, for instance, secured to the rollers in spiral strips 21. It is obvious therefore that given the proper rotation, the rolls 15 with their stropping material 21 will engage and strop a blade 22 properly positioned between the rollers and provided with means for oscillating such blade to bring its edges into successive engagement with the rotating rollers. For the purpose of positioning the blade, a blade holder support 23 in the form of an oppositely slitted tube shown in perspective at Figure 7, is journalled in the end cap 17 and partition 18. Preferably this is accomplished by means of collars 24 rigidly mounted upon the tubular member 23 and spaced upon opposite sides of the partition 18. This permits the oscillation of the tubular member 23 while preventing its longitudinal movement. The double type of blade is shown at 22 in Figures 1 and 2, requires means for properly positioning and holding it within the tubular member 23. This is accomplished in one manner by use of a blade holder 25 cut away to substantially half its diameter throughout the major portion of its length with lugs 26 remaining properly positioned to engage the openings of the blade and with an undercut 27 into which the end of the blade is first inserted and then closed downwardly over and upon the lugs 26. To maintain the blade holder 25 in the tubular member 23 to permit its ready withdrawal and insertion and yet maintain it in position for operation, a lug 28 is provided positioned to engage either one of the perforations 29 in the tubular member. The end cap of the casing 17 is provided with slots 30 which combine and extend diametrically on the opposite sides of the tubular member 23 and are of such proportion as to permit the insertion of the blade 22 and the blade holder 25 within the tubular member 23. After such insertion to the position shown at Figure 1 it is obvious that it may be oscillated so that either side of either edge may be brought into stropping relation with the rollers 15, the edges thus in contact as shown at Figure 2, will be subjected to the operating action of such rollers.

In view of the oscillation of the blade it is obvious that the rolls must be rotated in the same direction for operating upon opposite bevels of the blade to prevent cutting the surfaces of the rolls. To provide for such rotation a sleeve 31 is mounted within the core 16 for a limited sliding movement. The sliding movement is provided by producing a slot 32 in the sleeve 31 (see Figure 12) and a portion of the journal or core 16 forming a key 33 is struck inwardly within the slot 32. This insures the rotation of the sleeve 31 and core 16 together, but permits a limited sliding movement of the sleeve 31 relative to the core 16. The sleeve 31 extends outwardly through the end of the casing to form an extended bearing 20 and is capable of movement from the position shown at Figure 1 to the position shown at Figure 3.

Within each of the sleeves 31 a spiral 34 is slidably mounted, preferably, though not necessarily, constructed by twisting a square rod, as indicated especially at Figure 6. Rotary movement is imparted to the sleeve 31 from the spiral by striking down as indicated at 35 a portion of the sleeve 31 into engagement with the spiral. It is obvious now that when the spirals are reciprocated into and out of the casing, the stropping rolls will be rotated simultaneously in the same direction, first in one direction and then reversely in the other direction. For the purpose of imparting this simultaneous reciprocation to the worms 34 a handle 36 is provided which may be grasped by the hand of the operator. This handle is preferably formed with an eye 37 adapted for engagement with a hook 38 secured in a wall or other object 39 whereby the casing may be grasped by one hand and the spiral member being held against reciprocation by the hook, the stropping rolls are properly rotated by relative movement of the casing and spirals.

To impart the necessary oscillatory move-

ment to the blade, the tubular member 23 is extended beyond partition 18 is provided with a spiral 40. Embracing the spiral 40 is a bridge piece having an opening 42 (see Figure 8) properly shaped and proportioned to embrace the spiral so that movement of the bridge piece longitudinally upon the spiral will impart oscillatory movement thereto when such movement is intermittently and alternately in opposite directions. To provide for such oscillation of the bridge piece 41 the bridge piece is provided at opposite ends with segmental cut-outs 43 embracing spools 44 carried rigidly upon the sleeves 31.

Upon movement of the spiral driver, comprising the blade 36 and the two spirals 34, into the casing 20, the spirals 34 engaging the struck-in lugs 35 of the sleeves 31 tend to turn the sleeves and the stropping rolls which are mounted on the sleeves. However, the inertia or resistance of the rolls against rotation is sufficient to cause the sleeves 31 to move bodily endwise with the inward movement of the spiral driver. This endwise movement of the sleeves 31 within the stropping rolls is made possible by the slots 32 and the keys 33 as shown in Fig. 12. The endwise movement of the sleeves 31 carries with them the bridge piece—the grooved spools 44 rotating freely in the cut-out portion 43 of the bridge piece while holding the latter from rotation. As this bridge piece is thus moved from the position shown in full lines to dotted lines (Fig. 1), the opening 42 therein engages the spiral on the work holding support whereupon the tube 23 with the blade holder and blade therein is shifted so that the blade is brought into firm contact with the stropping rolls or roll. This shifting of the blade holder is due to the fact that the resistance to the turning of the blade holder is less than that of the stropping rolls. Contact of the blade with the stropping roll forms an abutment which prevents further movement of the spiral 40 and the bridge piece which consequently prevents further endwise movement of the sleeves 31. And, since the sleeves 31 are now not free to move axially, the continued inward movement of the spirals causes their rotation. Upon reaching the inward movement of the stroke of the spiral driver, its direction is reversed and the sleeves are again moved bodily with the driver by reason of the resistance to rotation of the rolls as before described, whereupon the blade is again shifted into contact with the stropping rolls providing increased resistance to cause the rotation of the stropping rolls, by the spiral driver.

The type of stropper for single edged type of blade is substantially identical with the hereinbefore described device for stropping the double edged blade except that only a single roller 15′ is employed and the yoke 41′ does not extend across to embrace spools 44 upon two sleeves, but only a single sleeve 44′. The blade holder 45 for this type of blade is preferably a tube of larger dimensions than the holder for the double type of blade and is slit only upon one side so that the blade 22′ as indicated at Figure 11, will be inserted in said slit with the back bearing against the opposite side. The angle of oscillation of this type of holder is greater than the angle of oscillation of the holder 23 as it is necessary that the blade 22′ be swung about a sufficiently large arc to engage the same roller upon different radii. The movement however is fully disclosed by Figures 10 and 11 so that further explanation will not be necessary. In either type withdrawal of the spirals 34 and 34′ is prevented by providing any means at their extremities for engagement with the struck-in portion 35 or 35′ here indicated as a screw 46 inserted into the extremities of such spirals, it being understood however that any obstruction or mutilation of the parts may be substituted therefor.

It is believed that the operation of the device has been sufficiently and clearly explained in describing the parts and their several functions and the operation of the completed device will not add to the understanding of the case.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. A blade stropper comprising a support, a roll carried by said support, a blade holder support journaled for angular movement adjacent said roll and incapable of endwise movement, a reciprocable driver, means to translate the opposite reciprocating movements of the driver into opposite rotary movements of the roll including a sleeve constructed and arranged to reciprocate a limted distance with the driver, and means to translate opposite reciprocations of the sleeve into opposite angular movements of the blade holder support.

2. A blade stropper comprising a casing, a pair of spaced stropping rolls journaled in the casing against endwise movement, a blade holder support journaled between the rolls, a driver reciprocable into and out of the casing, means to translate the opposite reciprocations of the driver into rotary movement of the rolls, first in one direction and then in the other including a sleeve mounted within the casing adapted to reciprocate a limited distance with the driver, and means to translate opposite reciprocations of the driver into opposite oscillations of the blade holder support.

3. A blade stropper comprising a casing, hollow stropping rolls journaled therein and held from endwise movement, a driver

having parallel spirals reciprocable through one end of the casing and within the hollow rolls, means connecting the rolls and spirals whereby opposite reciprocations of the spirals are translated into reversed rotary movements of the rolls simultaneously in the same direction, a blade holder support mounted within the casing and between the rolls, and means actuated from the spirals for imparting oscillatory movements to the blade holder support in timed relation to the reversal of the rotary movements of the rolls.

4. A safety razor blade stropper comprising an enclosing casing, rotatable stropping means journaled therein and held against endwise movement, an angularly shiftable blade holder support journaled therein in spaced relation to said stropping means, a driver reciprocable into and out of said casing axially of said stropping means and blade holder support, and devices operatively connecting said driver with said stropping means and blade holder support whereby to position said blade holder support and to rotate said stropping means.

5. A safety razor blade stropper comprising an enclosing casing, rotatable stropping means and a blade holder support journaled therein for rotational movement only, a driver reciprocable into and out of said casing in a plane parallel with the plane of rotation of said stropping means, and devices operatively connected to said stropping means and blade holder support and shiftable by said driver in such plane for positioning said blade holder support and rotating said stropping means.

6. A device of the class described comprising an enclosing casing, a partition fixed therein, stropping rolls, and a blade holder support rotatably journaled in one end of the casing and in said partition, a driver reciprocating into and out of said casing, rotatable sleeves mounted in said rolls and in the other end of said casing for endwise movement, a driver having a telescopic driving connection with said sleeves, and means for shifting said blade holder support on endwise movement of said sleeve.

7. A safety razor blade stropper comprising an enclosing casing, hollow stropping rolls rotatably journaled in said casing and held from endwise movement, a driver having spirals reciprocable through said rolls, sleeves shiftably mounted in said casing and surrounding said spirals, a blade holder support, means operable by the reciprocation of said driver for shifting and rotating said sleeves means operable by the shifting of said sleeves to position said blade holder support, and driving connections between said sleeves and rolls for rotating said rolls upon the rotation of said sleeves.

8. In a safety razor blade stropper, the combination of an enclosing casing, rotatable tubes journaled therein and held against endwise movement, stropping rolls fixed to said tubes, a blade holder support likewise rotatably journaled therein against endwise movement and provided with a spiral, a spiral driver reciprocable into and out of said casing, and means operatively connecting said driver to said tubes for rotating said tubes, said means being operatively connected to the spiral on said blade holder support for shifting said blade.

9. A safety razor blade stropper comprising an enclosing casing, telescoping sleeves journaled in the opposite ends of said casing and interconnected for rotation together, a stropping roll fixedly mounted on the outer of said sleeves, a spiral driver reciprocating through said sleeves, a driving connection between said driver and inner sleeve whereby to rotate said sleeves and cause their telescopic movement, a blade support, and means for shifting said blade holder support by the telescopic movement of said sleeves.

10. A device of the class described comprising an enclosing casing, stropping rolls and a blade holder, journaled therein, a driver having spirals reciprocating in said casing, a spiral on said blade holder, means for driving said rolls from said spirals, and a bridge piece engaging the spiral on said blade holder and shiftable by said roll driving means.

11. A device of the class described comprising an enclosing casing, a partition fixed therein, stropping rolls and a blade holder having their opposite journals in said casing and partition respectively, a spiral portion on said blade holder, a driver having spirals reciprocating in said casing, means for driving said rolls from said spirals, and a bridge piece engaging the spiral on said blade holder and shiftable by said roll driving means.

12. A device of the class described comprising an enclosing casing, stropping rolls journaled in spaced relation therein, a blade holder support journaled between said rolls and held from endwise movement, said blade holder support having a spiral portion, a spiral driver reciprocating into and out of said casing, and connections between said driver, said rolls and spiral portion of said blade holder for rotating said rolls and positioning the blade holder support with respect thereto.

13. A device of the class described comprising an enclosing casing adapted to be held in the hand, a stropping roll rotatably journaled therein and held against endwise movement, an angularly shiftable blade holder support mounted therein, rigid, hand-held driving means reciprocable into and out of said casing, and devices connected to said

stropping roll and blade holder support and actuated by the reciprocation of said driving means for operating said stropping roll and for automatically positioning the blade holder support.

14. A device of the class described comprising a support, a stropping roll rotatably mounted thereon and held against endwise movement, a blade holder support mounted thereon, a manually operated driver reciprocable relatively to said support in a plane parallel with the axis of rotation of said roll, and devices actuated by the reciprocation of said driver and connected to said stropping roll and blade holder for actuating said roll and for automatically positioning the blade holder support.

15. A device of the class described comprising a support, a hollow stropping roll rotatably journaled thereon and held against endwise movement, an angularly shiftable blade holder support mounted thereon, a rigid driver reciprocable through the hollow of said roll, and devices connected to said stropping roll and blade holder support and actuated by the reciprocation of said driver for operating said stropping roll and for automatically positioning the blade holder support.

16. A device of the class described comprising a support, a hollow stropping roll rotatably journaled thereon, and held against endwise movement, an angularly shiftable blade holder support mounted thereon against endwise movement, a rigid driver reciprocable through said roll, and devices connected to said roll and blade holder support and actuated by the reciprocation of said driver for operating said stropping roll and for automatically positioning the blade holder support.

17. A device of the class described comprising an enclosing casing, stropping rolls, journals for said rolls carried by said casing and lying wholly within the end walls of said casing, a blade holder mounted in said casing, a rigid driving means reciprocating into and out of said casing, and means operable by the reciprocation of said driving means for rotating said rolls and positioning said blade holder.

18. A device of the class described comprising in combination, an enclosing casing, a hollow tube journaled for rotation therein with its end free from projection outside of said casing, a stropping roll mounted on said tube, a blade holder support mounted in said casing, a driver including a spiral member reciprocating into and out of said tube, and devices for rotating said roll operated by said spiral member, said devices including means cooperating with said blade holder support to position the same.

19. A device of the class described comprising an enclosing casing, hollow tubes journaled for rotation therein and held from substantial endwise movement, stropping rolls carried by said tubes, a blade holder support mounted in said casing, spiral driving members reciprocable through said tubes, and means for rotating said tubes and positioning said blade holder support on reciprocation of said spirals.

In witness whereof, I have hereunto set my hand at Washington, District of Columbia, this 5th day of August, A. D. nineteen hundred and nineteen.

GEORGE D. GALLAGHER.