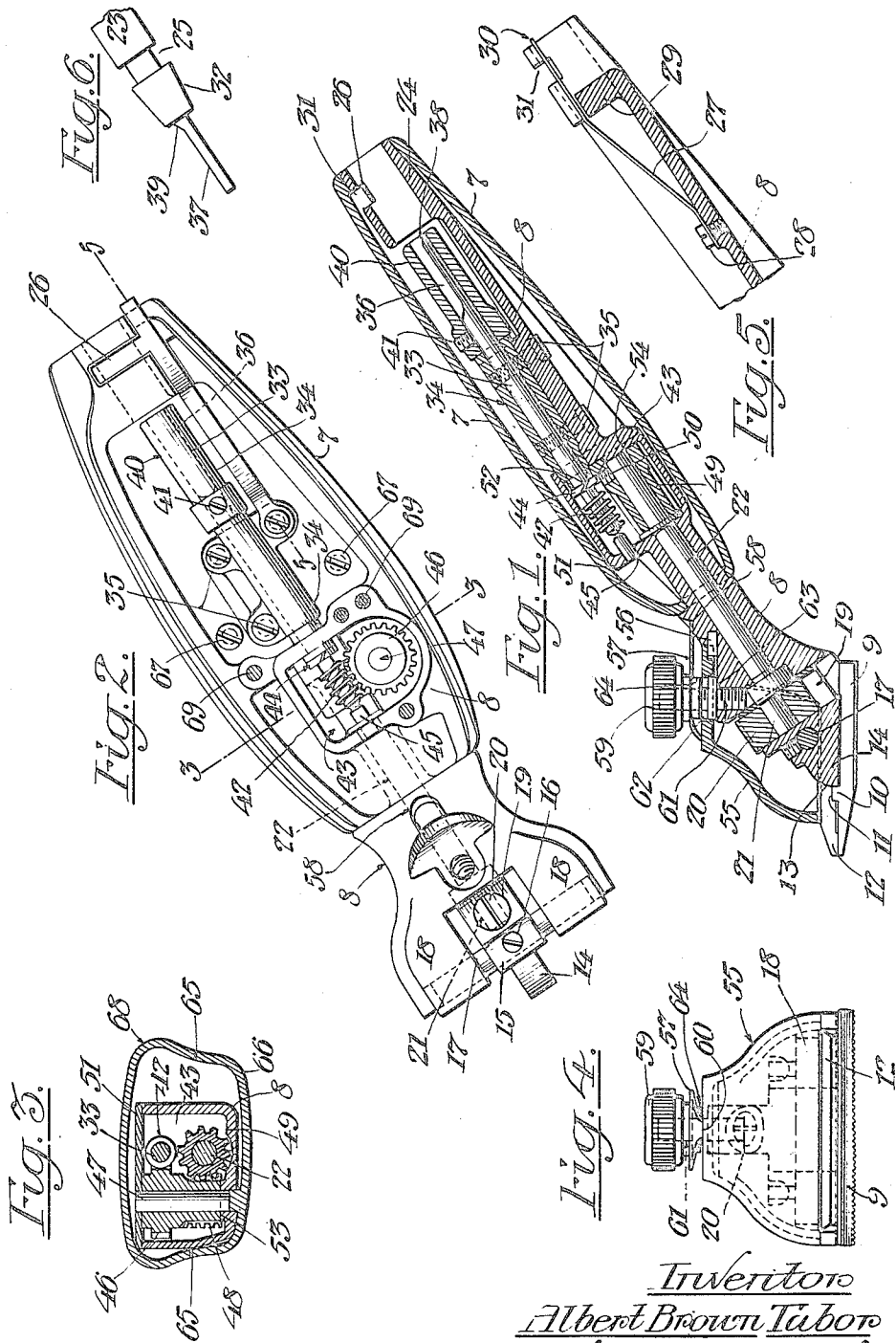


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A. B. TABOR.
HAIR CLIPPER.
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Inventor
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UNITED STATES PATENT OFFICE.

ALBERT BROWN TABOR, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE BROWN & SHARPE MANUFACTURING CO., OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

HAIR CLIPPER.

Application filed February 19, 1920. Serial No. 359,929.

To all whom it may concern:

Be it known that I, ALBERT BROWN TABOR, a citizen of the United States of America, residing at 244 Massachusetts Avenue, in the city of Providence, county of Providence, and State of Rhode Island, have invented certain new and useful Improvements in Hair Clippers, of which the following is a specification.

My invention relates to hair clippers, and particularly clippers of the power-driven type as distinguished from the hand-operated type, the object of my invention being to provide a power-driven clipper of improved construction. As will be readily recognized, however, certain features of the present construction may be embodied to advantage in a hand-operated clipper.

In the accompanying drawings—

Fig. 1 is a longitudinal section of a clipper in which my invention is embodied in one form;

Fig. 2 is a plan view thereof, portions of the casing and certain other parts being removed to disclose the mechanism;

Fig. 3 is a section on the line 3—3, Fig. 2;

Fig. 4 is a front elevation of the head of the clipper;

Fig. 5 is a partial section on the line 5—5, Fig. 2; and

Fig. 6 is an elevation of the coupling end of an associated flexible drive shaft.

As here shown, the driving mechanism is housed within a hand-grip casing 7, from one end of which projects the main frame 8 of the clipper. The bottom stationary blade plate 9 is secured in any suitable way to the forked end 18 of the frame 8 and is provided on its upper face with a transverse rib 10 which fits in a corresponding transverse groove 11 in the upper or movable blade 12. The latter is recessed in its outer face at 13 to receive the tongue 14 which projects into the recess from the cross head 15, and the latter is secured by the set screw 16 to the slide rod 17, which is guided in bearings drilled in the fork 18 of the frame 8. The cross head 15 is pierced at 19 at right angles to the axis of the rod 17 to receive the slide

block 20 engaged by the crank pin 21 of the drive shaft 22. Obviously, as the crank shaft 22 rotates, a transverse reciprocation is imparted to the cross head 15 through the slide block 20, and the movable blade 12 is thus shifted back and forth upon the stationary blade 10 to obtain the shearing action. The side pressure of the slide block 20 in its bearing 19 tends to keep their axes aligned and thus prevents any tendency to rotate the cross head 15 about the axis of the slide rod 17. This prevents any rocking of the tongue 14 around the axis 17, which, should it occur, might disturb the seating of the plate 12 on the plate 9 and thus affect the shearing action.

The drive of the crank shaft 22 is taken through suitable reducing gears from a flexible shaft 23 (Fig. 6), driven by an electric motor or the like. The detachable coupling of the flexible shaft is preferably made at the end of the handle 7 opposite the clipper head. As here shown the frame 8 of the clipper is provided at the end of the handle with a sleeve 24 adapted to receive the end of the flexible shaft casing 23. To detachably engage the shaft, its casing is provided with an annular groove 25, which in inserted position is engaged by an arm 26 carried by a spring 27. The latter is secured at one end by the screw 28 to the frame, while its other end, passing over the bridge 29, is exposed at its free end 30 for manual operation. The arm 26 of the spring lies in a notch 31 cut in the sleeve 24 and snaps back into the groove 25 in the flexible shaft 23 after having been displaced by the beveled end 32 of the latter. In order to release the shaft 23 it is merely necessary to lift the exposed end of the spring 30 to disengage the spring arm 26 from the groove 25, whereupon the shaft 23 may be freely withdrawn.

Within the handle, and in line with the sleeve 24, is a worm shaft 33 mounted in a bearing sleeve 34 attached to the frame by screws 35. The coupling end of the shaft projects beyond the end of the bearing sleeve and is cut away at 36 to receive the reciprocally cut end 37 of the flexible shaft. To

facilitate the engagement between the shafts, the worm shaft 33 may have its end beveled at 38 as indicated, in which case a corresponding bevel 39 is formed on the recessed end of the flexible shaft 23. When the coupling has been effected the recessed sections of the shafts 33 and 37 are complementary to each other, and the parts are held in this position by the engagement of the spring arm 26 in the groove 25. In order to insure a close engagement of the shaft ends, a coupling sleeve 40 is secured upon the worm shaft 33 by means of a set screw 41 and embraces the recessed portions of the shaft ends.

The worm 42, which is cut at the opposite end of the shaft 33, lies within a chamber or pot 43 cast integral with the frame 8 and serving to hold a lubricant in which the gears work. A shoulder 44 on the shaft 33 rests against the end of the bearing 34. The thrust of the shaft, however, is in the opposite direction and is taken by a thrust pin 45 driven in the side of the pot 43 and having a rounded end which bears against the rounded end of the worm shaft 23. A worm wheel 46 mounted on a pin 47 meshes with the worm 42. A spiral gear 48 on the hub of the worm wheel 46 meshes with a cooperating spiral gear 49 secured by set screw 50 to the crank shaft 22, which is thus driven at reduced speed from the worm shaft 33. The pot 43 is open on one face and is closed, after the assembly of parts, by a cover 51 into a hole in which the pin 47 of the worm wheel 46 enters. A finished surface at 53 affords a bearing for the worm wheel 46, and a similar finished surface 54 affords a suitable thrust bearing for the spiral gear 49 on the crank shaft 22. Lubricant may be conveyed from the gear chamber to the bearing sleeve 34 through a tangential slot 52 cut in the flange 44 on the worm shaft.

The pressure cap 55 which rests upon the reciprocating shear plate 12 and maintains the latter in engagement with the stationary plate 9, rocks upon a pin 56 driven into the frame 8. The pressure spring 57 rests at one end in a seat 58 in the neck of the frame 8, is engaged beneath the head of the regulating screw 59, and is constricted to a narrow finger 60, where it bears upon the cap 55. The screw stud 61, upon which the nut 59 works, is carried by the frame and projects upward through the hole 62 in the pressure cap. The stop washer 63 is swaged on the stem of the screw 61 and is engaged by the hub washer 64 of the screw cap 59, and thus serves to limit the downward movement of the screw cap and to prevent injurious pressure upon the spring 57. The action of the spring in the present construction is not that of a spring washer, but is that of a spring clamp, which

is applied at one spot at the front of the pressure cap and insures that the pressure on the plate 12 is constant for a certain tension on the spring, and furthermore it gives a better leverage for the spring pressure.

The construction of the casing handle 7 may be variously modified. I prefer, however, that it should be of non-metallic substance, like fiber or hard rubber, which will not conduct heat, or present a too slippery surface for a satisfactory hand-hold. It is preferably made in two parts, with the parting at 65, the lower section 66 being secured to the frame by the two screws 67, while the upper section 68 is secured to the frame by the screws 69, and may be readily removed to afford access to the gearing for repairs, adjustment, or lubrication. The frame is preferably made of light material and of ribbed section to give the required rigidity with the least possible weight of metal.

Various modifications in the detail of construction will readily occur to those skilled in the art, without departing from what I claim as my invention.

I claim—

1. In a clipper, a frame having at one end an apertured guide sleeve, a bearing rigid with the frame and aligned with said sleeve, a transmission shaft passing through said bearing and recessed at the sleeve end thereof to afford a coupling engagement with a drive shaft passed through said guide sleeve, and a spring latch passing through the aperture in the guide sleeve to engage and detachably retain the drive shaft in coupled position.

2. In a clipper, a frame having at one end a guide sleeve provided with a cross slot, and a spring carried by the frame and having an arm projecting through the cross slot in the guide sleeve to engage and detachably retain a drive shaft inserted into said sleeve.

3. In a clipper, a frame, a chamber rigid therewith, a shaft projecting into said chamber, a shoulder on said shaft and positioned within said chamber, a shaft bearing exterior to the chamber, and a slot through said shoulder to convey lubricant from the chamber to said bearing.

4. In a clipper, a frame, a chamber rigid therewith, a shaft projecting into said chamber and having a worm thereon within the chamber, and a bearing pin secured in the wall of said chamber in line with the worm shaft and taking the thrust thereof together with a crank shaft extending into said chamber from the opposite direction on a parallel axis and an operative connection between said worm shaft and crank shaft, said connection being arranged within said chamber, substantially as described.

5. In a clipper, a cutter head having a

reciprocating cutter plate, a member bearing thereon, a spring lever resting at one end against the clipper body and at its other end against said member, a screw stud secured to the clipper body and passing through the spring lever, and a nut screwing thereon and bearing against said spring to regulate its pressure against said member, together with means to limit the pressure of said nut on said spring lever. 10

In testimony whereof I have signed my name to this specification.

ALBERT BROWN TABOR.