Feb. 20, 1940. F. FISHBEIN ET AL 2,191,073

ROTATIVELY OSCILLATABLE HAIR CLIPPER

Filed Jan. 15, 1938

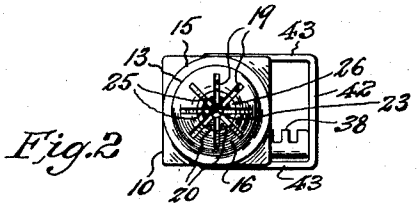


Fig. 2

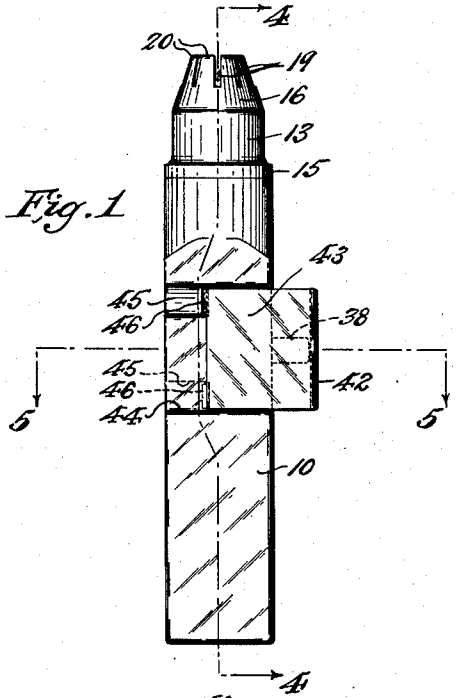


Fig. 1

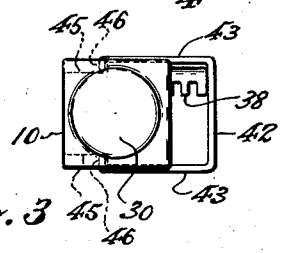


Fig. 3

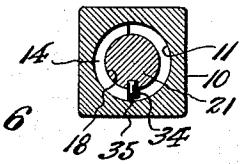


Fig. 6

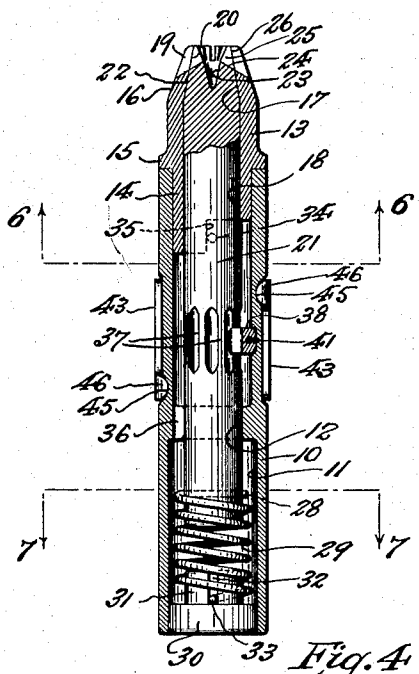


Fig. 4

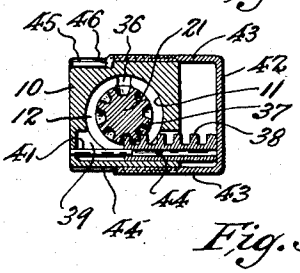


Fig. 5

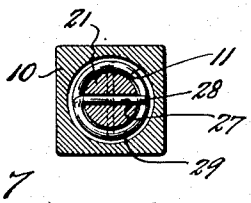


Fig. 7

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ROTATIVELY OSCILLATABLE HAIR CLIPPER

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5 Claims. (Cl. 30—207)

This invention relates, generally, to a novel construction of rotatively oscillatable cutting mechanism for clipping hair; and the invention has reference, more particularly, to a novel clipper device having circular cutting mechanism of sufficiently small diameter to permit insertion and operation thereof within small cavities, such e. g. as nostril or ear cavities from which it is desired to cut away and remove hair growth.

This invention has for an object to provide a novel clipper device for the purposes mentioned, comprising an outer hollow tapered or conical cutter means and an inner tapered or conical cutter means telescopically fitted together and arranged for rotative oscillatory relative movement about a common longitudinal axis, said cutter means having cooperative circumferentially spaced shear blades; a novel arrangement of spring means being also provided for exerting, by spring compression, axial thrust upon said cutting means adapted to maintain the shear blades thereof in constant close contact for both efficient cutting and for self-sharpening effects, while, at the same time, also exerting upon said cutter means a torsional tension in cooperation with means for manually inducing operative rotative oscillatory movement of the inner cutter means relative to the outer cutter means.

Another object of the invention is to provide a simple, non-binding and easily manipulated means for producing relative rotary movements of said inner and outer cutter means.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of this invention is shown in the accompanying drawing, in which:

Fig. 1 is a side elevation of the novel clipper device made according to this invention; Fig. 2 is a top end elevation of the same; Fig. 3 is a bottom end elevation of the same; and Fig. 4 is a longitudinal sectional view of the same, taken on line 4—4 in Fig. 1.

Fig. 5 is a transverse section of the novel clipper device, taken on line 5—5 in Fig. 1; Fig. 6 is another transverse section, taken on line 6—6 in Fig. 4; and Fig. 7 is also a transverse section, taken on line 7—7 in Fig. 4.

Similar characters of reference are employed in the hereinabove described views, to indicate corresponding parts.

Referring to the drawing, the reference character 10 indicates a casing member. Preferably this casing member, for a portion of its length at least, is of rectangular external cross-sectional shape, but is provided with an axial bore 11 which is preferably of circular cross-section. Intermediate its ends, said casing member is provided with an internal annular shoulder or rib adapted to provide an internal lower bearing 12 for purposes hereinafter described.

The outer cutter means of the device comprises a cutter head 13 which is provided at its lower end with a shank portion 14 for insertion into the upper end of the bore 11 of said casing member 10, and so as to be secured in fixed relation to the latter either frictionally or by any suitable mechanical fastening means. Preferably said outer cutter head is provided with an external annular flange or bead 15 to abut the upper end of said casing member 10 when affixed thereto. Said outer cutter head 13 is provided with an external tapered or conical free end portion 16, and an internal tapered or conical seat portion 17 substantially coextensive therewith. Extending downwardly from said internal tapered or conical seat portion 17 and axially through outer cutter head 13 is a cylindrical bore which provides an upper bearing 18 for purposes hereinafter described. Said conical free end portion 16 of said outer cutter head 13 is provided with a plurality of radially extending circumferentially spaced slots 19 which extend downwardly thereinto from its upper end for a portion of its length, thereby dividing the same into a plurality of circumferentially spaced outer shear blades 20.

The inner cutter means of the device comprises a cylindrical body member 21 axially disposed within the casing member 10 so as to be rotatably journaled, at one point, by the lower bearing 12 formed in connection with said casing member, and, at another point, by the upper bearing 18 provided by the bore of said outer cutter head 13. At its upper end, said body member 21 is provided with a conical inner cutter head 22 shaped to engagingly fit and conform to the internal tapered or conical seat portion 17 of said outer cutter head 13. Formed in the outer end of said conical inner cutter head 22 is a cavity 23 thus forming an annular cutter portion 24. This cutter portion 24 is provided with a plurality of radially extending circumferentially spaced slots 25 which extend downwardly thereinto from its upper end for a portion of its length, thereby dividing the same into a plurality of circumferentially spaced inner shear blades 26 corresponding in number to the number

of outer shear blades 20 with which the outer cutter head 13 is provided. The bottoms of the slots 19 of the outer cutter head 13 and the bottom of the slots 25 of the inner cutter head 22 are located intermediate the free ends and the bases of the conical formations constituting heads, and preferably said slot bottoms incline inwardly and upwardly, as shown in Fig. 4. This is of importance, for it is found that should these slots intersect the plane of the bases of said conical formations, there is a tendency for the hairs to lie so deeply in the heads that short cutting thereof is not attained, but also some tendency to unpleasant pull upon the hairs is likely during the cutting operation.

In assembling the inner cutter means with the casing member 10 and the outer cutter head 13, the body member 21 is inserted upwardly through the lower open end of the casing member bore 11, thus rotatably mounting said body member 21 in journaled relation to the bearings 12 and 18. The lower end of said body member 21 is provided with a downwardly open transverse seating slot 27 to receive the upper terminal portion 28 of a spiral spring 29. Adapted for insertion in the lower open end of said casing member 10 is a plug 30 having an inwardly and upwardly projecting boss 31. This boss 31 is provided with an upwardly open transverse seating slot 32 to receive the lower terminal portion 33 of said spiral spring 29. Suitably affixed to said body member 21 to project laterally from the side thereof in proper location is a stop projection 34. The lower inner extremity of the shank portion 14 of said outer cutter head 13 is cut away to provide a stop shoulder 35 normally engageable by said stop projection 34. The lower bearing 12 is provided with a vertical channel or passageway 36 to permit the stop projection 34 to pass the same, when the body member 21 is inserted into operative assembled relation to the casing member 10 and outer cutter head 13. When the spiral spring 29 is engaged between the body member 21 and said plug 30, the latter is turned about its vertical axis in an anti-clockwise direction to place the spring under a torsional tension, whereupon said plug 30 is driven into and frictionally affixed in the lower end of the casing member bore 11, thereby also placing the spring under axial compression. The torsional tension of the spiral spring 29 will rotate the body member 21 in an anti-clockwise direction until its stop projection 34 abuts the stop shoulder 35 of the outer cutter head shank portion 14, in which position the shear blades and slots of the inner cutter head 22 will register in alignment with the shear blades and slots of the outer cutter head, as shown in Fig. 1 more especially. At the same time the axial compression of the spiral spring 29 will exert an upward axial thrust upon the body member 21, whereby the inner cutter head 22 will be maintained in close fitting engagement with the internal or conical seat portion 17 of the outer cutter head 13, thus not only maintaining the shear blades in operative contact, but also so as to take up any wear thereof, and so that the same, in operation, cooperate with self-sharpening effect.

The means for imparting relative rotary movement to the cutter heads, comprises a rack and pinion mechanism provided by gear teeth 37, with which the body member 21 of the inner cutter means is provided at a point intermediate the lower and upper bearings 12 and 18, and by a transversely movable rack member 38 which operatively engages said gear teeth. The rack member 38 is slidably supported in a way 39 provided in the casing member 10, and opening from a side thereof to permit an end of said rack member to project exteriorly therefrom. If desired, to further support the rack member 38 for proper longitudinal movement, the same may be provided with a longitudinal opening or passage 40 to slidingly engage a guide-rod or pin 41 suitably affixed to the opposite wall of said casing member 10. The means for actuating said rack-member 38 comprises a slide-yoke 42 the arms 43 of which externally straddle opposite sides of said casing member 10, the same being slidably supported in guideways 44 with which the said sides of the casing member are provided. Also formed in said casing member sides, adjacent to the upper margin of the guideway 44 of one side and adjacent to the lower margin of the guideway 44 of the other side, are guide channels 45 in which ride stop-ears 46. Said stop ears 46, by abutment against the inner ends of said guide channels 45, serve to limit the outward movement of said slide-yoke 42. The torsional tension of the spiral spring 29, as exerted upon the body member 21 of the inner cutter means, to rotate the latter anti-clockwise, is transmitted through gear teeth 37 to said rack member 38 to normally project the same to outwardly moved position, and thereby likewise moves said slide-yoke 42 to correspondingly outwardly moved position.

In the use of the clipper device, constructed as above described, the operator applies the same to the selected cavity from which hair is desired to be removed, so that hairs will enter the slots of the cutter heads and will thus lie between normally aligned shear blades. The operator thereupon presses inwardly upon the slide yoke 42, thereby sliding inwardly the rack member 38, so that the movement thereof induces a rotary movement of said body member 21 and its inner cutter head 22 in a clockwise direction. This operation causes a rotation of the shear blades 26 of the inner cutter head relative to the shear blades 20 of the outer cutter head, so that the same move shearingly one over the other, thus clipping or servering hairs deposited through the slots therebetween. By releasing the slide-yoke 42 from inwardly moving pressure, the torsional tension of the spiral spring 29 will reverse the rotation of the body member 21 and inner cutter head 22, so that all parts are returned to normal initial positions. These operations may be repeated as necessary, until severing of the hairs desired to be removed is entirely accomplished.

Owing to the support of the body member 21 of the inner cutting means by the spaced bearings 12 and 18, and the application of rotating force through the operation of the rack and pinion means at a point of said body member intermediate said bearing points, a very smooth and easy operation of the device is assured, with a minimum of frictional resistance, and with no tendency of canting of the body member 21 and consequent impeding of its operative movement or relative displacement of the inner and outer cutter heads from their mutually engaged operative relation.

The rack and pinion actuating means also assures a considerable amplitude of relative rotary movement between the outer and inner cutter heads, so that given teeth of the latter will traversingly pass a multiple of teeth of the former, thus assuring every opportunity for hairs

to be engaged and cut, and consequently affording a very efficient action of the device for its intended purposes.

The disposition of the guide channels 45 as described also aids in maintaining alignment of the actuating slide-yoke 42 throughout its movements, without tendency to twist or cant out of position with consequent likelihood of impeding smooth, easy and efficient action thereof.

It will be understood that many apparently widely different embodiments of this invention could be made without departing from the scope thereof; it is therefore intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. A device of the kind described comprising, a casing member, a hollow outer conical cutter means affixed to the upper end of said casing member and having an internal conical bearing surface at the inner faces of the cutter elements thereof, an inner cutter means cooperative with said outer cutter means and having an external conical bearing surface to engage the internal bearing surface of said outer cutter means, spring means to exert both torsional and axial thrust effects upon said inner cutter means, whereby the axial thrust maintains the cooperating conical bearing surfaces of the inner and outer cutter means in contact with self sharpening effect upon their cutter elements, means to anchor one end of said spring means in connection with said casing member, means to couple the other end of said spring means to said inner cutter means, means to determine a normal rotatively stopped relation of said inner cutter means relative to said outer cutter means to align their cutter elements and intervening spaces, and means to produce relative rotary cutting movements of said cutter means.

2. A device of the kind described comprising, a casing member, a hollow outer conical cutter means affixed to the upper end of said casing member and having an internal conical bearing surface at the inner faces of the cutter elements thereof, an inner cutter means cooperative with said outer cutter means and having an external conical bearing surface to engage the internal bearing surface of said outer cutter means, spring means to exert both torsional and axial thrust effects upon said inner cutter means, whereby the axial thrust maintains the cooperating conical bearing surfaces of the inner and outer cutter means in contact with self sharpening effect upon their cutter elements, means to anchor one end of said spring means in connection with said casing member, means to couple the other end of said spring means to said inner cutter means, means to determine a normal rotatively stopped relation of said inner cutter means relative to said outer cutter means to align their cutter elements and intervening spaces, and means to produce relative rotary cutting movements of said cutter means, said latter means comprising a rack and pinion means for rotating said inner cutter means, and means carried by said casing member and operative upon the exterior end of the rack element of said rack and pinion means for actuating the same.

3. A device of the kind described comprising, a casing member, a hollow outer conical cutter means affixed to the upper end of said casing member and having an internal conical bearing surface at the inner faces of the cutter elements thereof, an inner cutter means cooperative with said outer cutter means and having an external conical surface to engage the internal bearing surface of said outer cutter means, said inner cutter means having a cylindrical body portion, spring means to exert both torsional and axial thrust effects upon said inner cutter means, whereby the axial thrust maintains the cooperating conical bearing surfaces of the inner and outer cutter means in contact with self sharpening effect upon their cutter elements, means to anchor one end of said spring means in connection with said casing member, means to couple the other end of said spring means to said inner cutter means, means to determine a normal rotatively stopped relation of said inner cutter means relative to said outer cutter means to align their cutter elements and intervening spaces, axially spaced bearing portions to journal the cylindrical body of said inner cutter means, and means to produce relative rotary cutting movements of said cutter means, said latter means comprising a pinion on the inner cutter means located between said spaced bearing portions, a rack movable transversely through said casing member and meshing with said pinion, a slide yoke means exteriorly embracing said casing member in transverse relation thereto and operative upon the exterior end of said rack for actuating the same, and said casing member and slide yoke means having cooperative stop means for determining the normal outwardly projected initial position of said slide yoke means.

4. A device of the kind described comprising, a casing member, a hollow outer conical cutter head affixed to the upper end of said casing, said outer cutter head having an internal conical seat portion, said outer cutter head having circumferentially spaced shear blades formed at and around its free end portion, a conical inner cutter head to engagingly fit and conform to the internal conical seat portion of said outer cutter head, said inner cutter head having circumferentially spaced shear blades formed at and around its free end portion, said inner cutter head having an axially extending cylindrical body member, spaced bearing means connected with said outer cutter head and said casing member to support said body member, spring means to exert both torsional and axial thrust effects upon said body member and inner cutter head, whereby the axial thrust maintains the inner conical cutter head engaged with the internal conical seat of the outer head with self-sharpening effect upon their shear blades, means to anchor one end of said spring means in connection with said casing member, means to couple the other end of said spring means to said inner cutter head body member, means to determine a normal rotatively stopped relation of said inner cutter head relative to said outer cutter head wherein the cutter blades of said heads are initially disposed in radially aligned relation, and means to produce rotary movement of said inner cutter head and its shear blades relative to said outer cutter head and its shear blades.

5. A device of the kind described comprising, a casing member, a hollow outer conical cutter head affixed to the upper end of said casing, said outer cutter head having an internal conical seat portion, said outer cutter head having circumferentially spaced shear blades formed at and around its free end portion, a conical inner cutter head to engagingly fit and conform to the internal conical seat portion of said outer cutter

head, said inner cutter head having circumferentially spaced shear blades formed at and around its free end portion, said inner cutter head having an axially extending cylindrical body member, spaced bearing means connected with said outer cutter head and said casing member to rotatively journal said body member, spring means to exert both torsional and axial thrust effects upon said body member and inner cutter head, whereby the axial thrust maintains the inner conical cutter head engaged with the internal conical seat of the outer head with self sharpening effect upon their shear blades, means to anchor one end of said spring means in connection with said casing member, means to couple the other end of said spring means to said inner cutter head body member, means to determine a normal rotatively stopped relation of said inner cutter head relative to said outer cutter head wherein the cutter blades of said heads are initially disposed in radially aligned relation, and means to produce rotary movement of said inner cutter head and its shear blades relative to said outer cutter head and its shear blades, said latter means comprising gear means on said inner cutter head body member at a point intermediate said journaling bearings thereof, a rack means transversely slidable relative to said casing member and adapted to engage said gear means, a slide yoke means exteriorly embracing said casing member in transverse relation thereto and operative upon the exterior end of said rack means for actuating the same, and said casing member and slide yoke means having cooperative stop means for determining the normal outwardly projected initial position of said slide yoke means.

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