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T. I. MOSELEY
TWEEZERS

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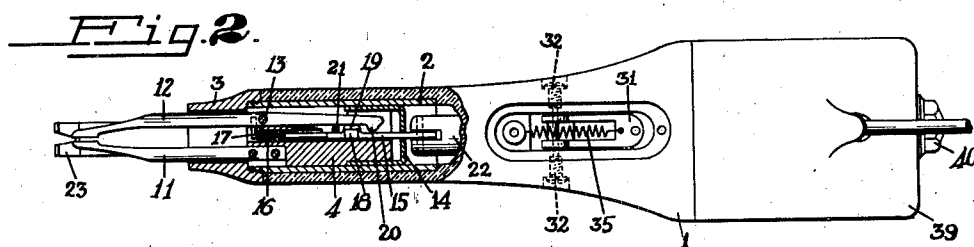
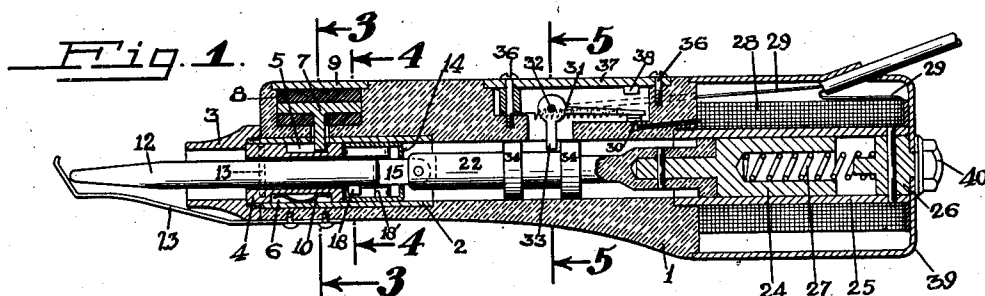


Fig. 3.

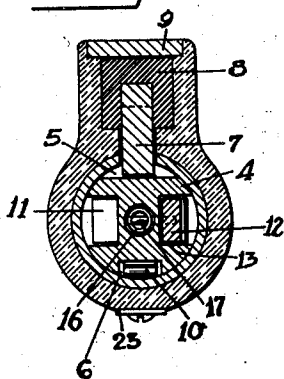


Fig. 4.

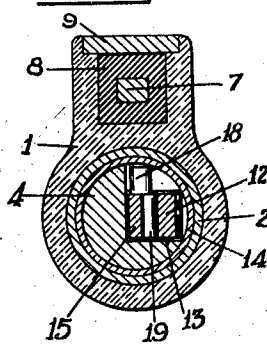
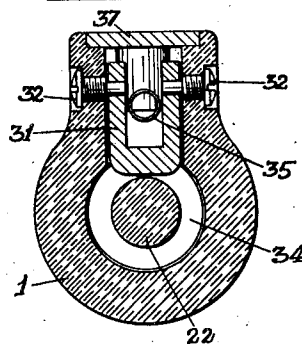


Fig. 5.



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TWEEZERS

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14 Claims. (Cl. 128—355)

This invention relates to improvements in electrically operated tweezers.

An object of my invention is to provide an automatic hair pulling tweezer which is particularly adapted for use in removing superfluous hairs from the eyebrows.

Another object of my invention is to provide an electrically operated tweezer having a pair of gripping jaws capable of being projected and at the same time automatically separated at their gripping ends; the device also including mechanism for temporarily retaining the jaws in a projected position while they are being closed upon a hair which is to be removed, and electrically operated retracting mechanism for automatically withdrawing the jaws with the firmly grasped hair therebetween.

A further object of my invention is to provide an automatic tweezer of novel design and construction which is capable of grasping and pulling hairs from the eyebrows or elsewhere with such rapidity that the subject experiences no appreciable pain.

Other objects more or less apparent will present themselves or will be specifically pointed out in the description of my invention which is to follow.

In the accompanying drawing:

Fig. 1 is a longitudinal central section of tweezers constructed in accordance with my invention;

Fig. 2 is a top plan view of the tweezers partly in section, showing the cover or name plate removed;

Fig. 3 is an enlarged section taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged section taken on the line 4—4 of Fig. 1; and

Fig. 5 is an enlarged section taken on the line 5—5 of Fig. 1.

The present invention, although intended primarily as a device to be employed in removing superfluous hairs, is capable of being adapted for use in mechanical work also.

Referring to the drawing, the numeral 1 designates the main body portion of a casing made preferably from an insulating material such as moulded phenolic condensate product. Imbedded in the front end of the casing is a sleeve 2 which has a ferrule 3 detachably secured thereto. Mounted for reciprocating motion inside the sleeve 2 is a block 4 which is provided with oppositely disposed grooves 5 and 6 on its top and bottom sides, respectively.

Extending into the groove 5 through oversized

openings provided in the casing 1 and sleeve 2, is a stop or shock absorbing member 7 against which the rear and front end walls of the groove 5 contact when the block 4 moves with reciprocating motion. The member 7 is preferably T-shaped, and is suitably imbedded in a cushion 8 of resilient material located in an opening provided in the upper side of the casing 1. The opening within which the cushion 8 is located is closed at its top side by a suitable cover 9. The front end of the block 4 is adapted to contact with a shoulder on the ferrule 3, which provides stop means for confining the forward movement of the said block within certain limits. A leaf spring 10 located in the groove 6, engaging with both the block 4 and the sleeve 2, tends to provide means for maintaining the proper frictional relationship between the block and the sleeve.

Extending through the ferrule 3 are jaws 11 and 12 of the tweezers. The rear part or leg of the jaw 11 is rigidly secured, as by screws, to the block 4, while the rear part or leg of the jaw 12 at points intermediate its ends is pivotally secured, as at 13 to the said block, within a suitable longitudinal slot provided in the latter. Movably extending through a centrally disposed end cap 14 provided on the rear end of the block 4 is a rod 15 which is suitably connected to a reciprocating plunger 22 mounted in the casing 1. The end cap 14 is intended primarily as a means for confining a suitable lubricating and sound deadening medium within the longitudinal slot of the block 4. The forward end of the rod 15 engages with the rear end of a spiral spring 16 located in the block 4. The forward end of the said spring is normally in contact with a projection 17 which is secured to the leg of the jaw 12 at a point forwardly of the pivot 13. The spring 16 is intended to take up the shock of the rod 15 as it is moved forwardly. The forward pressure exerted by the rod 15 upon the spring 16 is transferred to the projection 17, thereby causing the jaw 12 to move about its pivot 13 so as to bring about a separation of its forward gripping end from the adjacent end of jaw 11. The rod 15 is provided with a projection 18 which is located directly forward of a shoulder 18' on the rear end of the block 4. When the rod 15 is moved rearwardly, the projection 18 engages with the said shoulder 18', thereupon causing the block and the tweezers to be moved in a rearward direction.

So as to provide means for bringing the jaw 12 into gripping engagement with the jaw 11 prior to the rearward movement of the said jaws, a protuberance or projection 19 is provided on a

side of the rod 15. The protuberance 19 is positioned so as to engage with a protuberance 20 located at the inner side of the rear end of the leg of jaw 12, when the rod 15 is moved in a rearward direction. The relative positions of the protuberance 20 and the rear shoulder 18' of the block 4 is such that the said shoulder is engaged by the projection 18 after the protuberance 19 has firmly engaged with the protuberance 20 on the said leg of jaw 12. In this way, the engagement of the protuberance 19 with the protuberance 20 causes the jaw 12 to be brought into a firm gripping position with respect to the jaw 11, prior to the time the block 4 and the said jaws are moved rearwardly. So as to provide means for moving the block 4 and the tweezers in a forward direction, a pin or screw 21 is secured to the said block, across its longitudinal slot, and directly adjacent and in front of the protuberance 19 on the rod 15. Thus as the rod 15 is moved forwardly, the protuberance 19 engages with the screw 21 and causes the block and tweezers to be carried in a forward direction until such movement is arrested by the shoulder on the ferrule 3 being engaged by the said block. It is therefore apparent when the plunger 22 is moved forwardly that the jaws 11 and 12 of the tweezers are also moved in the same direction and at the same time separated one from the other. It is also apparent when the plunger is moved rearwardly, that the jaw 12 is brought into firm gripping engagement with the jaw 11, and that thereafter the two jaws while maintained in their firm gripping relationship with one another are moved in unison in a rearward direction.

Secured as by screws to the casing 1 is a combined hair guide and skin protector 23, the free forked end of which is normally positioned just in front of the jaws 11 and 12 when they are in an extreme forward position.

An armature 24, mounted for reciprocating motion in a sleeve 25 which is attached to the rear end of the casing, is suitably secured to the plunger 22 as by a pin. Interposed between the armature 24 and a stop member 26 which is pinned to the rear end of the sleeve 25, is a spiral spring 27. The spiral spring 27 causes the return of the jaws 11 and 12 to their extreme forward positions after they have been pulled rearwardly against the said spring by the movement in the same direction of the armature. A solenoid 28, supplied with electrical current from a suitable source through wires 29 is adapted to be intermittently energized by the operation of a suitable switch, thereby causing the armature to be moved rearwardly each time the circuit to the solenoid is closed. The solenoid is electrically connected at one end to a stationary contact point 30, and a contact control lever 31 pivotally mounted on toggle screws 32 is adapted to be moved into and out of engagement with said contact point. The contact control lever 31 is provided with a depending arm 33 which extends between two spaced projections 34 on the plunger 22. As the plunger 22 is actuated back and forth, its two spaced projections 34 alternately engage with the arm 33 of the contact control lever 31, thereby causing the latter to be moved into and out of engagement with the contact point 30. A toggle spring 35 attached to the contact control lever 31 and to one of the screws 36, gives the said lever a definite flip in an upward or downward direction just after the arm 33 is engaged by the projections of the plunger. The contact control lever 31 is connected by a wire 29 to the source of electrical

current, so when the said lever is brought into engagement with the contact point 30 the circuit to the solenoid is completed. Upon the completion of the circuit to the solenoid the latter is energized, thereby causing the armature 24, the plunger 22, the block 4 and the tweezers to be pulled rearwardly. The rearward movement of the plunger brings the foremost of the two projections 34 into engagement with the arm 33 of the contact control lever, thereby causing the disengagement of the latter from the contact point 30. As soon as the circuit to the solenoid is broken, the then compressed spring 27 forces the armature 24, the plunger 22, the block 4 and the tweezers in a forward direction. When the plunger is moved sufficiently in a forward direction the rearmost of the two projections 34 engages with the arm 33 of the control lever 31, thereby causing the latter to again contact with the point 30 to complete the circuit to the solenoid 28. In this manner the tweezers are automatically moved back and forth with reciprocating motion. The opening in the casing within which the contact control lever 31 is mounted is normally closed by a cover or name plate 37. The name plate is secured to the casing by the screws 36, and an insulated contact point 38 on the bottom of the said plate serves as buffer means for the contact control lever 31 in its upward movement.

Mounted at the end of the casing 1 and extending in spaced relation around the solenoid 28, is an end cap 39 which is secured to the armature's stop member 26 by a nut 40. The end cap is provided with a suitable opening through which the wires 29 extend.

It is apparent to those skilled in the art that my invention is susceptible of numerous modifications and changes in regard to form, shape and minor details of construction. It therefore is to be understood that the appended claims are to determine the scope of my invention rather than the exact disclosures made herein.

Having described my invention, what I claim is:

1. A tweezers comprising a pair of gripping jaws, one of said jaws being mounted at a point intermediate its ends for pivotal movement and the other of said jaws being rigidly mounted, means for applying an outward pressure to the pivotally mounted jaw at a point adjacent an end thereof while the fixed jaw is held stationary, whereby the opposite end of said pivoted jaw may be moved into gripping position with respect to the fixed jaw, and means for moving the two jaws bodily rearwardly while they are in gripping position.

2. A tweezers comprising a pair of gripping jaws, reciprocating means mounting said jaws, one of said jaws being rigidly mounted on said means and the other of said jaws being pivotally mounted on a pin secured to said means, means for moving the pivoted jaw into gripping engagement with the fixed jaw, and means for moving the reciprocating means and the jaws in a rearward direction while the said jaws are in gripping position.

3. A tweezers comprising a casing, a reciprocating member mounted in the casing, a pair of gripping jaws carried by the member, one of the jaws being pivotally attached at a point intermediate its ends to the member and the other of said jaws being rigidly secured to said member, means for applying an outward pressure to one end of the pivoted jaw whereby the opposite end of the said jaw may be moved into gripping position.

tion with respect to the rigid jaw, means for maintaining the jaws in gripping position while they are moved rearwardly, means for moving the said member and the jaws rearwardly, and spring means for actuating the member and the jaws in a forward direction.

4. A tweezers comprising a pair of gripping jaws, a reciprocating member mounting said jaws, one of said jaws being rigidly secured to the member and the other of the jaws being pivotally mounted on the said member, means for bringing said pivotally mounted jaw into gripping position with the fixed jaw, means for moving said reciprocating member and the jaws rearwardly, spring means for actuating the reciprocating member and the jaws in a forward direction, means for separating the jaws when they are moved forwardly, and buffer means positioned to intercept the reciprocating member at the end of its forward stroke.

5. A tweezers comprising a pair of gripping jaws, a reciprocating member mounting said jaws, one of the jaws being rigidly mounted and the other of the jaws being pivotally mounted at a point intermediate its ends, reciprocating means carrying a member for moving one end of the pivoted jaw outwardly, whereby its opposite end may be moved into gripping position with respect to the rigid jaw and for maintaining said gripping relationship between the jaws as they are carried rearwardly, means carried by the reciprocating means for engaging with the said member, whereby the said member and the jaws may be carried bodily rearwardly and forwardly, electrically operated means for actuating the reciprocating means rearwardly, and spring means for actuating the reciprocating means forwardly.

6. A tweezers comprising a reciprocating member, a pair of jaws carried by the member, movable means for bringing the jaws into gripping position and for maintaining said gripping relation during the rearward movement of said jaws, a projection carried by the movable means for engaging with the reciprocating member just after the jaws are brought into gripping position and for carrying the reciprocating member and the jaws rearwardly, means for actuating the movable means rearwardly, and means for actuating the said movable means forwardly.

7. A tweezers comprising a reciprocating member, a pair of jaws carried by the member, movable means for bringing the jaws into gripping position and for maintaining said gripping position during the rearward movement of said jaws, the said movable means having a projection for engaging with the reciprocating member just after the jaws are brought into gripping position, whereby the reciprocating member and the jaws may be carried rearwardly while the jaws are in gripping position, electrically operated means for actuating the movable means rearwardly, spring means for actuating the movable means forwardly, and means carried by the movable means for separating the jaws during the forward movement of said reciprocating member and the jaws.

8. A tweezers comprising a pair of jaws, a reciprocating member mounting said jaws, one of the jaws being pivotally mounted and having a protuberance thereon, a reciprocating rod having a projection thereon for engaging with the protuberance of the jaw when the said rod is moved rearwardly, whereby the pivoted jaw may be moved into gripping engagement with the other

of said jaws, the said rod also carrying means for engaging with the reciprocating member after the jaws are in gripping engagement, whereby the said reciprocating member and the jaws may be moved bodily in a rearward direction, and means for actuating said rod rearwardly.

9. A tweezers comprising a pair of jaws, a reciprocating member mounting said jaws, one of the jaws having a protuberance thereon, which said jaw is pivotally attached to the said member, a reciprocating rod having a projection thereon for engaging with the protuberance on the pivoted jaw when the said rod is moved rearwardly, whereby the pivoted jaw may be moved into and temporarily maintained in gripping position with respect to the other of said jaws, the said rod also carrying means for engaging with the reciprocating member when the rod is moved rearwardly, whereby the said reciprocating member and the jaws may be bodily moved in a rearward direction, means for actuating said rod rearwardly, spring means for actuating the rod, the reciprocating member and the jaws in a forward direction, and means actuated by the forward movement of the rod for moving the pivoted jaw out of its gripping position with respect to the other of the said jaws.

10. In a tweezers, a casing, a pair of jaws mounted for reciprocating motion inside the casing, the gripping ends of the jaws extending externally of the casing, means for moving the jaws back and forth inside the casing, and a combined hair guide and skin protector secured to the casing and extending in front of the gripping ends of the jaws.

11. In a tweezers, a casing, reciprocating jaws mounted in the casing with their gripping ends disposed externally thereof, and means for moving the jaws in one direction comprising an armature mounted in the casing, means connecting the jaws and the armature, a solenoid associated with the armature and connected in an electrical circuit for actuating the armature, an automatically operated switch for opening and closing the circuit to the solenoid, and means actuated by the armature for automatically operating the switch.

12. In a tweezers, reciprocating jaws, means for bodily moving the jaws rearwardly, comprising an armature, means connecting the armature and the jaws, a solenoid associated with the armature and connected in an electrical circuit, a switch connected in the circuit, switch operating means adapted to be automatically actuated through the movement of the armature to open and close the switch, and spring means for automatically moving the armature, the means connecting the armature and the jaws, and the said jaws in a certain direction after they have been moved in the opposite direction when the solenoid is energized.

13. In tweezers, reciprocating jaws, means for automatically moving the jaws into and out of gripping position with respect to one another, means for bodily moving the jaws in a certain direction comprising an armature connected to the jaws, a solenoid associated with the armature and connected in an electrical circuit, a switch connected in the circuit, and switch operating means actuated by the armature for automatically opening and closing the switch.

14. In tweezers, reciprocating jaws, means for automatically closing and opening the jaws, means for moving the jaws bodily in a certain direction comprising an armature, a solenoid as-

sociated with the armature and connected in an electrical circuit, a rigid member connecting the armature and the jaws, the said member having spaced projections thereon, a switch connected in the electrical circuit having an arm thereon which is positioned between the two projections on the rigid member, the said projections and arms being so disposed with respect to one another that the said arm is engaged and

5 moved first by one of the projections and then by the other as the rigid member is moved back and forth, whereby the switch may be opened and closed when the armature is moved with reciprocating motion, and spring means for moving the armature in a forward direction after it has been moved rearwardly when the solenoid is energized. 5

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