Dec. 17, 1935. G. S. UBELHART ET AL 2,025,006

HAIR PULLING DEVICE

Filed Sept. 2, 1932

Fig. 2

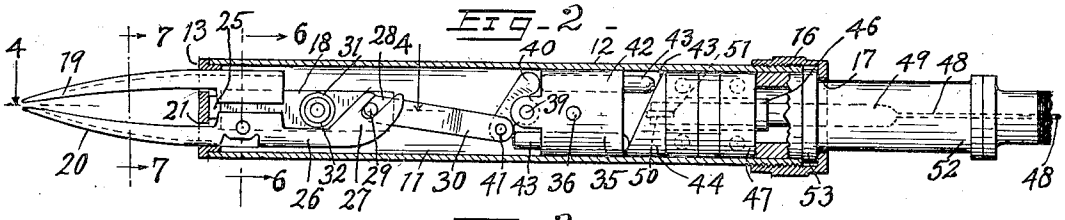


Fig. 3

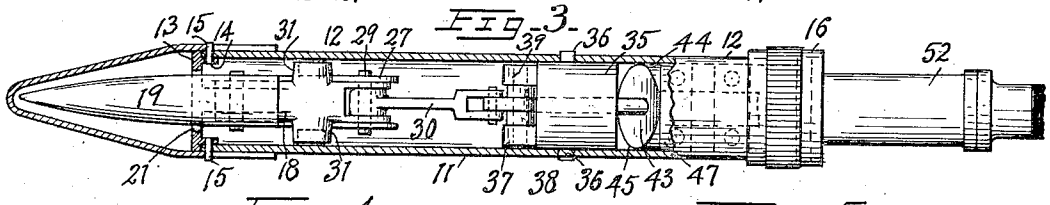


Fig. 4

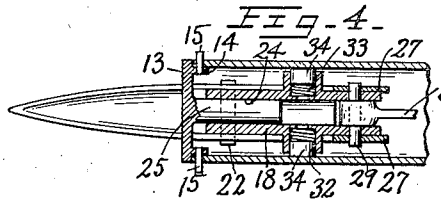


Fig. 5

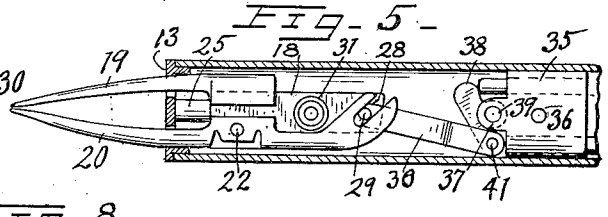


Fig. 8

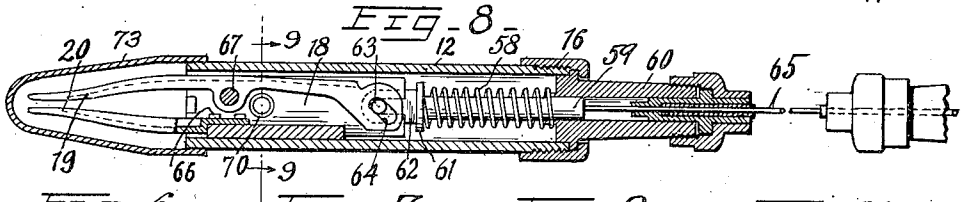


Fig. 6

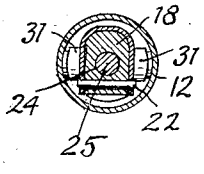


Fig. 7

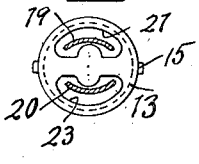


Fig. 9

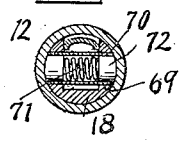


Fig. 10

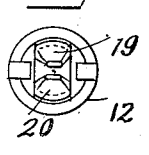
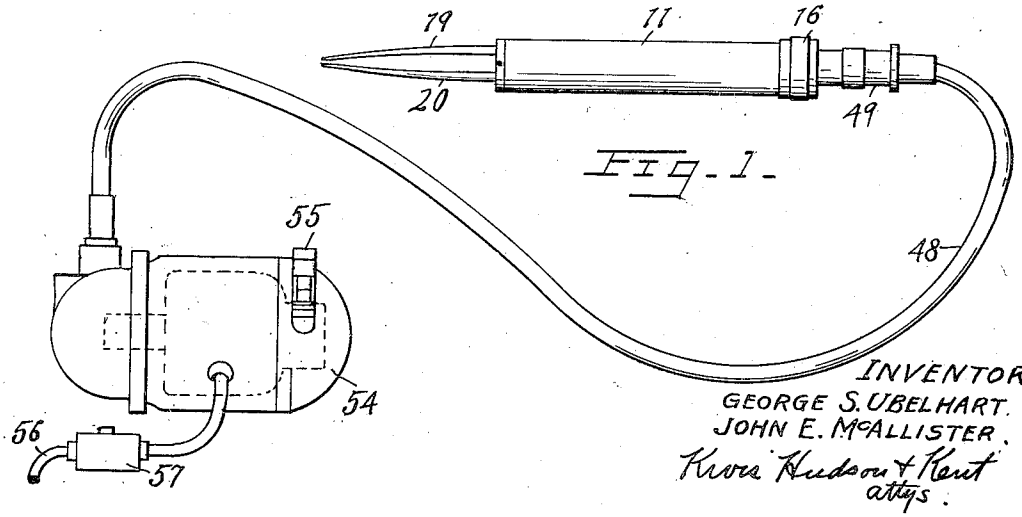


Fig. 1



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HAIR PULLING DEVICE

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Application September 2, 1932, Serial No. 631,526

20 Claims. (Cl. 128—355)

This invention relates to a hair removing device for removing superfluous hair and adapted particularly for removing eyebrow hairs by the process commonly known as "plucking" or arching and has for its primary object to produce a device which is simple in construction, efficient in operation, and inexpensive to manufacture.

Plucking of the eyebrows at present is performed by manually operated tweezers and results in considerable pain and inconvenience to the patient or recipient due to the fact that each hair is individually plucked and the extraction is relatively slow. It is therefore a further object of the invention to produce a device of the type referred to which is automatic in its operation and wherein the hair is extracted with such speed that the pain is negligible and the result much more quickly and efficiently obtained.

Another object of the invention is to produce a device of the type referred to which is power driven.

Another object of the invention is to produce a continuously operated hair pulling device.

With the objects above indicated and other objects hereinafter explained in view, the invention consists in the construction and combination of elements hereinafter described and claimed.

Referring to the drawing:

Fig. 1 is a side elevational view of a hair removing device embodying the present invention, with the power operating means therefor;

Fig. 2 is a longitudinal sectional view of the device;

Fig. 3 is a longitudinal sectional view taken on a different plane from that shown in Fig. 2;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2;

Fig. 5 is a fragmentary longitudinal sectional view similar to Fig. 2 but showing the tweezer blades in their retracted position;

Fig. 6 is a cross-sectional view taken on line 6—6 of Fig. 2;

Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 2;

Fig. 8 is a longitudinal sectional view of a modified construction embodying the invention;

Fig. 9 is a cross-sectional view taken on line 9—9 of Fig. 8; and

Fig. 10 is an end view from the tweezer blade end of Fig. 8.

In the drawing, 11 indicates a hair removing device embodying the present invention, and comprises an elongated tubular housing 12 formed of any suitable material. The device is preferably constructed in such a manner as to readily fit within the hand of an operator. One end of the tubular member 12 is closed by means of a plate 13 which has a lateral flange 14 extending circumferentially upon the inner side thereof and formed integral therewith, the diameter being such as to permit the insertion of the flange within the open end of the tubular member 12, as clearly shown in Fig. 4. The plate 13 is detachably secured to the end of the tubular member 12 by pins 15 which extend through aligned openings provided adjacent the end of the tubular member and in the flange 14, the outer ends of the pins projecting beyond the outer surface of the member for a purpose to be later described. The opposite end of the tubular member 12 is exteriorly screw-threaded and receives thereon an interiorly screw-threaded cap 16 which normally closes the end of the tubular member and is provided with an axial opening 17. This cap is for the purpose of permitting access to the working parts of the hair removing device, as will be later more fully described.

A member 18 is slidably mounted within the tubular member 12 and has secured to its forward end a pair of fingers or tweezers 19 and 20 respectively. The finger 19 is rigidly secured to the upper portion of the member 18 and extends through an opening 21 provided in the upper portion of the plate 13 and for a suitable distance therebeyond. The finger 20 is mounted for relative movement with respect to the finger 19 by means of a pivot pin 22 carried by the member 18 and similarly extends through an opening 23 in the lower portion of the plate 13 and a sufficient distance therebeyond. The free ends of the fingers 19 and 20 are disposed in close proximity and in their relative movement are adapted to be moved into engagement with one another or into engagement with a hair which is to be removed in the manner later to be described.

The member 18 has an axial bore 24 adapted to slidably receive therein the free end of a pilot 25 formed integral with the inner side of the plate 13 or otherwise secured thereto which serves to guide the fingers 19 and 20 in their reciprocating movements. The finger 20 has a portion 26 extending rearwardly from the pivot 22 which is provided with bifurcated ends 27 spaced apart as shown in Fig. 4. These ends 27 have slots 28 extending angularly and inwardly from the upper ends thereof and are adapted to receive therein the free ends of a transversely extending pin 29 carried by one end of a link 30. The co-

operation of the pin 29 with the slots 28 is such that, upon longitudinal movement of the link 30, the finger 20 is moved about its pivot 22, with the result that the finger 20 is moved toward and away from the finger 19, depending upon the direction of movement of the link 30.

The member 18 has extensions 31 projecting laterally from opposite sides thereof to a point adjacent the inner surface of the tubular member 12. These extensions have axial bores 32 which receive coil springs 33 at the bottoms of the bores and friction members 34 disposed within the bores between the coil springs 33 and contacting with the inner surface of the member 12. The springs 33 should be of sufficient strength to produce the necessary frictional resistance between the friction members 34 and the adjacent wall of the tubular member 12 so that relative movement of the fingers 19 and 20 is effected before any longitudinal movement of the fingers occurs. This construction permits the fingers 19 and 20 to be moved into hair gripping position, and then while so engaged, to cause the fingers to be moved longitudinally, thus pulling the hair. The resistance of the springs 33 determines the pressure of the cooperating fingers upon the hair which is to be pulled, so that various degrees of pressure may be obtained by substituting springs of various tensions. When the fingers 19 and 20 have been moved to their maximum innermost position, as shown in Fig. 5, the member 18 is moved in the opposite direction, or forwardly of the tubular member 12, and, due to the frictional resistance afforded by the friction members 34, the fingers 19 and 20 are first moved relatively to discharge the hair which has been pulled. This movement is then followed by the forward movement of the member 18 to its initial operating position. While a positive and variable resistance to the longitudinal reciprocation of the member 18 has been provided by the use of the friction members 34 to effect a closing of the fingers 19 and 20 about a hair prior to the pulling operation any other manner of offering a resistance to the longitudinal movements of the member 18 may be employed, such as, for instance, by providing sufficient weight in the member 18, the inertia of which must be overcome before any longitudinal movement thereof is possible. This resistance should be sufficient to cause the fingers 19 and 20 to be moved to hair gripping position before any appreciable longitudinal movement of the member 18 takes place. The cycle of operations, therefore, includes moving the fingers 19 and 20 together to grip the hair, moving the fingers rearwardly while in gripped position to pull the hair, separating the fingers 19 and 20 to discharge the hair, and moving the fingers forwardly to their initial position.

To effect such movement of the fingers 19 and 20, a member 35 is secured within the member 12 by means of a pin 36 which passes through aligned openings in the member 35 and the adjacent walls of the tubular member 12, thus preventing movement of the member. The member 35 has forwardly extending ears 37 formed integral therewith and spaced apart as shown in Fig. 3 and between which the extension 38 is disposed. The ears 37 and extension 38 are provided with aligned openings to receive a pin 39 about which the extension 38 pivots. The extension 38 has laterally extending portions 40, one of which is pivotally connected at 41 with the bifurcated end of the link 30. The member 35 has a pair of longitudinally extending bores 42, one positioned above the pin 36 and the other positioned below the pin 36, as shown in Fig. 2, which are adapted to slidably receive therein pins 43 which are of a greater length than the length of the member 35. The ends of these pins are so positioned as to be in alignment with the opposite ends of the portions 40 and to be engageable therewith in alternate relation, functioning to alternately cause reciprocation of the member 18 in opposite directions.

A cam 44 is positioned within the member 12 and has an angularly extending surface 45 adapted to be engaged by the opposite ends of the pins 43. This cam has a hollow shaft 46 extending axially thereof and is rotatably journaled in spaced bearings 47 mounted within the member 12. A flexible cable 48 has one of its ends secured to a member 49 which has its free end extending within the tubular shaft 46 and is provided with a slot 50 engageable with a key 51 secured to the cam 44. An enclosure 52 for the cable and member 49 is provided and has a flange 53 which fits within the cap 16 and is held in rigid engagement with the adjacent end of the tubular member 12. The opposite end of the flexible cable 48 is connected with an armature of a motor 54 through a suitable gear reduction or directly, if desired, by which rotation is imparted to the cam 44 for alternately reciprocating the pins 43. A speed control 55 may be provided upon the motor to obtain the desired speed and energy and the motor may be supplied with current from any suitable source through a cable 56 controlled by a button switch 57.

In Figs. 8, 9 and 10 a modification of the device embodying the invention is disclosed but which operates precisely on the same principle, that is, the cycle of operations is the same but the manner of operating the device is somewhat different. In this construction, the members 19 and 20 are maintained in their initial position by means of a coil spring 58 which surrounds a rod 59 slidably mounted within a member 60 secured at one end of the tubular member 12 by means of the cap 16. One end of the coil spring abuts the adjacent inner end of the member 60, while the opposite end of the spring abuts a collar 61 formed integral upon the opposite end of the pin. The pin 59 beyond the collar 61 is provided with an extension 62 within which is secured a transversely extending pin 63 the free ends of which are disposed within angularly extending slots 64 formed in the pivoted finger 20. The tension of this spring 58 tends to urge the slidable member 18 forwardly, and a flexible cable 65, which has one of its ends secured to the member 59, tends to move the movable member 18 in the opposite direction against the resistance of the spring 58. The opposite end of the cable 65, in this construction, is connected to the motor 54 through the medium of an eccentric connected with the armature of the motor so as to cause movement of the flexible cable 65 longitudinally.

The finger 19 is secured to the slidable member 18 by means of bolts 66 which are readily removable by removing the pivot pin 67 of the pivoted finger 20. Furthermore, in this connection the member 18 is provided with a transversely extending bore 69 within which is secured a tubular member 70. Within the tubular member 70 is a single coil spring 71, the opposite ends of which abut with the adjacent ends of friction members 72 which in turn engage the adjacent wall of the member 12.

In the operation of the device, the motor 54 is

started, which causes either rotation of the flexible cable 48 or reciprocable movement of the flexible cable 65, depending upon which device is being employed. In the former, this causes the cam 47 to be rotated, which alternately reciprocates the pins 43 and likewise causes alternate reciprocating movement of the portions 40 upon the extension 38. As one of the portions 40 is pivotally connected to the link 30, the member 18 is likewise reciprocated, and, due to the frictional resistance offered by the friction members 34, the first movement of the link 30 causes the fingers 19 and 20 to be moved relatively into engagement with a hair which is to be pulled. Further movement of the link 30 causes the member 18 to be moved longitudinally within the member 12, thus moving with it the fingers 19 and 20 which, still gripping the hair, tends to pull the same. At the end of this movement, the movement is reversed, with the result that with the first movement of the link 30 the fingers 19 and 20 are moved apart, releasing the hair, as the friction members 34 resist the movement of the slidable member 18, and then further movement of the link 30 returns the fingers 19 and 20 to their initial position.

It has been found desirable to operate the fingers 19 and 20 at approximately 1300 R. P. M. of the flexible cable, but of course different conditions may require that the cable be operated at different speeds.

As the cycle of operations is performed at such high speeds, it will be readily apparent that the hair is extracted so quickly that it is almost impossible to detect any pain accompanying the same, and where the operation of plucking eyebrows now consumes several hours time, this device makes it possible to perform the same job within a few minutes time.

A cap 73 is mounted upon the end of the device so as to enclose the fingers and prevent damage thereto in case of dropping or otherwise. This cap may be secured by bayonet slots and cooperating pins, as shown in Fig. 2, or by merely frictional engagement, as shown in Fig. 8.

While we have described the preferred embodiments of the invention, it is to be understood that we are not to be limited thereto inasmuch as changes and modifications may be resorted to without departing from the spirit of the invention as defined in the appended claims.

Having thus described our invention, we claim:

1. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip and release a hair and resistably slidable in opposite directions in said housing, power actuated means, and a flexible shaft operatively connecting said power-actuated means with said members for causing positive relative movement between said members to grip and release a hair and subsequent slidable movement thereof within said housing in opposite directions.

2. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and resistably slidable in said housing, and cam actuated means operatively connected with said members for causing relative movement therebetween and subsequent slidable movement within said housing.

3. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, means for resisting the slidable movement of said members, and means operatively connected with said members for causing relative movement therebetween and subsequent slidable movement within said housing.

4. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, replaceable means for resisting the slidable movement of said members, and means operatively connected with said members for causing relative movement therebetween and subsequent slidable movement within said housing.

5. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, means for resisting the slidable movement of said members, and power actuated means operatively connected with said members for causing relative movement therebetween and subsequent slidable movement within said housing.

6. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, means for resisting the slidable movement of said members, means operatively connected with said members for causing relative movement therebetween and subsequent slidable movement within said housing, and means for returning said members to their initial position.

7. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, means for resisting the slidable movement of said members, and motor actuated means operatively connected with said members for causing relative movement therebetween and subsequent slidable movement within said housing.

8. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, a member rigidly secured in said housing and having slidable members operatively associated with said cooperating members, and a cam rotatably mounted in said housing and engageable with said slidable members for actuating the latter.

9. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, a member rigidly secured in said housing and having slidable members operatively associated with said cooperating members, and a power driven cam rotatably mounted in said housing and engageable with said slidable members for actuating the latter.

10. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, a member rigidly secured in said housing and having slidable members operatively associated with said cooperating members, a cam rotatably mounted in said housing and engageable with said slidable members for actuating the latter, and means for rotating said cam.

11. A hair removing device comprising a housing, a pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, a member rigidly secured in said housing and having slidable members operatively associated with said cooperating members, and a cam rotatably mounted anti-frictionally in said housing and engageable with said slidable members for actuating the latter.

12. A hair removing device comprising a housing having screw-threads at one end thereof, a

pair of cooperating members movable relatively to grip a hair and slidably mounted in said housing, said member having end portions extending beyond the opposite end of said housing, means for frictionally resisting the slidable movement of said members, means operatively connected with said members for moving said members relatively and subsequently slidably within said housing, and a screw-threaded cap engageable with the screw-threaded end of said housing.

13. A hair removing device comprising a pair of cooperating members adapted to grip, pull and release a hair, reciprocable means operatively connected with said members for causing such movements of said members, a motor, a flexible shaft connecting the motor with said last mentioned means for positively moving the latter in both directions to actuate said members in their movements of gripping, pulling and releasing a hair.

14. A hair removing device comprising a pair of cooperating members adapted to grip a hair, one of said members being pivotally mounted, means supporting said members for slidable movement in opposite directions, a rod having one end connected to said pivoted member by a pin and slot connection, and a motor operatively connected to the opposite end of said rod for reciprocating the latter.

15. A hair removing device comprising a housing, a slidable member mounted in said housing, a pair of cooperating members secured to said slidable member and having hair gripping ends projecting beyond one end of said housing, one of said members being pivotally connected, a rod having one end operatively connected to said pivoted member for causing the latter to oscillate about its pivotal axis, and means for reciprocating said rod.

16. A hair removing device comprising a housing, a slidable member mounted in said housing, a pair of cooperating members secured to said slidable member and having hair gripping ends projecting beyond one end of said housing, one of said members being pivotally connected, a rod, a pin and slot connection between one end of said rod and said pivoted member for causing the latter to oscillate about its pivotal axis, and means operatively connected to the opposite end of said rod for reciprocating the latter.

17. A hair removing device comprising a housing, a slidable member mounted in said housing, a pair of cooperating members secured to said slidable member and having hair gripping ends projecting beyond one end of said housing, one of said members being pivotally connected, a rod, a pin and slot connection between one end of said rod and said pivoted member for causing the latter to oscillate about its pivotal axis, and a motor operatively connected to the opposite end of said rod for continuously reciprocating the latter.

18. A hair removing device comprising a housing, a slidable member mounted in said housing, a pair of cooperating members secured to said slidable member and having hair gripping ends projecting beyond one end of said housing, one of said members being pivotally connected, a rod, a pin and slot connection between one end of said rod and said pivoted member for causing the latter to oscillate about its pivotal axis, a hollow tubular member within which said rod is disposed, and means operatively connected to the opposite end of said rod for reciprocating the latter.

19. A hair removing device comprising a housing, a resistable slidable member mounted in said housing, a pair of cooperating members secured to said slidable member and having hair gripping ends projecting beyond one end of said housing, one of said members being pivotally connected, a rod having one end operatively connected to said pivoted member for causing the latter to oscillate about its pivotal axis, and means for reciprocating said rod.

20. A hair removing device comprising a housing, a slidable member mounted in said housing, a pair of cooperating members secured to said slidable member and having hair gripping ends projecting beyond one end of said housing, one of said members being pivotally connected and having an angularly extending slot in the inner end thereof, a rod having a pin at one end operatively disposed in said slot and adapted to oscillate said member about its pivotal axis, and means for reciprocating said rod.

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