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S. SEGAL

TWEEZERS

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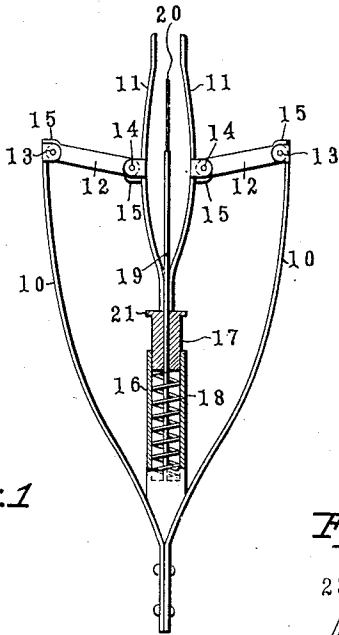


Fig. 1

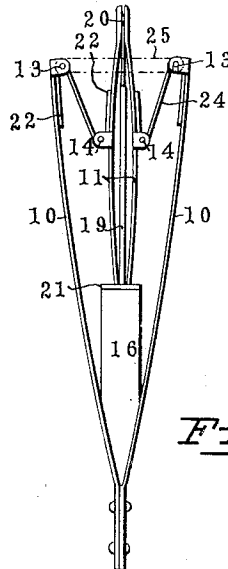


Fig. 3

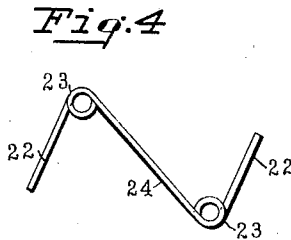


Fig. 4

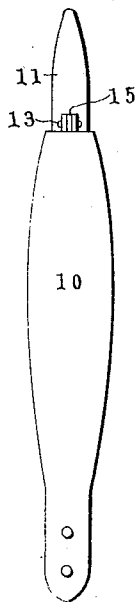


Fig. 2

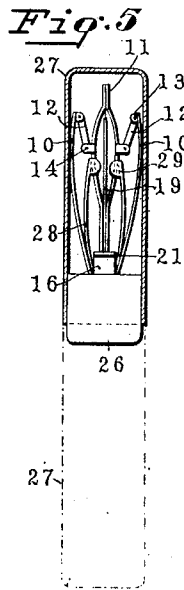


Fig. 5

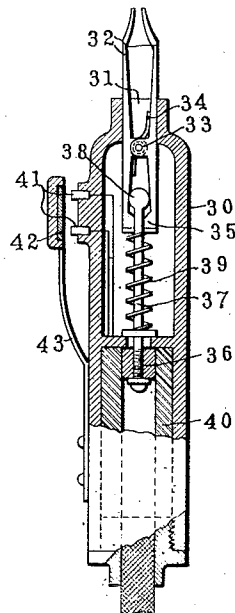


Fig. 6

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TWEEZERS.

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This invention relates to an improved tweezer.

It is an object of the present invention to provide a device of the type stated by means of which a particle of foreign matter, hair, etc., may be gripped and removed from the surface or body in which it is embedded or rooted.

A further object is that of providing a tweezer in which the member to be removed will be withdrawn in its entirety.

A still further object is that of constructing a device of the character stated, in which the entire operation will be performed in such a manner as to be nearly painless as possible.

Another object is that of providing a tweezer which will efficiently perform the purposes for which it is intended, and which will also be economically and readily manufactured and assembled.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a partly sectional side elevation of one form of the invention and showing the device in its open position;

Fig. 2 is an edge view thereof;

Fig. 3 is a view similar to Fig. 1, but showing another form of the invention and illustrating the device as being in its closed or retracted position;

Fig. 4 shows in detail one of the elements of construction utilized in connection with the device as shown in Fig. 3; and

Figs. 5 and 6 are sectional side views of other forms of the device constructed in accordance with the terms of the present invention.

While the present invention aims to provide an instrument primarily intended for use as a toilet article, or in fact for surgical use, it will be appreciated that the same

might be employed to advantage in connection with mechanical work. However, in the annexed description the various operative examples given are such as would occur in connection with the first mentioned uses.

Thus, referring to Figs. 1 to 5, it will be noted that the reference numeral 10 indicates a spring yoke which may include a pair of resilient arms attached together adjacent one of their ends, their opposite ends being materially spaced. Disposed between these arms is a pincette 11, including in the usual manner a pair of spring gripping elements, and it is intended that the yoke afore-described may be in the nature of an actuating element, while the pincette acts as a gripping member between the jaws of which splinters, hairs and other small particles of matter may be gripped and subsequently removed from the body in which they are lodged or imbedded.

In order to accomplish this result, it will be noted, reference being had particularly to Figs. 1 and 2, that the ends of the pincette extend materially beyond the ends of the arms forming the yoke member, and these elements are connected together by means of links 12, which have their outer ends pivotally attached as at 13 to the yoke arms adjacent the outer ends of the latter, while their inner ends are pivotally attached as at 14 to the outer faces of the pincette legs.

As a consequence and due to the inherent resiliency of the yoke arms, as well as such resiliency as may be incorporated in the pincette, the former will tend to normally remain in the position shown, and as a consequence the jaws of the latter will be separated. In order to prevent the parts from moving beyond the position shown in Fig. 1, i. e., the position in which the links extend slightly rearwardly, it will be observed that the ends of the links 12 in the present instance are extended beyond the points of pivotal attachment 13 and 14, as has been indicated at 15, so that they may contact against the adjacent surfaces of the yoke and pincette. As a consequence, while the pincette may be retracted in a manner hereinafter brought out, any projection of the same is necessarily limited by the stops provided by this expedient.

Thus it will be apparent that if the yoke arms are moved towards each other, this action will result in the jaws being brought

towards each other and in the pincette being subsequently projected rearwardly towards the point of attachment of the yoke arms to each other.

5 It is desirable in most instances that the adjacent surfaces of the jaws should be brought into actual and intimate contact before the pincette is projected rearwardly. In other words, assuming that it is desired
10 to remove a foreign substance or particle, this element must necessarily be tightly gripped before it may be removed from the body with which it is associated. In order to accomplish this action of the parts, as
15 well as to properly guide the movements of the pincette, it will be observed in the present instance that a sleeve 16 is carried at the point of connection of the yoke arms and extends outwardly between the same. Projecting into the open end of this sleeve is a
20 plug 17, to which the inner end of the pincette is firmly attached, and a spring 18 is interposed between the inner end of the plug 17 and the base of the sleeve 16, so that
25 these elements tend to move in opposite directions.

Due to the fact that the spring 18 exerts a pressure in excess of any pressure exerted by the legs of the pincette, and further due
30 to the fact that in the normal or initial position of the parts the links 12 extend almost parallel to the lines of thrust exerted by the pressure upon the yoke, this pressure will initially cause the jaws of the pincette to be
35 brought into intimate contact. However, after the jaws have been brought to position adjacent each other, and as a consequence the movement of these members toward each other is interrupted, a continued movement
40 of the yoke arms towards each other will necessarily result in the pincette being moved bodily towards the point of juncture of the yoke arms and against the counteracting tendency of the spring 16—it being obvious,
45 due to the guiding influence exerted by the plug and sleeve, that the movement of the tweezer will be confined to a proper path.

From the foregoing, it will be appreciated in using a device constructed similarly to
50 that shown in Figs. 1 and 2, that an operator will simply grasp the actuating member and bring the points of the jaws to a position adjacent the particle or element to be withdrawn. Thereupon by simply squeezing
55 the member, i. e., moving the yoke arms towards each other, the element to be removed will be gripped between the jaws and a continued squeezing of the actuating member will cause the gripped element to be removed incident to the bodily retraction of
60 the pincette.

If it is desired, means may be provided for now automatically eliminating the gripped particle or hair from between the
65 jaws. In the present instance, this has been

accomplished by the use of a wiper which may be furnished by employing a rod 19 conveniently affixed to the yoke member and extending through the sleeve and slidably
70 contacting with a bore formed in the plug. This rod extends beyond the plug and lies between the jaws and has its outer end terminating at a point short of the outer ends thereof, it being observed that this outer
75 rod end is in the nature of a wiper blade 20. Thus, upon the parts being actuated in the manner described in the preceding paragraph, it will be understood that the wiper will remain relatively stationary, and as a
80 consequence movable with respect to the pincette. As a result, when the element gripped by the jaws has been moved to a certain extent inwardly and well clear of the body from which it has been withdrawn,
85 this part will be contacted by the wiper blade 20 and thus be eliminated from a position between the pincette jaws—it being here noted that if desired a further stop may be incorporated in the device by flanging
90 the plug 17 adjacent its upper edge as at 21, so that it will contact with the outer edge of the sleeve in order to limit the inward movement of the pincette.

It will be obvious that in commercial manufacture numerous different forms of the
95 invention might be made. For example, it might be found to be more economical to incorporate an extremely limited amount of resiliency in the legs of the yoke member, and to have a spring influence embodied in
100 the members which connect the outer ends of the yoke arms with the pincette jaws. One practical manner of accomplishing this result has been depicted in Figs. 3 and 4. In this type of construction, it will be noted
105 that similarly to the device shown in Figs. 1 and 2, the tweezer may include a yoke member, pincette and guide construction, and also if desired a wiper may in certain instances be employed to advantage. However,
110 contrary to the construction aforementioned, the type of link shown in Figs. 1 and 2 is preferably discarded, and a link of the nature illustrated in Fig. 4 is substituted. This link in the illustrated embodiment embraces
115 a resilient wire having its ends 22 extending adjacent to and bearing against the opposite surfaces of the yoke and pincette members. Adjacent the inner parts of these end portions the wire may be coiled
120 as at 23 in order first to enhance the spring effect achieved, and second to anchor the wire to the instrument by virtue of having these coiled portions passing around the pins, which as in the construction shown in
125 Figs. 1 and 2, provide the points of pivotal attachment of the links to the apparatus. The body portion 24 of the wire is thus brought to extend between the yoke and pincette arms and obviously connects the two
130

so that the desired effect is achieved, and the parts will normally tend to remain in their open position.

In using an instrument of this type, it will be appreciated that similarly to that form of tweezer described in connection with Figs. 1 and 2, a compressing of the yoke member will cause an initial contacting of the pincette jaws and a subsequent retraction of the pincette, until the same finally reaches a point at which its further movements are limited by means of the stop afore-described, and in which position the wiper will act to eliminate any gripped particle from between the pincette jaws.

In certain instances, it may be found desirable to maintain the parts normally in the position shown in Fig. 3, and in order to achieve this result any suitable confining element may be utilized, which may take the form of a strip of material 25 suitably connected to the outer ends of the yoke arms, thus serving to retain the latter in positions at which they will be most nearly adjacent each other.

It will also be noted, reference being had to Fig. 5, that similarly to the constructions described in the preceding figures, and particularly Figs. 1 and 2, the tweezer may include yoke and pincette elements connected together by links and a slidable plug and sleeve construction. In the present figure, however, the sleeve and consequently all operating units of the device, are carried by a base 26 which is of a size permitting of the application of a cap 27 thereto. This cap will bear against the outer faces of the yoke arms and prevent their assuming a normal position, so that it might be said that the cap will act as a confining agent. Furthermore, in this type of construction as well as in any of the foregoing types, it will be understood that in order to assure a proper cooperation between the pincette jaws, a cam construction may be utilized. In the present instance, this construction embraces a pair of spring arms 28, which have their inner ends connected with the base 26, their outer ends terminating in channel portions 29 slidably engaging the outer and side faces of the pincette legs when this part of the instrument is in retracted position. Thus, while the pincette may be free of engagement with the channel portions of the arms 28 when the tweezer parts are in the position shown in Fig. 1, it will be obvious that as the pincette begins to move rearwardly, i. e., to be retracted, a firm cooperating engagement will be established between these arms, and due to the cam action which will take place at this point, the jaws will be forced together with increasing intimacy, so that an accidental dislodgment of the gripped particle will be virtually precluded, a release of the particle not being

effected until the wiper blade performs its function.

Finally, referring to Fig. 6, it will be seen that the invention also lends itself to the construction of an electrically operated tweezer. In this view, the reference numeral 30 indicates a casing, which may be formed with a suitable opening 31 through which the jaw portions of a pincette 32 extend. These jaw portions are continued in the form of legs pivotally connected together as at 33, and a spring 34 may normally serve to maintain the jaws out of contact with each other, it being noted that the rear ends of the tweezer legs terminate in blocks 35, having their outermost faces inclined rearwardly and inwardly. An armature 36 is also provided which, by means of a rod 37, is connected with a spherical member 38 extending between and normally beyond the aforementioned faces of the blocks 35, and it will be perceived that a spring 39 is preferably interposed between the outer edge of a solenoid 40 and the inner ends of the pincette legs, in order to normally maintain the latter elements in the position shown. A suitable source of energy is arranged in circuit with the solenoid 40, and this circuit has a gap, the ends of which are defined by contacts 41. A contact bridging member 42 may be carried by a spring arm 43, the inner end of which is attached to the casing 30, and thus it will be understood that an operator may simply grip this casing and by squeezing the same the circuit closer 42 will be brought to a position at which it will engage the contacts 41, thus closing the circuit through the solenoid 40.

In using a device of this character, it will be understood that the jaws of the pincette are initially brought to a position adjacent the particle or element to be removed, and thereupon the contact bridging member is caused to close the circuit. This will obviously result in the solenoid 40 being energized, thus throwing the armature 36 inwardly and as a consequence drawing the rod 37 and the spherical member 38 in a similar direction. This latter action will initially result in the spherical member engaging the upper faces of the block 35 to thus cause the legs of the pincette to be rocked around their point of pivotal connection and as a consequence to cause the jaws to engage the particle to be gripped. Immediately subsequent to this action of the parts and due to the continued movement of the armature the pincette will obviously be retracted against the action of the spring 39 so that the gripped particle will be removed from the body into which it extends.

In operating all of the foregoing forms, it will be appreciated that the initial actuation of the parts will merely result in an engagement of the particle to be gripped, this en-

gagement being extremely positive and more than ample for the purpose of withdrawing the particle, and immediately subsequent to this gripping action the gripped element will be withdrawn by the rearward snapping of the pincette.

From the foregoing, it will be appreciated that the objects of this invention have been accomplished, and since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is 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.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. A tweezer, including, in combination, a pair of gripping jaws, means mounting said jaws, means forming a part of said mounting means for resisting bodily rearward movement thereof, and means for moving said jaws into gripping position and subsequently forcing the same bodily rearwardly against the resistance of said means.

2. A tweezer, including a pair of gripping jaws, a pair of actuating arms extending into a plane short of the outer ends of said jaws, links between said arms and jaws and connected with said elements, and means for slidably mounting said jaws.

3. A tweezer, including, in combination, a pair of gripping jaws, a pair of arms extending adjacent said jaws, a spring mounted by said arms and cooperating with said jaws to resist rearward movement of the latter, and means connecting said arms with said jaws to force the latter into engagement and rearwardly against the action of said spring when said arms are moved toward each other.

4. A tweezer, including a pair of gripping jaws, a pair of arms extending adjacent the same, a housing carried by said arms, a spring associated with said housing and cooperating with said jaws to resist rearward movement of the latter, and links extending between said arms and jaws to cause the latter to move into engagement and be moved bodily rearwardly against the resistance of said spring upon said arms being moved toward each other.

5. A tweezer, including a pair of gripping jaws, a pair of arms extending adjacent the same, links connecting said arms with said jaws and extending rearwardly with respect thereto, and means for guiding said jaws whereby upon said arms being moved to-

ward each other said jaws will be correspondingly moved and shifted rearwardly with respect to said arms.

6. A tweezer, including, in combination, a pair of gripping jaws, a pair of actuating arms, links connecting said arms with said jaws to move the latter into contact and rearwardly with respect to said arms, and means associated with said arms and extending between said jaws during the retraction thereof to eliminate any gripped particle.

7. A tweezer, including a pair of gripping jaws, means for moving said jaws into gripping position, means for maintaining the position of said jaws during such movement, and means acting subsequently to the jaws assuming such position to move the same bodily rearwardly to a material extent.

8. A tweezer, including, in combination, a pincette, a yoke extending adjacent said pincette, and links extending between said yoke and the legs of said pincette and pivotally connected to each of the same.

9. A tweezer, including, in combination, a pair of jaws, manually-operable means for moving said jaws towards each other and bodily retracting the same, and wiping means extendible between said jaws to remove a gripped particle therefrom during their retraction.

10. A tweezer, including in combination, article engaging means, means for actuating said means, and means contactible with said engaging means for positively eliminating an article therefrom.

11. A tweezer, including, in combination, a pincette, a yoke extending adjacent said pincette, a pair of links having their outer ends connected to said yoke adjacent the outer ends of the latter, their inner ends being pivotally connected to the jaws of said pincette, and means forming a part of said tweezer to normally maintain the pincette in projected position with its jaws separated.

12. A tweezer, including in combination, article gripping means, actuating means therefor, means tending to project said gripping means, and means associated with said actuating means whereby upon the latter being operated said gripping means will grasp an article and be subsequently materially retracted against the tendency of said projecting means.

13. A tweezer, including in combination, article gripping means, actuating means therefor and including parts movable towards and away from each other, means tending to project said gripping means, and means associated with said actuating means whereby upon the latter having its parts moved towards each other said gripping means will grasp an article and be subsequently materially retracted against the tendency of said projecting means.

14. A tweezer, including, in combination,

a pincette, a yoke extending adjacent said pincette, a housing carried by said yoke, links extending between and connected with said yoke and pincette, and a spring extending
5 into said housing and acting against said pincette to normally project the same.

15. A tweezer, including in combination, a pincette, a yoke extending adjacent said pincette, links extending between said yoke
10 and the legs of said pincette, and means for

normally maintaining the jaws of said pincette in separated condition.

16. A tweezer, including, in combination, a yoke comprising a pair of arms, a housing extending from between said arms, a pincette, and links extending between the arms
15 of said yoke and the legs of said pincette, said pincette being guided by said housing.

In testimony whereof I affix my signature.

SAMUEL SEGAL.