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ELECTRICAL CUTTING INSTRUMENT

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Fig. 1.

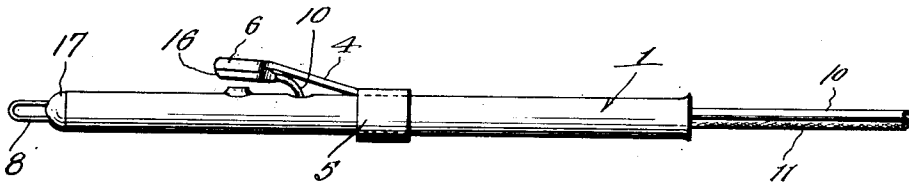


Fig. 2.

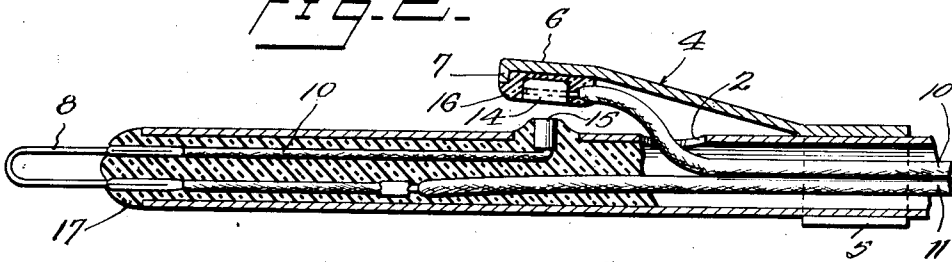
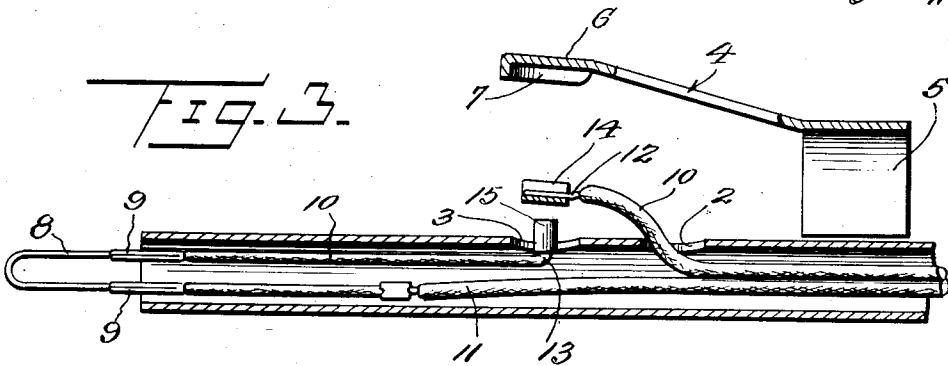


Fig. 3.



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ELECTRICAL CUTTING INSTRUMENT

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4 Claims. (Cl. 219—31)

This invention relates to electrical instruments and pertains particularly to an improved electrical knife.

5 The present invention has for its primary object to provide an electrical cutting instrument designed for performing various operations on human beings or animals, where steel cutting instruments have previously been used, whereby such operations may be performed cleanly without pain or bleeding, and in which instrument novel means is provided for passing electric current through a switch device to the working or cutting tip of the instrument in such a manner that the instrument may be used with complete safety by the operator.

10 A further object of the invention is to provide an electrical cutting instrument in which a body having a cutting electrode at one end, carries a resilient arm to which is attached an electric switch terminal which is adapted to be brought into contact, by the flexing of said arm, with the adjacent switch terminal, which is carried by and insulated from the body, when it is desired to pass an electric current through the electrode.

15 The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a view in side elevation of the improved instrument embodying the present invention.

40 Fig. 2 is a view in longitudinal section through the complete instrument.

45 Fig. 3 is a view in longitudinal section of the partly assembled instrument, showing the relation of the several parts and without showing the insulation material which forms part of Fig. 2.

Referring now more particularly to the drawing, the numeral 1 generally designates an elongated body which is preferably formed of metal of suitable character such as aluminum or the like. The body is open at both ends and at a point intermediate its ends it is provided with the two openings 2 and 3. These openings are in spaced relation on a line extending longitudinally of the body.

55 The numeral 4 designates a resilient switch arm which has one end attached in any suitable manner to the body 1. In the present embodiment of the invention the arm 4 is provided with a pair of lateral wings, one of which is shown and indicated by the numeral 5 and the body is dis-

posed between these wings and the latter bent in around the body and secured thereto in any desired manner, as by welding, soldering or the like. At its opposite and free end the arm has a terminal portion 6 which is in angular relation with the main body portion thereof, and this terminal portion is partially encircled by a flange 7 which is directed toward the body 1 to form a cup-like device for the purpose hereinafter described.

10 The end of the body 1 remote from the part 5 of the resilient arm may be termed the forward or head end. This end has extending therefrom a suitable electrode 8 formed of a wire material of a character to offer a high resistance to the passage of electric current and thus become heated to incandescence or to a sufficient temperature to facilitate its use in cutting or severing tissue.

15 This electrode has the two terminals 9, and there is passed into the end of the body remote from the electrode 8 the two current conductors 10 and 11. One of these conductors passes straight through the body to one of the terminals 9 while the other conductor is divided in the area between the ends of the body to form the terminals 12 and 13, and each of these terminals is secured to an electric contact element, the elements being designated respectively 14 and 15. As shown, the resilient arm 4 is attached to the body 1 in such a manner that the cup-like terminal portion 6 overlies the aperture 3 which is nearest the head end of the instrument and the contact 15 extends through the opening 3 while the portion of the conductor 10 to which the contact 14 is attached, passes out through the opening 2 and forwardly so as to bring the contact 14 into position between the end 6 of the resilient arm and the contact 15. This contact 14 is cemented in the flange-outlined area of the portion 6 of the resilient arm, as indicated at 16, and this cement is of suitable insulation material so as to maintain the contact 14 free from electrical connection with the arm 4. This material is also of such character as to stand a high degree of heat without softening or being broken down in any manner that would destroy its insulating qualities.

20 The body 1 is also filled with insulating material, as indicated at 17, from the forward end rearwardly so far as the second opening which is indicated by the numeral 2. This insulating material in the body keeps the terminals 9 and the wire conductors connected therewith, from contact with the metal body 1, and as shown in Fig. 2 the insulation material is built up around the contact 15 and projects through the opening 3 slightly so that the contact 15 will be amply protected against electrical connection with the body 1. The resilient character of the arm 4 is such as to normally maintain the contact 14

raised away from the contact 15 and when the instrument is in use it will be held in the hand in such manner that one of the fingers may be employed for depressing the contact 14 to bring the contacts 14 and 15 into electrical engagement. The resilient character of the portion of the conductor 10 leading to the contact 14 allows for the free movement of this contact relative to the contact 15 without damage to any of the current conducting parts. It will also be apparent that with the novel arrangement here disclosed the body of the instrument may be made of metal and the instrument may be used with absolute safety as no current passes through the body or through the switch arm and therefore there is no possibility of the electric current entering the hand of the person using the instrument.

The present instrument while particularly novel in the manner in which the parts are assembled, particular reference being made to the switch unit whereby the current flowing to the cutting tip 8 can be controlled conveniently and without danger of the operator becoming burned or shocked, is broadly directed to an improved cutting instrument whereby various operations may be performed, such as the dubbing of the wattles and combs of chicks of all sizes or birds without the usual bleeding and pain which is attendant upon the use of scissors or knives for performing this operation. The use of the electric knife also stops the further growth of these parts while other methods do not.

The present instrument may also be used for sexing baby chicks of an age of two weeks or less, by which is meant the operation of opening the sides of the chicks to determine the sex of the same. Naturally in the performance of this operation, if it is found desirable to do so, the chicks may be caponized by the removal of the glands or they may be released and the area which has been opened will heal up more rapidly and with less discomfort to the chick than would be the case if a cutting instrument had been employed.

Various other uses may be made of the present instrument such as the marking or temporary branding of cattle which are to be shipped so that the cattle belonging to a particular owner may be separated from the cattle of other owners. In addition, the instrument finds wide use in opening boils and abscesses by reason of the fact that such operations can be performed without pain and, due to the cauterizing action of the heated electrode, without bleeding.

Use may also be made of the present instrument by dentists who find it necessary to use heated instruments in the making and repairing of dentures as well as in opening abscesses or cauterizing sores where such an operation is found desirable.

I claim:

1. In an electrical instrument of the character described, an elongated hollow body, a two-terminal electrode carried at one end thereof, an electric current conductor connected with one of said terminals and passing through the body, switch means having two contacts, one of which contacts is separate from and exposed on the outside of the body, an electrical connection between the other electrode terminal and said one contact, resilient arm carried by the body and carrying the other contact in insulated relation therewith and normally maintaining the same in spaced relation with the first mentioned contact,

and current conducting means passing through the body to the said other contact.

2. An electrical instrument, comprising a tubular body having its ends open and having a pair of apertures in the wall thereof, a two-terminal electrode disposed at one end of the body with the terminals extending into the body, a pair of electric current conductors passing longitudinally through the body from the other end thereof and each electrically join with an electrode terminal, one of said conductors being divided at a point between the ends of the body to form two adjacent conductor ends, a contact element carried by each of said conductor ends, one of said contact elements being extended through an aperture of the body, the portion of the conductor end carrying the other contact element being extended through the other aperture of the body and longitudinally thereof to bring the contact carried thereby in superposed relation with the adjacent contact, insulation material filling the body from the end adjacent the electrode to the aperture through which the first mentioned contact extends, a resilient arm secured at one end to and extending longitudinally of the body over the said portion of the conductor carrying the other contact and having its other end overlying the spaced contacts, and insulation material cementing the said other one of the spaced contacts to the free end of the resilient arm between the arm and the body.

3. An electrical instrument, comprising an elongated body of tubular material, a cutting electrode having a looped portion and two terminal portions, said terminal portions extending into one end of the tubular body, an insulation material filling the said end of the tubular body and electrically insulating said terminals from the body, an electrical conductor extending through the body from the other end thereof and having electrical connection with one of said terminals, a pair of electric contacts, one of which is secured to and insulated from the body and has electrical connection with the other terminal, a resilient arm fixed at one end to the body and having the other contact fixed to the other end upon the side nearest the body and in spaced relation with the fixed contact, and electric current carrying means extending through the body to and having electrical connection with said other contact from the under side of the arm.

4. An electrical cutting instrument comprising a hollow body constituting a handle, an electrical resistance wire projecting from the body and having two terminals housed within the same, a switch contact electrically connected with one terminal and exposed through a side of the body, a resilient switch arm attached at one end to the body and having its other end overlying said contact, an electric current conductor passing through the body and coupled with the other terminal, a flange integral with the switch arm at its free end and extending along the two sides and across the end forming a receptacle which opens toward the body, an insulation material in said receptacle, a switch contact embedded in said material and exposed for engagement with the first contact, and an electric current conducting wire leading from within the body through an aperture beneath said arm and running lengthwise of the arm to the contact carried at the free end thereof, said wire being free to flex with the arm when the arm is flexed for the purpose of bringing said contacts together.

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