Jan. 7, 1941. F. L. CREAGER 2,227,574

SOUND TRANSLATING DEVICE

Filed Oct. 31, 1939

Fig. 1

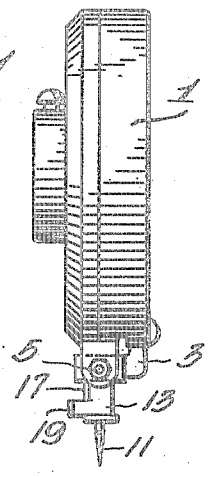


Fig. 2.

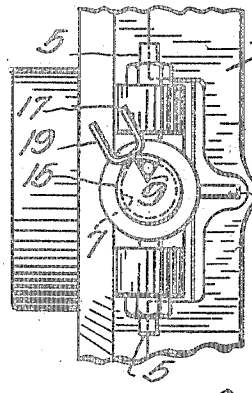


Fig. 5.

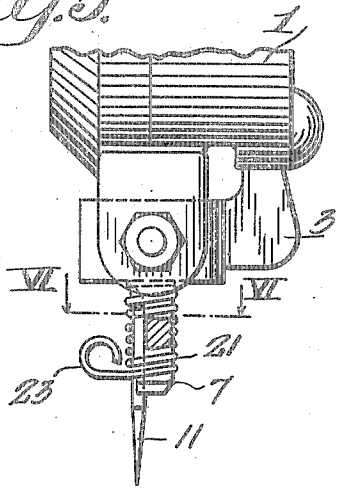


Fig. 3.

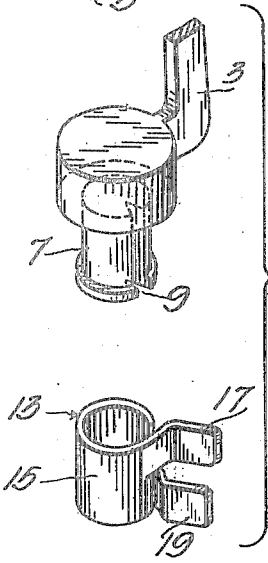


Fig. 4.

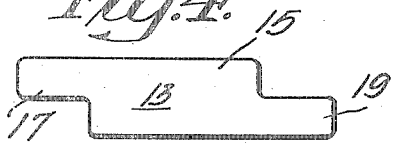
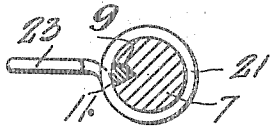


Fig. 6.



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2,227,574

UNITED STATES PATENT OFFICE

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SOUND TRANSLATING DEVICE

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Application October 31, 1939, Serial No. 302,211

9 Claims. (Cl. 274—37)

This invention relates to sound translating apparatus, and more particularly to needle-clamping means in sound boxes, pickups, and the like.

It is well known that the needle of a sound translating device must be held in the needle socket firmly in position in order that the vibrations derived from the actuating device therefor may be properly transmitted thereby. In conventional translating devices, the needle is usually inserted in a needle socket and is clamped in place therein by means of a set screw. The manipulation of this set screw frequently causes considerable annoyance to the user. Furthermore, if the user is careless, he is apt to omit tightening the set screw sufficiently to hold the needle securely in place in the needle socket, and the slight vibrations imparted to the needle are not transmitted thereby with proper fidelity in such cases.

The primary object of my present invention is to provide an improved needle holder for clamping the needle to the driven member of a sound box or electrical pickup.

More particularly, it is an object of my present invention to provide an improved needle holder and clamping device by means of which the needle will be rigidly attached to the driven member of the sound box or pickup device.

Another object of my invention is to provide an improved needle holder for apparatus of the type set forth which can be manipulated with great facility to permit quick changing of needles.

A further object of my present invention is to provide an improved needle holder as aforesaid which is simple in construction, economical in cost, and highly efficient in use.

In accordance with my present invention, I provide a needle socket with a V-shaped groove which is adapted to receive a needle, and I place around the socket member a spring member which has a normal diameter smaller than the diameter of the socket member, so that it will tightly hug the socket member and the needle inserted in the groove thereof and thereby hold the needle firmly in place. The spring member may be constituted by a coil spring one end of which is fixed in relation to the socket member and the other end of which has a laterally extending portion which may be grasped by the fingers to effect "unwinding" of the spring and thereby enlarge this diameter so that the needle will be free for insertion into or removal from the groove of the socket member, as the case may be. In another form of my invention, I form the spring of a single piece of flat tempered material which may be formed into a cylindrical body portion. The ends of this spring member are constituted by oppositely disposed tabs which extend substantially tangentially from the body portion thereof to cross each other beyond the body of the spring, and the tabs are thereafter bent back toward each other to extend outwardly in substantially radial relation to the body of the spring. This spring is made rotatable on the socket member and when it is rotated to a position where the crossing portions of the tabs are opposite the groove in the socket member, sufficient room is afforded for the needle to be easily inserted into or removed from the groove of the socket member. Upon turning the spring to another position so that the cylindrical body portion comes opposite the groove in the socket member, the spring will tightly clamp the needle in the groove of the socket member and hold it firmly in place.

The novel features that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation, together with additional objects and advantages thereof, will best be understood from the following description of two embodiments thereof, when read in connection with the accompanying drawing in which

Figure 1 is a side elevation of a sound box employing one modification of my invention,

Figure 2 is an enlarged fragmentary, bottom, plan view thereof,

Figure 3 is an exploded perspective view showing the needle socket and holding spring of this modification of my invention in detail,

Figure 4 is a developed, plan view of the needle-holding spring of this form of my invention,

Figure 5 is a fragmentary view showing another modification of my invention, and

Figure 6 is a sectional view taken on the line VI—VI of Figure 5.

Referring more particularly to the drawing, wherein similar reference characters designate corresponding parts throughout, I have shown, in Figures 1 and 2, a sound box or pickup device 1 having a stylus bar or armature 3, as the case may be, pivotally mounted on bearings 5 in conventional manner and having a cylindrical extension 7 constituting a needle socket. The socket 7 is formed with a V-shaped groove 9 which has a depth slightly less than the diameter of a needle 11 received in the groove 9.

Surrounding the cylindrical socket member 7 is a spring member 13 which has a body portion 15 and a pair of oppositely extending tabs or ends 17 and 19. The spring member 13 is made of tempered material and is rolled up so that the body portion 15 is formed into a cylindrical sleeve having a normal diameter slightly less than the diameter of the socket member 7. Thus, when the spring member 13 is placed on the socket member 7, the spring member tightly hugs the socket member 7 and therefore holds the needle 11 firmly in place in the groove 9.

The tabs 17 and 19 extend from the cylindrical body portion 15 in substantially tangential relation thereto for a short distance and cross each other slightly beyond the body portion, as clearly shown in Figure 3. Thereafter, the tabs or ends 17 and 19 are bent back toward each other to constitute tab extensions which extend substantially radially outwardly and which may be easily grasped by the fingers to effect rotation of the spring member 13 or the socket member 7. When it is desired to either insert the needle 11 in the groove 9 or remove the needle therefrom, the tabs 17 and 19 are grasped by the fingers and the spring member is rotated until the crossing portions of the tabs 17 and 19 are opposite the groove 9. This affords ample room for the needle to be inserted into the groove 9 or to be withdrawn therefrom. If desired, the tabs 17 and 19 may be pressed toward each other to thereby enlarge the diameter of the cylindrical body portion 15 and provide still more clearance for the needle 11. In any case, after a new needle has been inserted into the groove 9, pressure is removed from the tabs 17 and 19 and the spring 13 is moved around until the cylindrical body portion 15 thereof is opposite the groove 9, whereupon the needle 11 becomes firmly gripped in the socket groove 9.

In the modification of my invention shown in Figures 5 and 6, I form the socket member 7 with a helical groove into which is fitted a coil spring 21 one end of which is fixed to the socket member 7 or to any other suitable part of the stylus bar 3, and the opposite end of which is extended to form a lateral extension 23. The normal internal diameter of the coil spring 21 is also smaller than that of the socket member 7, so that the needle 11 will be tightly gripped thereby and held firmly in the groove 9. When it is desired to release the needle, the lateral extension 23 is moved in a direction to "unwind" the coil spring 21, thereby enlarging its diameter and freeing the needle 11 for removal from the socket member 7. When the new needle has been inserted into the groove 9, the lateral extension 23 may be released, whereupon the spring 21 winds itself up again in the aforementioned helical groove and once more hugs the socket member 7 and the needle 11 tightly to retain the needle firmly in place.

While I have shown and described but two embodiments of my invention, it will be apparent to those skilled in the art that many other modifications thereof, as well as changes in those heretofore described, are possible. Accordingly, I desire that my invention shall not be limited except insofar as is made necessary by the prior art and by the spirit of the appended claims.

I claim as my invention:

1. In a sound translating device, a needle holder comprising a socket member provided with a groove for the reception of a needle, said groove having a depth slightly less than the diameter of the needle, and a compressible and expansible member encircling said socket member, said encircling member tending constantly to compress to a diameter smaller than that of said socket member whereby said compressible member firmly hugs said socket member to hold the needle therein.

2. In a sound translating device, a needle holder comprising a socket member provided with a groove for the reception of a needle, said groove having a depth slightly less than the diameter of the needle, and a spring member encircling and normally firmly hugging said socket member to thereby hold the needle therein.

3. In a sound translating device, a needle holder comprising a socket member provided with a V-shaped groove for the reception of a needle, the depth of said groove being slightly less than the diameter of the needle, and a spring member encircling and normally firmly hugging said socket member to thereby hold the needle therein.

4. In a sound translating device, a needle holder comprising a socket member provided with a groove for the reception of a needle, said groove having a depth slightly less than the diameter of the needle, and a coil spring surrounding said socket member, said coil having a normal internal diameter which is slightly smaller than the diameter of said socket whereby said spring constantly tends to wrap itself tightly around said socket member to firmly hold the needle in said groove.

5. The invention set forth in claim 4 characterized in that said socket is provided with a helical groove along its length into which the turns of said spring are fitted.

6. The invention set forth in claim 4 characterized in that said spring has one end thereof fixed in relation to said socket member, the other end thereof extending laterally from said socket member whereby said last-named end may be manipulated to unwind said spring to expand its diameter and thereby free the needle for release from said groove.

7. In a sound translating device, a needle holder comprising a socket member provided with a groove for the reception of a needle, said groove having a depth slightly less than the diameter of the needle, and a spring member surrounding said socket member and having its ends offset laterally with respect to the body thereof and crossing each other, said spring member being arranged to normally tightly hug said socket member whereby to firmly hold the needle in said groove and to be loosened on said socket member upon pressing said ends together whereby to free said needle for release thereof from said socket member.

8. The invention set forth in claim 7 characterized in that the body of said spring is substantially cylindrical in form, and characterized further in that said ends extend from said body a short distance in substantially tangential relation to said body and cross each other thereby beyond, said ends being thereafter bent back toward each other to provide a pair of oppositely disposed tabs which may be pressed together to loosen said spring member on said socket member.

9. In a sound translating device, a needle holder comprising a cylindrical socket member provided with a V-shaped groove for the reception of a needle, said groove having a depth slightly less than the diameter of the needle, a spring member having a cylindrical body portion surrounding said socket member and being rotatable on said socket member, the normal diameter of

said body portion being slightly less than the diameter of said socket member whereby said spring member is adapted to hug said socket member to firmly hold the needle in said groove, and said spring member terminating in end portions which extend substantially tangentially from said body portion and which cross each other therebeyond, the rotation of said spring member on said socket member to bring said crossed end portions opposite said groove affording sufficient room for the needle to be slipped into and out of said groove, and the rotation of said spring member to another position on said socket member causing said spring member to effect a gripping action on the needle within said groove.

FREDERICK L. CREAGER.