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THREAD REMOVAL ATTACHMENT FOR RECORDING MECHANISMS

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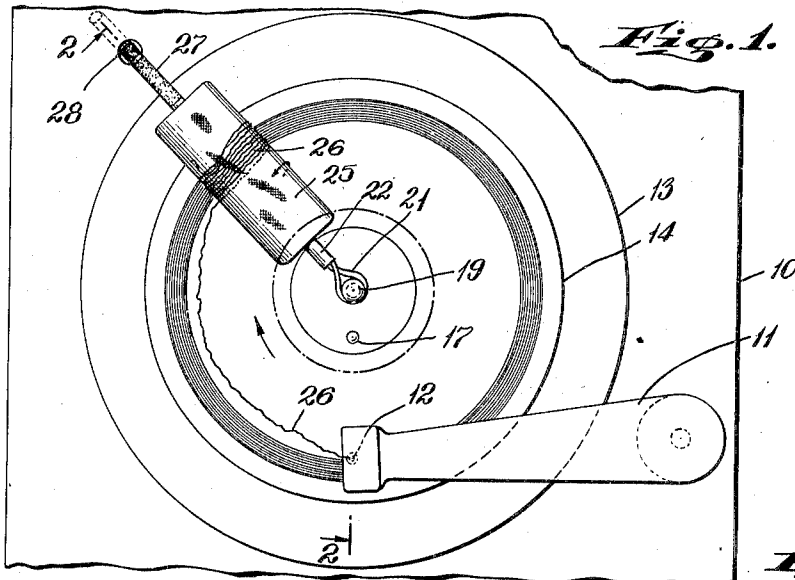


Fig. 1.

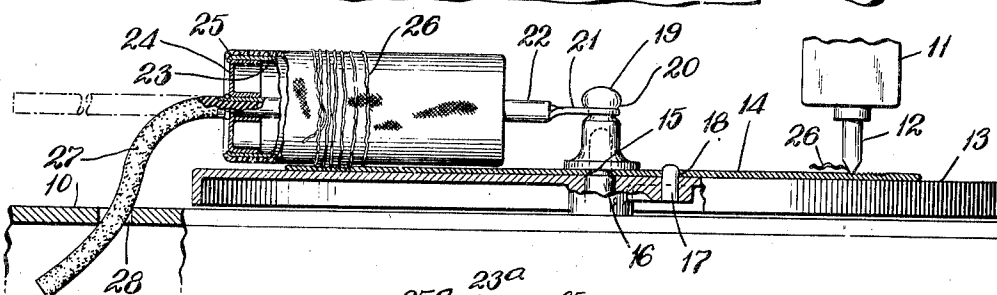


Fig. 2.

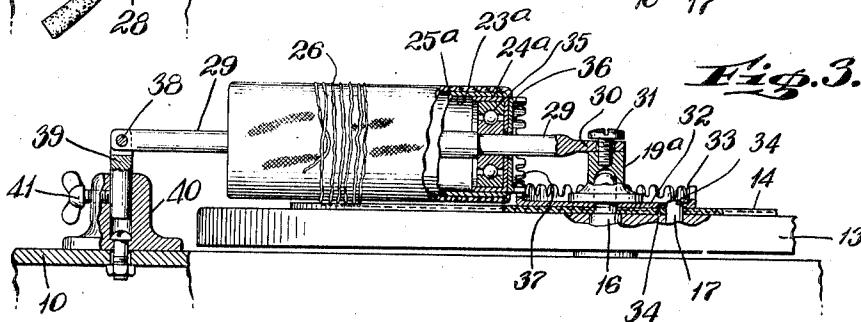


Fig. 3.

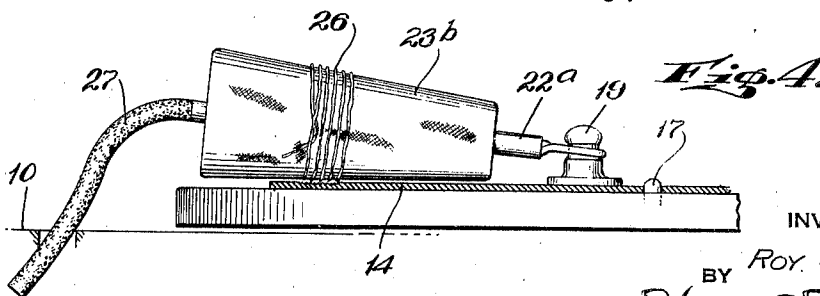


Fig. 4.

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THREAD REMOVAL ATTACHMENT FOR
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13 Claims. (Cl. 274-1)

This invention relates to mechanisms for recording on disc records, radio pick-ups, broadcasts, and the like, of various kinds and classes, and particularly to the provision of an attachment for recording apparatus of this type and kind for the automatic dispensing or removal of the thread cut from the record by the stylus to maintain the record disc free and clear of the thread during the operation of cutting a recording on the record; and the object of the invention is to provide an attachment of the character described in the form of a rotatable cylinder supported over the record in the path of the cut surface thereof to automatically pick up and wind the thread cut from the record upon the cylinder so as to maintain the surface of the record free and clear of the thread, thereby materially increasing the efficiency and accuracy of the recordings on the records; a further object being to provide an attachment of the class described having a fabric facing to which the cut thread will readily adhere, thereby facilitating the automatic pick-up and winding of the thread on the surface of the cylinder; a still further object being to provide a winding attachment of the character described employing positive means for rotating the cylinder independent of frictional engagement with the surface of the record disc, while supporting the cylinder in close proximity to and over the surface of the disc on which recordings are to be formed; and with these and other objects in view, the invention consists in an attachment of the class and for the purpose specified which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a diagrammatic plan view of a part of the recording mechanism showing one form of attachment which I employ.

Fig. 2 is a section substantially on the line 2-2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing a modification; and

Fig. 4 is a view similar to Fig. 2 showing another modification.

In commercial recording of various types and kinds of performances, either in a recording studio or through radio hook-ups, as well as in the making of home recordings, it has been the

custom and practice to either manually dust or brush the hair or thread cuttings from the records, and in some instances, suction machines and the like have been employed for removing these threads for the purpose of providing automatic dispensing of the thread and facilitating automatic operation of the recording mechanism, eliminating the attention of an individual or attendant caring for the manual removal of these threads.

It is the purpose of my invention to provide an automatic pick-up or dispensing attachment to recording mechanisms of the type and kind under consideration, which by reason of its simplicity and economy in construction, can be used not only for commercial purposes, but by the amateur in the home. It is a further purpose to provide an attachment which will automatically pick up and wind the thread upon a receiving drum or cylinder which may be frictionally rotated by engagement with the recording disc or may be positively rotated in any desired manner, thereby saving considerable costs in the making of commercial recordings in eliminating the manual operation and further in dispensing with elaborate mechanisms or apparatus heretofore employed for this purpose.

In Figs. 1 and 2 of the drawing is shown diagrammatically one adaptation of the invention. In said figures, 10 represents a part of a table of a recording mechanism upon which is pivotally arranged the arm 11 carrying at its free end the stylus 12 arranged above the rotatable table 13 upon which is disposed the record disc 14. The disc 14 may be of any desired construction but preferably of the type comprising a metallic core upon which is disposed the usual surfacing materials or compositions as is well known in the art. The disc 14 has a central aperture 15 to receive the center pin 16 of the turn-table 13, and at 17 is arranged a key pin on the table entering another aperture 18 in the disc to provide a positive drive of the record disc 14 in the usual manner. It will of course be understood that various types and kinds of recording mechanisms are employed and the present invention is to be by no means limited to the diagrammatic illustration of recording mechanisms herein shown, as this is simply to illustrate one adaptation of the invention.

In carrying my invention into effect, I mount on the center pin 16 a supplemental pin or cap 19 having a reduced portion 20 to receive a ring or apertured end 21 of a rod 22 which extends radially over the disc 14 and table 13 in spaced relation

to the engagement of the stylus 12 with the surface of the disc 14 substantially in the manner illustrated in Fig. 1. Freely rotatable upon the rod 22 is a rotatable member or cylinder 23 primarily in the form of a tube having bearing caps 24, one of which is shown in section in Fig. 2. The cylinder proper may be composed of cardboard, paper board, or any inexpensive material, particularly so if it is intended to throw away this tube with the thread windings thereon. In cases where the thread windings are otherwise removed, a more permanent structure such as metallic tubing can be employed as at 23.

It is preferred that the outer surface of the rotatable member 23 be coated with a facing 25 of a soft and preferably fuzzy fabric. In some instances felt may be used, but cotton fabrics, velours and the like may also be employed. The purpose of using some sort of a soft or fuzzy fabric is to insure a positive pick-up of the strand or thread 26 which is cut from the surface of the record by the stylus 12 in making a recording thereon.

Considerable static prevails in the thread, and it will thus be apparent that as the cut thread approaches the cylinder, which in the structure shown in Figs. 1 and 2 is rotated by frictional engagement of the surface with the disc, the thread will automatically be picked up by the surface material 25 and wound around the cylinder automatically throughout the operation of the recording mechanism. This thread is usually very fine and more or less hair-like and has a tendency to twist or curl as is diagrammatically illustrated in Fig. 1. The several windings upon the cylinder will of course be irregular depending largely upon the movement of the thread 26 as it is removed from the disc 14.

In order to keep the cylinder from changing its position upon the surface of the record, a flexible and resilient retaining rod 27 is mounted in the free end of the rod or shaft 22 and passes downwardly through an opening 28 formed in the table 10. The rod 27 is preferably composed of a heavy but flexible rubber with sufficient rigidity to maintain the position of the cylinder while at the same time permitting the cylinder to yield vertically as well as laterally.

It will of course be understood that in more elaborate types of devices, especially those intended for commercial uses, suitable bearings and mountings will be provided for the cylinder to reduce friction and to provide free operation.

In Fig. 3 of the drawing is shown one modified form of construction, and in this showing the rotatable table 13, including the disc 14 and the mountings 16 and 17, is the same as that shown in Figs. 1 and 2. In fact, the cylinder is substantially of the same construction but is designated by the light parts 23a, 24a, and 25a.

Substituted for the rod or shaft construction 22 is a rod or shaft 29, one end of which is reduced and apertured as seen at 30 to be arranged upon a cap 19a and retained against displacement therefrom by a screw 31. The cap 19a is arranged upon the pin 16 the same as the cap 19, but disposed below the cap is a drive gear 32 having upstanding circumferential teeth 33. The gear 32 has an aperture 34 to receive the pin 17 in order to positively drive the gear 32 to the rotating table 13.

With the structure shown in Fig. 3, the cylinder has ball bearing mountings on the shaft 29 as indicated at 35, and outwardly of the inner cap 24a of the cylinder is secured, by welding 75

or otherwise, a gear 36 having peripheral teeth 37 adapted to mesh with the teeth 33 of the gear 32, as clearly illustrated in the drawing. With this construction it is preferred that the surface of the cylinder be arranged adjacent but above the upper surface of the disc 14 in that the cylinder is positively rotated through the gears 32, 36 as will be apparent. The outer end of the shaft 29 is pivoted as seen at 38 to a vertically arranged stud 39 adjustably retained in a bearing 40 secured to the table 10 of the machine and retained in different positions of adjustment by a set screw 41.

In Fig. 4 of the drawing is shown a slight modification of the structures shown in Figs. 1 and 2, the only difference being that the cylinder 23b will be made conical in form rather than as shown in Figs. 1 and 2, and is otherwise of the same general construction. The shaft or rod 22a is mounted on the pivot cap or bearing 19 identical to the bearing 19 shown in Figs. 1 and 2, and at 27 is shown the flexible rubber rod mounting also similar to the rod 27 of Figs. 1 and 2. By using the conical formation, the larger diameter of the cylinder near the outer peripheral end of the record disc 14 will compensate for the greater amount of thread which is collected at this section of the record; whereas the smaller inner diameter of the cylinder 23b will care for the thread cut in the recordings at the inner or smaller diameter of the record disc. It will be understood that the conical type of disc may also be employed with a structure such as that illustrated in Fig. 3 of the drawing, or in any other type of positive drive to the cylinder.

It will be understood that many types and kinds of cylinder constructions may be employed; that is to say, those of the cheap economic construction which can be thrown away with the threads wound thereon, or types wherein the thread may be removed from the cylinder and the cylinder reused. In all instances, the cylinder will be disposed over and substantially in a radial position with respect to the record disc so as to readily pick up the threads cut from the surface of the disc in producing a recording thereon. It will also be apparent that the device may be used in conjunction with recording mechanisms for records of any diameter.

It will also be understood that the use of the conical cylinder is also desirable from the standpoint of stripping the thread or strand material therefrom after a complete recording has been performed.

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

1. In a recording apparatus of the class described employing means forming a sound record groove in the surface of a record disc, removing a thread-like strand from the surface of the disc in forming such grooves, a thread pick-up and winding device comprising a shaft, a rotatable member on the shaft, means supporting said shaft to dispose the said member radially over the upper surface of the disc and with the surface of the said member in close proximity to the surface of the disc, said member having on the surface thereof a facing material readily adhering to said cut and removed thread, and means supporting said member for rotation in the rotation of said disc to automatically wind the thread on said member.

2. In a recording apparatus of the class described employing means forming a sound rec-

ord groove in the surface of a record disc, removing a thread-like strand from the surface of the disc in forming such grooves, a thread pick-up and winding device comprising a shaft, a cylinder rotatable on the shaft, means supporting said shaft to dispose the cylinder radially over the upper surface of the disc and with the surface of the cylinder in close proximity to the surface of the disc, said cylinder having on the surface thereof a facing material readily adhering to said cut and removed thread, means supporting the cylinder for rotation in the rotation of said disc to automatically wind the thread on said cylinder, and means supporting the inner end of said shaft upon the axis of revolution of said record disc.

3. In a recording apparatus of the class described employing a rotatable record supporting table and means disposed thereover forming a sound record groove in the surface of a record disc supported on said table, removing a thread-like strand from the surface of the disc in forming such groove, a thread pick-up and winding device comprising a shaft, a member rotatable on the shaft, means supporting said shaft to dispose said member radially over the upper surface of the disc and with the surface of said member in close proximity to the surface of the disc, said member having on the surface thereof a facing material readily adhering to said cut and removed thread, means supporting said member for rotation in the rotation of said disc to automatically wind the thread on said member, and said last named means comprising interengaging drive elements on said member and said table.

4. In a recording apparatus of the class described employing a rotatable record supporting table and means disposed thereover forming a sound record groove in the surface of a record disc supported on said table, removing a thread-like strand from the surface of the disc in forming such groove, a thread pick-up and winding device comprising a shaft, a member rotatable on the shaft, means supporting said shaft to dispose said member radially over the upper surface of the disc and with the surface of said member in close proximity to the surface of the disc, said member having on the surface thereof a facing material readily adhering to said cut and removed thread, means supporting said member for rotation in the rotation of said disc to automatically wind the thread on said member, said last named means comprising interengaging drive elements on said member and said table, and means adjustably supporting said member in spaced relation to the upper surface of said record disc.

5. The combination with a recording mechanism of the class described, employing a rotatable disc supporting table with means arranged over the table for cutting a thread-like strand from the upper surface of a record disc arranged on the table in forming a recording thereon, of a thread removing attachment comprising a shaft arranged over the surface of the disc from the axis to the periphery thereof, a cylinder rotatably mounted on the shaft, means supporting said shaft to dispose the surface of the cylinder in close proximity to the surface of said disc, and means supporting the cylinder for rotation in the rotation of said disc to wind the thread-like strand cut from the record around said cylinder.

6. The combination with a recording mechanism

of the class described, employing a rotatable disc supporting table with means arranged over the table for cutting a thread-like strand from the upper surface of a record disc arranged on the table in forming a recording thereon, of a thread removing attachment comprising a shaft arranged over the surface of the disc intermediate the axis and periphery thereof, a cylinder rotatably mounted on the shaft, means supporting said shaft to dispose the surface of the cylinder in close proximity to the surface of said disc, means supporting the cylinder for rotation in the rotation of said disc to wind the thread-like strand cut from the record around said cylinder, and the surface of said cylinder having a facing of material readily adhering to said strand facilitating automatic pick-up and winding of the strand around said cylinder.

7. The combination with a disc record supporting and operating table employing a central pin axis, of an attachment arranged radially with respect to said axis for picking up and winding thread-like strands cut from a disc in forming a sound record groove in the disc, said attachment comprising a shaft, a thin walled tube, means at the ends of the tube rotatably supporting the same on said shaft, means at one end of the shaft supporting the same upon said pin axis, means supporting the other end of the shaft, the outer surface of said tube having a facing of material readily adhering to said thread, said shaft supports arranging the facing of said tube in close proximity to the surface of the disc arranged on said table, and means for rotating said tube to wind the thread cut from said disc thereon.

8. The combination with a disc record supporting and operating table employing a central pin axis, of an attachment arranged radially with respect to said axis for picking up and winding thread-like strands cut from a disc in forming a sound record groove in the disc, said attachment comprising a shaft, a thin walled tube, means at the ends of the tube rotatably supporting the same on said shaft, means at one end of the shaft supporting the same upon said pin axis, means supporting the other end of the shaft, the outer surface of said tube having a facing of material readily adhering to said thread, said shaft supports arranging the facing of said tube in close proximity to the surface of the disc arranged on said table, means for rotating said tube to wind the thread cut from said disc thereon, and said last named means comprising intermeshing gears one keyed to the table and the other secured to said tube.

9. The combination with a disc record supporting and operating table employing a central pin axis, of an attachment arranged radially with respect to said axis for picking up and winding thread-like strands cut from a disc in forming a sound record groove in the disc, said attachment comprising a shaft, a thin walled tube, means at the ends of the tube rotatably supporting the same on said shaft, means at one end of the shaft supporting the same upon said pin axis, means supporting the other end of the shaft, the outer surface of said tube having a facing of material readily adhering to said thread, said shaft supports arranging the facing of said tube in close proximity to the surface of the disc arranged on said table, means for rotating said tube to wind the thread cut from said disc thereon, said last named means comprising intermeshing gears one keyed to the table and the other secured to

said tube, and means adjustably supporting said shaft.

10. In pick-up and dispensing devices for removing the thread formed in producing a sound record groove in a predetermined surface, said device comprising an elongated tube arranged over and in close proximity to the surface from which the thread is removed, means rotatably supporting the tube to wind the thread on the surface of the tube as the thread is removed from the record surface, and means on the surface of said tube causing said thread to readily adhere thereto facilitating the winding of the thread thereon.

11. In pick-up and dispensing devices for removing the thread formed in producing a sound record groove in a predetermined surface, said device comprising an elongated tube arranged over and in close proximity to the surface from which the thread is removed, means rotatably supporting the tube to wind the thread on the surface of the tube as the thread is removed from the record surface, means on the surface of said tube causing said thread to readily adhere thereto facilitating the winding of the thread thereon, said tube being tapered throughout the length thereof to provide constantly varying diameters throughout the length of said tube.

12. In pick-up and dispensing devices for removing the thread formed in producing a sound record groove in a predetermined surface, said

device comprising an elongated tube arranged over and in close proximity to the surface from which the thread is removed, means rotatably supporting the tube to wind the thread on the surface of the tube as the thread is removed from the record surface, means on the surface of said tube causing said thread to readily adhere thereto facilitating the winding of the thread thereon, and means adjustably supporting the tube with respect to the surface of said record.

13. In recording apparatus of the class described employing means for forming a sound record groove in the surface of a record disc, removing a thread-like strand from the surface of the disc in forming such groove, a thread pick-up and winding device comprising a rotatable member, means supporting said cylinder radially over the upper surface of the disc with the periphery of the disc in close proximity to the surface of the disc, said member having on the surface thereof a facing material readily adhering to said cut and removed thread, means supporting said member for rotation in the rotation of said record disc to automatically wind the thread on said member, and said member having a small diameter at one end and a larger diameter end, and the small diameter at the other end of said member being disposed adjacent the axis of revolution of said disc.

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