

Aug. 16, 1966

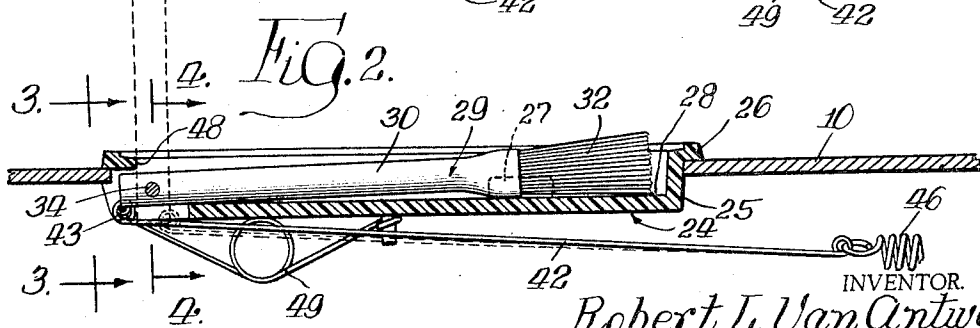
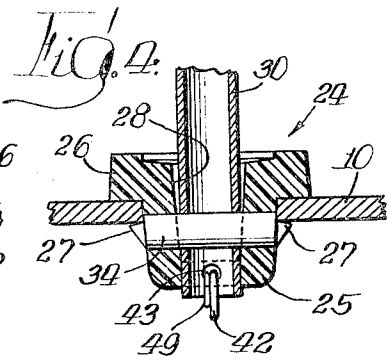
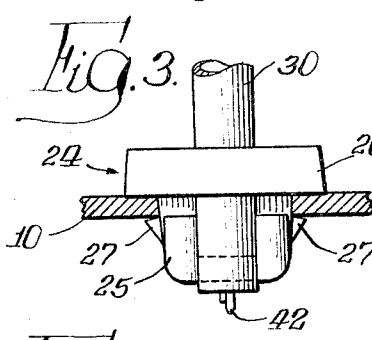
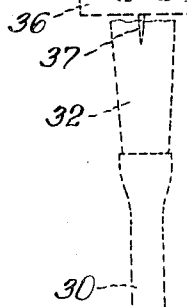
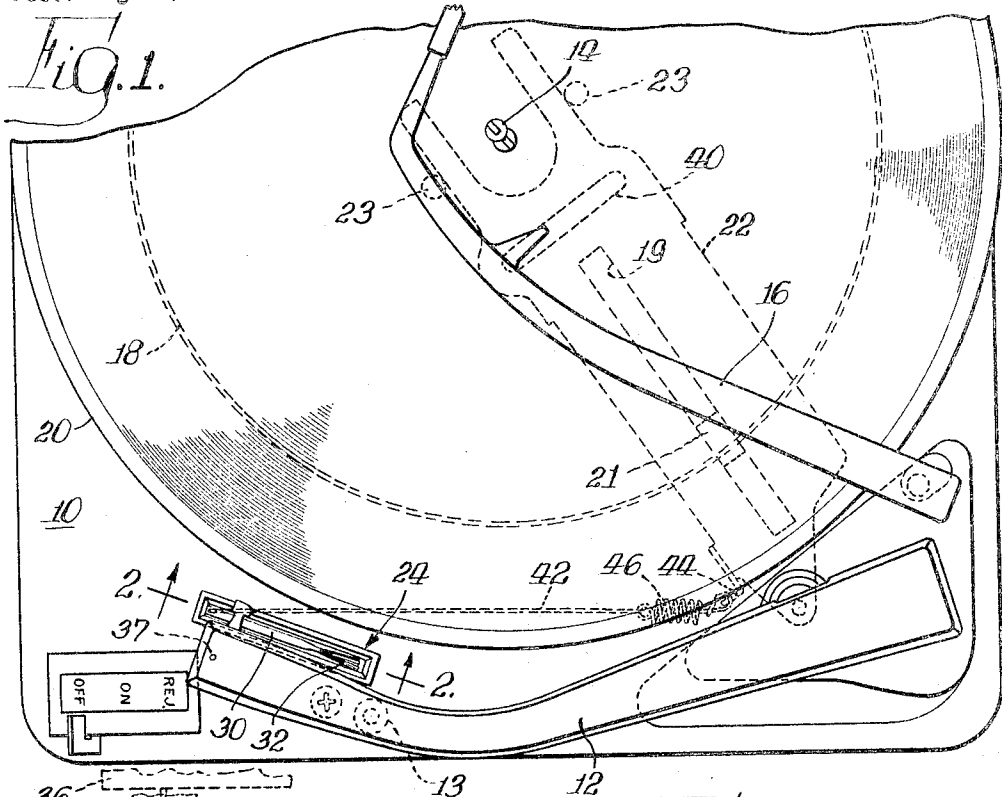
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3,266,807

NEEDLE CLEANING BRUSH FOR RECORD CHANGERS

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2 Sheets-Sheet 1



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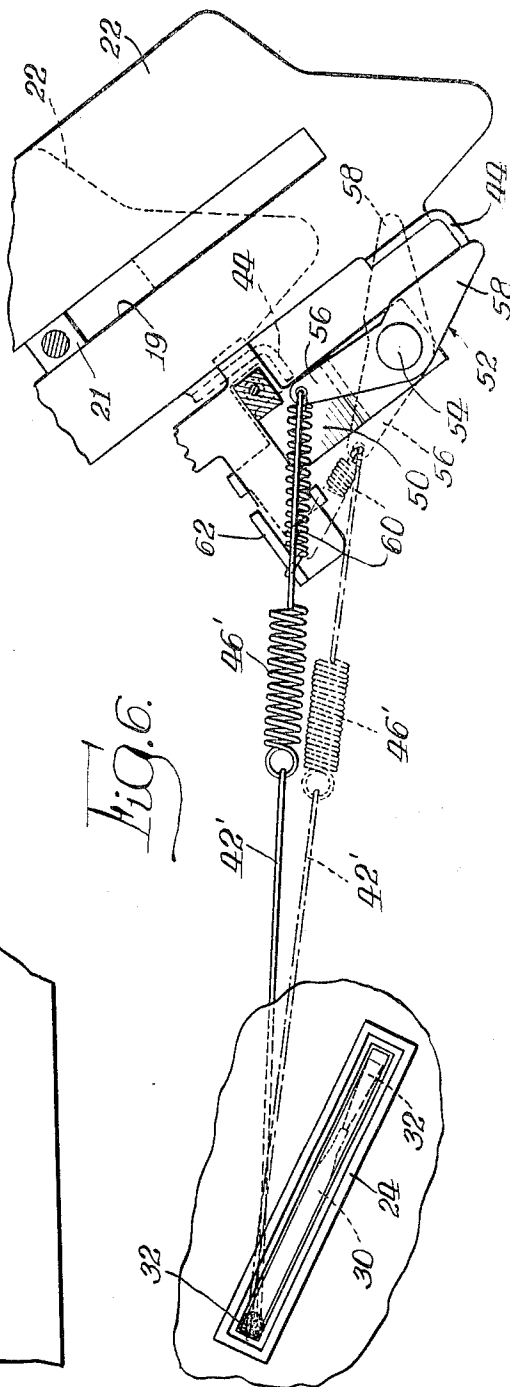
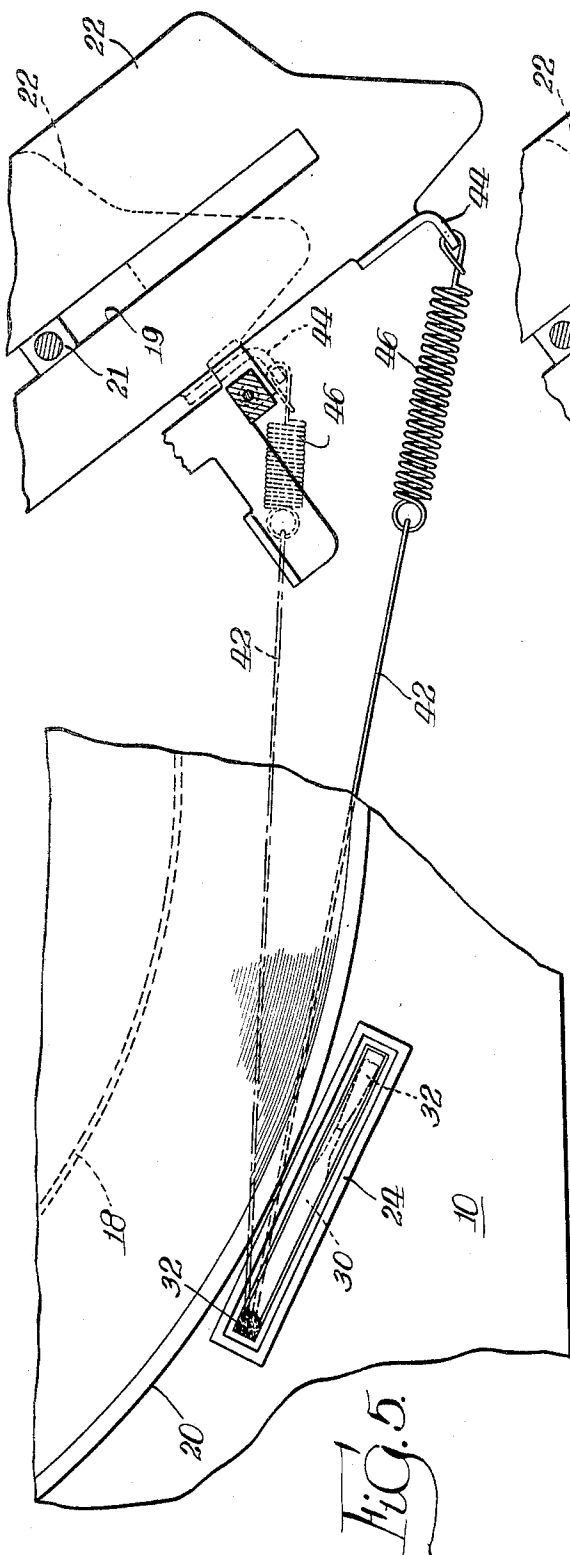
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3,266,807

NEEDLE CLEANING BRUSH FOR RECORD CHANGERS

Filed Aug. 3, 1962

2 Sheets-Sheet 2



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3,266,807

NEEDLE CLEANING BRUSH FOR RECORD CHANGERS

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9 Claims. (Cl. 274-1)

The present invention relates to a needle cleaning brush associated with a record changer and positioned so as to be disposed in the path of the needle when the tone arm moves laterally outwardly and inwardly during a record change cycle.

More specifically, the invention relates to a needle cleaning brush mounted on an arm which is movable vertically relative to an associated record changer baseplate, and to mechanism synchronized with respect to the change cycle of the record changer for moving the brush vertically upwardly to an operative position above the baseplate approximately at the beginning of a change cycle and for retracting the brush to an inoperative position approximately at the end of the change cycle.

The principal object of the present invention is to provide a needle cleaning brush for a record changer which rises during a change cycle to an operative position whereby as the tone arm travels laterally outwardly and inwardly the needle will pass through the brush and be effectively cleaned, the brush being subsequently retracted to an inoperative position until the next change cycle.

Other objects, uses and advantages of the invention will be apparent, or be obvious, from the following specification, particularly when considered in connection with the drawings in which:

FIGURE 1 is a top plan view, partly broken away, showing a record changer embodying the movable needle cleaning brush of the present invention;

FIGURE 2 is an enlarged fragmentary vertical section, taken substantially along the line 2-2 of FIGURE 1, showing the brush in solid lines in its retracted position and in dash lines in its operative position;

FIGURE 3 is an enlarged view taken substantially along the line 3-3 of FIGURE 2;

FIGURE 4 is an enlarged vertical section taken substantially along the line 4-4 of FIGURE 2;

FIGURE 5 is a fragmentary top plan view, with the changer baseplate partly broken away and with various other parts removed for purposes of clarity, illustrating the needle cleaning brush and actuating mechanism therefor of the type shown in FIGURE 1, the actuating mechanism being shown in dash lines in its normal position and in solid lines in the position to which it is moved to elevate the brush; and

FIGURE 6 is a top plan view similar to FIGURE 5 showing an alternative form of mechanism for moving the brush between its operative and inoperative positions.

Referring now to the drawings, FIGURE 1 shows a phonograph record changer comprising a baseplate 10 on which a conventional tone arm 12 is mounted for pivotal movement about vertical and horizontal axes in the usual manner, a rest post for the tone arm being indicated at 13. An offset spindle for mounting a plurality of records to be played is shown at 14, and an arm 16 is provided for stabilizing records supported on the spindle. A turntable is shown schematically at 18, and the outer peripheral edge of a 12 inch record positioned on the turntable is represented at 20.

A slide 22 comprises one element of the mechanism mounted beneath the baseplate for controlling the operation of the record changer. The slide 22 is reciprocated along its longitudinal axis by a gear (not shown) which

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rotates one revolution during each change cycle. A longitudinal slot 19 is formed in the slide 22, and a fixed guide member 21 projects therethrough. In addition, a pair of fixed posts or studs 23 are provided at opposite sides of bifurcated end of the slide to guide the latter during its linear travel.

FIGURES 1-4 show a plastic brush well 24 having a lower portion 25 which projects downwardly through an aperture in the baseplate 10, and an enlarged upper portion 26 which bears against the top of the baseplate. A pair of lateral projections or ears 27 on the well extend outwardly immediately adjacent the underside of the baseplate 10 so as to maintain the well in position on the baseplate. As best shown in FIGURE 2, the well 24 is recessed as at 28 substantially throughout its length so as to accommodate a brush assembly 29. The brush assembly 29 includes an arm 30, which may for example comprise an aluminum tube, and a brush 32 made of soft camel's hair or the like mounted at one end of the arm. The opposite end of the tube or arm 30 is pivotally mounted on a pin 34 which is fixedly secured in the lower portion 25 of the well 24.

FIGURE 2 shows the brush assembly 29 in solid lines in its retracted or inoperative position wherein it is substantially recessed within the well 24, and it shows the brush assembly in dash lines in its operative position wherein it projects upwardly from the baseplate 10 in a substantially vertical fashion so as to dispose the brush 32 in the path of the needle as the tone arm 12 travels laterally outwardly and inwardly during the change cycle. FIGURE 2 includes a schematic representation of a cartridge 36 and a needle 37 to indicate the manner in which the needle will pass through the brush 32 during the change cycle.

The mechanism for actuating the brush assembly 29 during the change cycle will now be described, and it will of course be understood that during the change cycle the tone arm 12 is lifted from a record on the turntable 18 and swung laterally outwardly over the rest post 13 approximately to the position shown in FIGURE 1, after which the next record to be played is dropped to the turntable from the spindle 14 and the tone arm is swung inwardly so as to set down adjacent the outer edge of the record.

The mechanism for dropping records from the spindle 14, and the mechanism for moving the tone arm 12 during the change cycle do not form a part of the present invention, and thus will not be described herein. However, it is an important aspect of the present invention that the brush actuating mechanism is synchronized with respect to the movement of the tone arm during the change cycle, and in the embodiment described herein this is accomplished by actuating the brush assembly 29 from the slide 22.

The slide 22 is reciprocated once during the change cycle, and this may be accomplished in various ways. For example, a pinion (not shown) which rotates with the turntable 18 may be temporarily associated during the change cycle with a gear (not shown) having a stud thereon which is received in a transverse slot 40 (see FIGURE 1) formed in the slide. The gear would be rotated once during the change cycle so as to move the slide along its longitudinal axis, first downwardly and to the right as viewed in FIGURES 1 and 5, and then in the opposite direction so as to complete the change cycle by returning the slide to its original position. FIGURE 5 shows the slide in dash lines in its normal position and in solid lines in the extreme position to which it is moved during the change cycle.

In the embodiment being described, it should be understood that the movement of the slide 22 is utilized to effect the raising and lowering and the lateral travel of

the tone arm 12 during the change cycle. Consequently, it is possible to synchronize the raising and lowering of the brush 32 with the lateral travel of the tone arm by also operating the brush from the slide 22. FIGURE 5 shows one type of mechanism for accomplishing this purpose, namely, a pull link 42 which has one end connected to the end of the brush arm at 43 (which as shown in FIGURE 2 is outwardly of and below the pivot pin 34 when the brush is retracted) and its other end connected to a tab 44 formed on the slide 22. A tension spring 46 is incorporated into the pull link 42 to provide for the necessary yielding therein.

Referring to FIGURES 2 and 5, it will now be understood that when the slide 22 is moved from the position shown in dash lines to the position shown in solid lines, the pull link 42 will be carried with the slide stretching the spring 46 and causing the arm 30 to be pivoted about the pin 34 until it is in its upright position (as shown in dash lines in FIGURE 2) wherein the arm will engage against an end wall 48 of the well 24 which functions as a stop. When the slide 22 returns to its original position, the brush assembly 29 will again be retracted into the well 24. The pull link 42 is sufficiently rigid axially to exert a positive force on the arm 30 to retract the latter when the slide returns to its original position. However, FIGURE 2 shows a compression spring 49 which may be utilized to aid in the retraction of the brush.

With the foregoing arrangement, the brush 32 will be elevated to its operative position approximately at the beginning of a change cycle as the tone arm 12 is lifted from a record on the turntable and begins its outward lateral travel. The brush 32 when in its operative position is disposed in the arcuate path of travel of the needle 37, so that as the tone arm swings outwardly over the rest post 13, the needle will move through the brush 32 and be cleaned. Similarly, after a further record has been dropped to the turntable and the tone arm has moved laterally inwardly to set down on the record, the needle 37 will move through the brush a second time for an additional cleaning operation. The brush will then be retracted to the position shown in solid lines in FIGURE 2.

FIGURE 6 shows an alternative form of mechanism for operating the brush assembly 29 from the slide 22. In this embodiment, a fixed mounting bracket 50 is provided adjacent the path of travel of the slide 22, and a bellcrank lever 52 is pivotally mounted on the bracket by a rivet or the like 54. A pull link 42' including a tension spring 46' has one end secured to the brush arm 30 as described hereinabove, and its other end secured to an arm 56 of the bellcrank. The opposite end of the bellcrank comprises an arm 58 which, when in its normal position as shown in dash lines, is disposed in the path of travel of the tab 44 on the slide 22.

It will now be understood from FIGURE 6 that as the slide 22 moves from the position shown in dash lines to the position shown in solid lines, the tab 44 will engage the bell crank arm 58 and pivot the bell crank to the position shown in solid lines. In this manner, the pull link 42' is actuated to pivot the brush assembly 29 to its upright position. A tension spring 60 connected between the bellcrank arm 56 and a fixed support 62 serves to return the bellcrank to its dotted line position when the slide 22 returns to its original position.

The important aspect of the brush assembly described hereinabove is that the brush 32 rises from a normally retracted position to intercept the needle 37 during the lateran travel of the latter, and that such movement of the brush is synchronized with the movement of the tone arm 12 during the change cycle. If desired, the brush assembly 29 may be raised through linear vertical movement, rather than pivoted as described herein.

While certain preferred forms of my invention have been described and illustrated, it will be appreciated that modifications and changes may be made therein by those

skilled in the art, particularly with my disclosure before them, and thus I do not intend to be limited to the particular disclosure, except insofar as the appended claims are so limited.

I claim:

1. In a record changer having a baseplate, a turntable surmounting the baseplate, means operable during a record change cycle for dropping a record to the turntable, and a tone arm having a cartridge-needle assembly mounted thereon for traversing a record on the turntable to reproduce the same, the improvement comprising a needle cleaning brush movable between a lowered inoperative position and a raised operative position wherein it projects substantially above the baseplate to intercept the needle as the latter travels laterally during a record change cycle, and actuating means operable during the change cycle for moving said brush between its inoperative and operative positions.

2. In a record changer having a baseplate, a turntable surmounting the baseplate, means operable during a record change cycle for dropping a record to the turntable, and a tone arm having a cartridge-needle assembly mounted thereon for traversing a record on the turntable to reproduce the same, the improvement comprising a needle cleaning brush movable between a lowered inoperative position and a raised operative position wherein it projects substantially above the baseplate to intercept the needle as the latter travels laterally during a record change cycle, and actuating means synchronized with the movement of the tone arm during the change cycle for moving said brush between its inoperative and operative positions.

3. The invention of claim 2 wherein the actuating means raises the brush so that it intercepts the needle as the latter travels laterally outwardly during the record change cycle and again as the needle travels laterally inwardly to set down on a record, after which the actuating means lower the brush to its inoperative position.

4. The invention of claim 2 wherein the brush is mounted on the end of an arm which when in its raised operative position projects substantially vertically above the baseplate at a position radially outwardly of the peripheral edge of a record on the turntable and radially inwardly of the outermost position assumed by the needle as the latter travels outwardly during a record change cycle.

5. In a record changer having a baseplate, a turntable surmounting the baseplate, means operable during a record change cycle for dropping a record to the turntable, and a tone arm having a cartridge-needle assembly mounted thereon for traversing a record on the turntable to reproduce the same, the improvement comprising an arm having a needle cleaning brush secured to an end thereof, said arm being pivotally mounted so as to be movable between a substantially vertical position wherein it projects above the baseplate so as to position the brush to intercept the needle as the latter travels laterally during a record change cycle and a retracted substantially horizontal position to lower the brush to an inoperative position, and actuating means operable during the change cycle for pivoting said arm between its horizontal and vertical positions.

6. The invention of claim 5 wherein the actuating means is synchronized with the movement of the tone arm during the change cycle so as to raise the brush to intercept the needle as the latter travels laterally outwardly during the change cycle and again as the needle travels laterally inwardly to set down on a record, after which said actuating means pivots the arm to its substantially horizontal position to lower the brush to its inoperative position.

7. The invention of claim 6 wherein a well is mounted in the record changer base plate and said well is provided with a recessed portion for receiving the pivotally mounted arm and brush when the arm is in its substantially horizontal retracted position.

8. In a record changer having a baseplate, a turntable surmounting the baseplate, means operable during a

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record change cycle for dropping a record to the turntable, a tone arm having a cartridge-needle assembly mounted thereon for traversing a record on the turntable to reproduce the same, and slide means mounted beneath the baseplate which reciprocates once during each change cycle to effect lateral movement of the tone arm, the improvement comprising a needle cleaning brush movable between a lowered inoperative position and a raised operative position wherein it projects substantially above the baseplate to intercept the needle as the latter travels laterally during a record change cycle, and means actuated by said slide means during the change cycle for moving said brush between its inoperative and operative positions.

9. In a record changer having a baseplate, a turntable surmounting the baseplate, means operable during a record change cycle for dropping a record to the turntable, a tone arm having a cartridge-needle assembly mounted thereon for traversing a record on the turntable to reproduce the same, and slide means mounted beneath the baseplate which reciprocates once during each change cycle to effect lateral movement of the tone arm, the improvement comprising an arm having a needle cleaning brush secured to the end thereof, said arm being pivotally mounted so as to be movable between a sub-

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stantially vertical position wherein it projects above the baseplate so as to position the brush to intercept the needle as the latter travels laterally during a change cycle and a retracted substantially horizontal position to lower the brush to an inoperative position, and linkage means connected to one end of said arm and actuatable by said slide means during the change cycle for pivoting said arm between its horizontal and vertical positions.

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