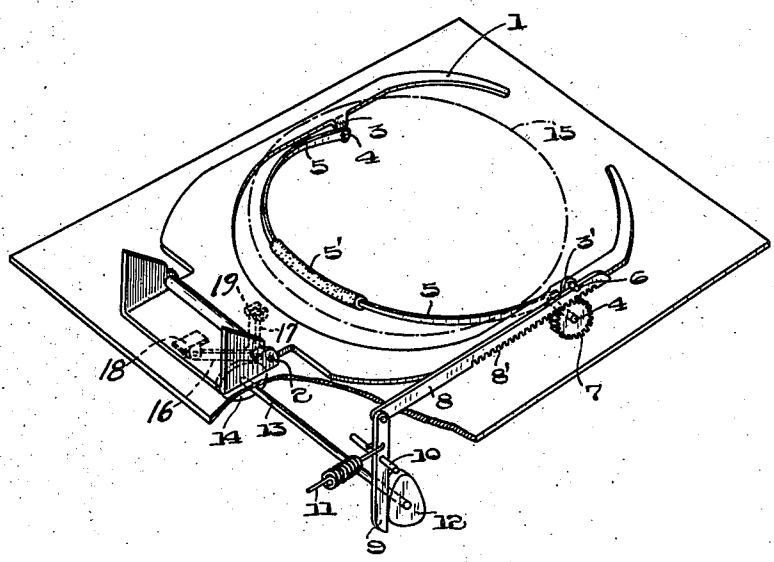
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DEVICE FOR INVERTING RECORD DISKS AUTOMATICALLY

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INVENTOR:
TSURUKICHI TSUCHIYA
BY: Haseltine, Lake & Co.
ATTORNEYS

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DEVICE FOR INVERTING RECORD DISKS AUTOMATICALLY

Tsurukichi Tsuchiya, Shintomi-Cho, Kyobashi-Ku, Tokyo, Japan

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The present invention relates to a device of simple construction for inverting sound record disks automatically on the turntable of a reproducing machine such as a talking machine. One of its objects is to ensure the smooth operation of first removing from the turntable and inverting record disks and then replacing the disks on said turntable without any possibility of damage to said disks. The other objects and the nature and advantages of this invention will appear more fully hereinafter as this specification proceeds.

In accordance with the invention the device comprises a member of approximately U-shape or horse-shoe shape mounted on a stationary axis for pivotal movement between a substantially horizontal position beneath the plane of the turntable and an upwardly inclined position above the turntable and by which the disk is removed from the turntable and supported during inversion, characterized by the provision of a single semi-circular inverting arm pivotally attached at its ends to the side arms of the disk-supporting member and adapted to be swung upwardly in a direction counter to that of said member while the latter is being raised so as to pivot the disk between the side arms of said member.

The invention will become apparent from the following description of a constructional embodiment thereof, reference being had to the accompanying drawing, which shows a perspective view of the device mounted in position on the motorboard of a reproducing apparatus, parts being broken away to better reveal certain detail.

Referring now to the drawing, the numeral 1 designates generally the element by which the disk is removed from and replaced on the turntable and on which it is supported while being inverted. This element consists of a substantially U-shaped or horse-shoe shaped member pivotally mounted at its closed end on a stationary spindle 2 and having its side arms so spaced that during operation the element not only can be swung freely between a substantially horizontal position beneath the plane of the turntable and an inclined position above the turntable but during said operation will engage beneath and lift the disk from the turntable and support it during the inverting operation.

Provided substantially centrally of each of the side arms of the member 1 and in a vertical plane passing approximately through the centre of the turntable is a depending lug or bracket 3 suitably formed integrally with said arms and extending from the inner edges thereof. Also formed integrally with one of the arms of the element 1 and located substantially vertically above the corresponding lug 3 is an upstanding lug 3'. Fitted loosely within an aperture in each of the lugs 3 is a pivot pin 4, the inner end of which is secured to one end of a semi-circular inverting arm 5, said arm thereby being free to turn about the axis 4, 4 relative to the element 1.

Secured to one of the pins 4 is a pinion 7 which meshes with the teeth 8' of a rack formed on the lower edge of a horizontally arranged link 8, the teeth of the rack being maintained in engagement with the pinion by means of a guide pin 6 secured to the lug 3' and against which the upper edge of the link 8 engages. The rear end of the link 8 is pivotally attached to one end of a lever 9 which is pivotally mounted intermediate its ends on a pin 10 suitably secured to a stationary part of the apparatus such as the motorboard. The other end of the lever 9 is maintained in contact with the circumferential face of a cam disk 12, fast on a shaft 13, by means of a tension spring 11, one end of which is attached to the arm and the other end to a stationary part of the apparatus.

As previously mentioned, the member 1 is mounted for pivotal movement on a fixed axis and during operation it is rocked about its pivot firstly in an upward direction to lift the disk from the turntable, when the disk is inverted by the arm 5 as will hereinafter be described, and then lowered to its original position below the plane of the turntable to deposit the disk thereon with the hitherto lower surface uppermost. This movement of the member 1 is controlled by a cam 14 also fast on the shaft 13 and located below the underface of the member 1 and adjacent the pivoted end thereof. Rotation of the shaft 13 and therefore of the cam 14 actuates a link system consisting of links 16 and 17 connected together, link 16 being connected at one end to the motorboard at 18 and link 17 connected at its outer end to the member 1 at 19 which links together operate said member.

Actuation of the member 1 may be effected in any convenient manner by causing rotation of shaft 13 and thus of cam 14 which lifts link 16, raising said member 1, this operation being preferably automatically controlled from the motor driving the turntable through the intermediary of a clutch and lever mechanism (not shown) which connects the motor to the cam shaft 13 when the first side of the disk 15 on the turntable has been played.

The following is an explanation of the manner of operating this invention:

When one side of a disk 15 has been played and the cam shaft 13 coupled to the motor 10 as above described, the cam 14 through the link system 16, 17 causes the member 1 to swing upwardly about the spindle 2 and lift the disk off the turntable, the disk then resting at approximately diametrically opposed points on the side arms of said member. During this tilting movement of the member 1 the inner end of the disk, i. e. the portion of the disk adjacent the spindle 2 on which the member 1 is pivoted, tends to drop between the side arms of said member. At the same time the cam 12 causes the link 8 to move rearwardly (to the right in the drawing) thereby rotating the pinion 7 in a clockwise direction. This causes the arm 5 which, in its normal position lies slightly below the plane of the member 1, to swing upwardly about the pivot pins 4, 4 and engage the inner portion of the disk 15. Concurrently with the continued upward pivotal movement of the member 1 under the action of the cam 14, the inverting arm 5 also continues to swing upwardly under the action of the cam 12, the effect being that while the inner end of the disk is raised more and more by the arm 5, its rear end drops downwardly between the side arms of the member 1, the edge of the disk being supported by the inner edges of said side arms. The disk eventually reaches a vertical position, still being supported by the inner edges of the side arms of the member 1, with a minor portion below and a major portion above said member and thereafter swings over by its own weight, fulcrumming about the points on said arms with which its edge is in contact. The disk continues its free swinging movement until it once again reaches a plane which is parallel to that of the member 1, being thereafter supported on said member until the latter returns to its lower position and deposits the inverted disk on the turntable. It will also be understood that during the return movement of the member 1 to its original position the inverting arm also will return to the position shown in Figure 1 under the action of the cam 12 and the toothed link 8. The inverting arm, as shown in the drawings at 5', may be provided with a rubber covering to prevent the arm damaging the disks.

Having now fully described my invention, I claim:

1. A device for automatically inverting a record disk upon the turntable of a talking machine, comprising a segmental and at least partly annular disk carrying arm disposed partly about the turntable and pivotally mounted upon said machine to swing upon a horizontal axis located exteriorly of a diameter of said turntable, an arcuate inverting bar pivoted at both ends to spaced portions of said arm adjacent to substantially opposite portions of the turntable in lowered position of said arm, and means for raising said arm and also swinging said arcuate bar in an opposite direction to that of the swinging movement of the arm in order to turn a record upon said arm.

2. A device for automatically inverting a record disk upon the turntable of a talking machine, comprising a segmental and at least partly annular disk carrying arm disposed partly about the turntable and pivotally mounted upon said machine to swing upon a horizontal axis located exteriorly of a diameter of said turntable and having a pair of spaced lugs on said arm which in lowered position of said arm are located adjacent to substantially opposite portions of the turntable, an arcuate inverting bar pivoted at one end to one of said lugs and having a shaft fixed to the other end and rotatably mounted in the other of said lugs, means for raising said arm and means for simultaneously swinging said arcuate bar in an opposite direction to that of the swinging movement of the arm in order to turn a record upon said arm.

3. A device for automatically inverting a record disk upon the turntable of a talking machine, comprising a segmental and at least partly annular disk carrying arm disposed partly about the turntable and pivotally mounted upon said machine to swing upon a horizontal axis located exteriorly of a diameter of said turntable and having a pair of spaced lugs on said arm which in lowered position of said arm are located adjacent to substantially opposite portions of the turntable, an arcuate inverting bar pivoted at one end to one of said lugs and having a shaft fixed to the other end and rotatably mounted in the other of said lugs, a pinion fixed on said shaft, a rack meshing with said pinion, projecting means on said arm maintaining said rack in mesh with said pinion in all positions of the arm, means for raising said arm, and means for moving said rack longitudinally in order to swing said arcuate bar in an opposite direction to that of the swinging movement of the arm in order to turn a record upon said arm.

4. A device for automatically inverting a record disk upon the turntable of a talking machine, comprising a segmental and at least partly annular disk carrying arm disposed partly about the turntable and pivotally mounted upon said machine to swing upon a horizontal axis located exteriorly of a diameter of said turntable and having a pair of spaced lugs on said arm which in lowered position of said arm are located adjacent to substantially opposite portions of the turntable, an arcuate inverting bar pivoted at one end to one of said lugs and having a shaft fixed to the other end and rotatably mounted in the other of said lugs, a pinion fixed on said shaft, a rack meshing with said pinion, projecting means on said arm maintaining said rack in mesh with said pinion in all positions of the arm, means for raising said arm, including a driven cam shaft carrying a cam with an eccentric portion transmitting raising movement to the arm, a second cam fixed upon said camshaft, a lever pivotally connected to one end of said rack and being itself swingably mounted in proximity to said second cam so that rotation of the latter with the camshaft and first cam will rock said lever and shift the rack longitudinally and thereby rotate the pinion and ultimately swing said arcuate bar in an opposite direction to that of the swinging movement of the arm in order to turn a record upon said arm, and means including a spring for retaining the lever in contact with said second cam.

5. A device for automatically inverting a sound record disk upon a turntable of a reproducing apparatus, comprising a record disk supporting member having a pair of spaced side arms giving said member an approximately U-shape or horse-shoe shape, said member being mounted for movement about a stationary horizontal axis from a substantially horizontal position beneath the plane of the turntable and an upwardly inclined position above the level of the turntable

in order to remove the record disk from the turntable and support the same during inversion, a single substantially semi-circular inverting arm pivotally attached at its ends to the side arms of the record disc supporting member intermediate the ends of said side arms and the pivotal mounting of said record disk supporting member and adapted to be swung upwardly in a direction counter to that of the supporting member while the latter is being raised so as to pivot the disk between the side arms thereof, and means for raising the supporting member and also swinging said inverting arm.

6. A device according to claim 5, wherein the means for raising the record disk supporting member and also swinging the inverting arm comprise a shaft, a cam on said shaft causing said supporting member to be raised upon rotation of the shaft, a second cam upon said shaft, a pinion fixedly associated with said inverting arm, a movable rack meshing with said pinion, and operative means adapted to be moved by said second cam and communicating its movement to said rack so as to swing said inverting arm in a direction counter to the raising movement of said supporting member.

TSURUKICHI TSUCHIYA.