

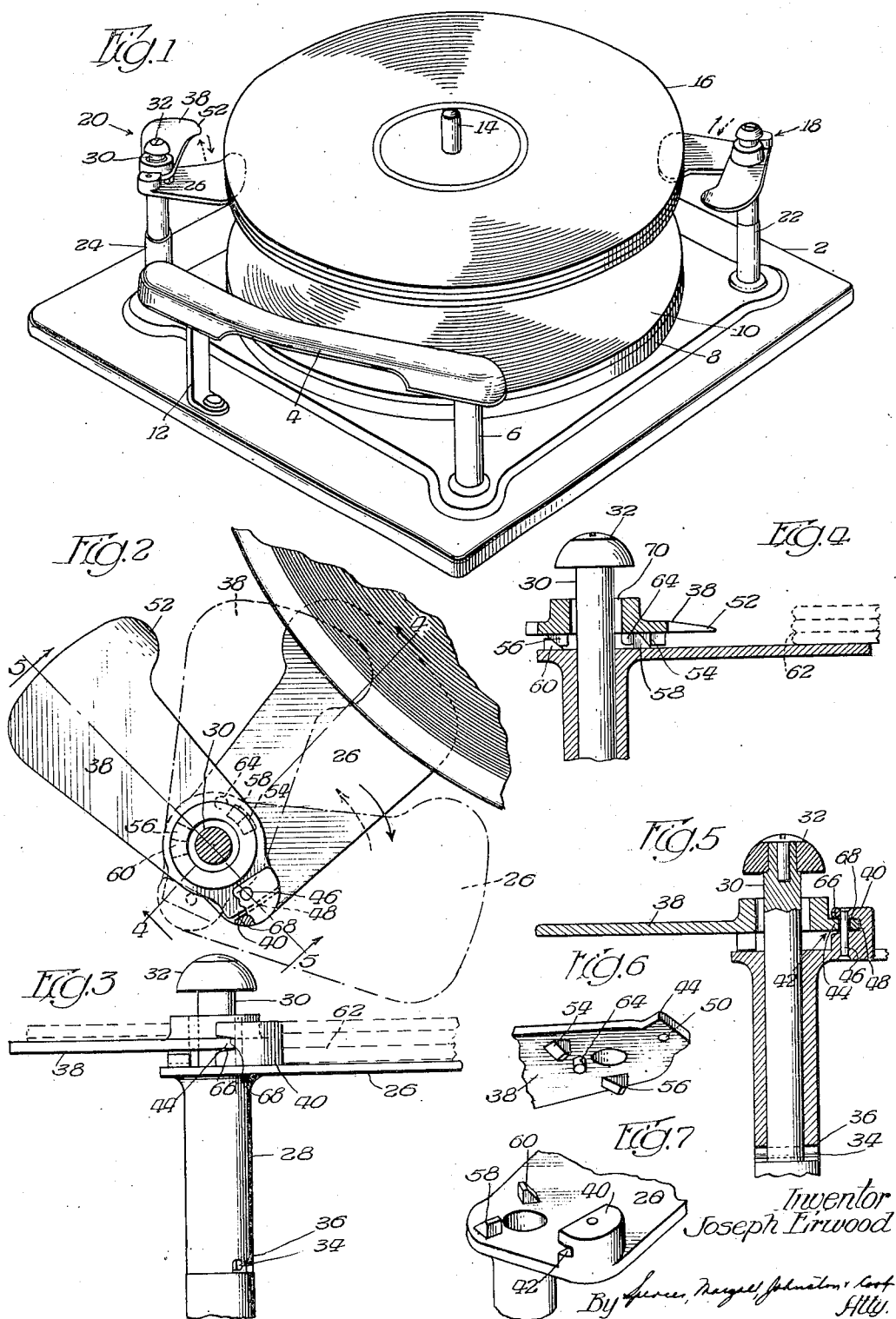
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RECORD CHANGER

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RECORD CHANGER

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4 Claims. (Cl. 274—10)

This invention relates to a phonographic apparatus having an automatic record changer mechanism and is more particularly concerned with the construction and operation of a new and improved type of record changer blade adapted for use in dispensing records one at a time from the bottom of a stack of records superposed above the record playing turntable with a continuation of the turntable spindle passing through the holes in the center of the records.

The present application is a division of my copending application Serial No. 318,301, filed February 10, 1940, now Patent No. 2,230,106, granted January 28, 1941.

The use of the so-called record changer blades to assist in dispensing records from the bottom of a stack of records mounted on the turntable spindle is well known. One of the difficulties heretofore experienced in using record changer blades is caused by the difference in thickness of different sized records; thus, a twelve inch diameter record has a slightly greater vertical cross section or thickness than a ten inch diameter record. For instance, a ten inch record is normally about .080 inch thick, while a twelve inch record may be from .090 to .110 inch thick. Even with records of the same diameter there may be a slight difference in thickness. Furthermore, records sometimes become warped, which causes a further difficulty in properly dispensing them onto the record playing turntable.

One method of compensating for varying thicknesses of different records is to provide different settings for the record changing blades, but this usually means that the operator of the phonograph has to make a separate adjustment of the record changer blades before playing a different sized record, and if he forgets to do this, the record may be broken. Furthermore, even though the separate adjustments are made, a warped record may not be dispensed properly.

One of the objects of the present invention is to provide a new and improved type of record changer blade, or dispensing mechanism for dispensing records onto a record playing turntable one at a time from the bottom of a stack of records superposed on an extension or continuation of the turntable spindle.

A feature with which the present invention is particularly concerned is the provision of a new and improved type of record changer blade which will dispense records of different thicknesses without the necessity for an independent setting of the record changer blades by the operator of the phonograph.

Other objects and advantages of the invention will be apparent by reference to the following description in conjunction with the accompanying drawing, in which:

Figure 1 represents the top of a phonograph containing the new and improved record changer blades of the present invention;

Figure 2 is an enlarged plan view of one pair or set of blades showing the movement of the blades with respect to the record;

Figure 3 is a side view of the pair of record changer blades shown in Figure 2;

Figure 4 is a sectional view taken along the line 4—4 of Figure 2;

Figure 5 is a sectional view taken along the line 5—5 of Figure 2;

Figure 6 is a perspective view with parts broken away of a portion of the upper or separating blade of the record changer blades;

Figure 7 is a perspective view with parts broken away of a portion of the lower or stack supporting record changer blade.

Referring to Figure 1, the portion of a phonographic apparatus illustrated therein comprises a frame 2, a tone arm 4, a post 6 on which the tone arm is mounted, a record turntable 8 on which a record 10 is supported, a support 12 to support the tone arm 4 when the phonograph is not in use, a turntable spindle 14 upon which the turntable is mounted and which extends upwardly through a superposed stack of records 16. The superposed stack of records 16 is supported on opposite sides by two pairs of record changer blades 18 and 20. Each pair of record changer blades is identical, and hence, the detailed description thereof will be given with respect to one pair only.

The pair of record changer blades 18 is mounted on a cylindrical support member 22 which is attached to the frame 2. In the same manner the pair of record changer blades 20 is mounted on another cylindrical support member 24, which is likewise attached to the frame 2. Within each of the support members 22 and 24 is a rotatable shaft that will be described more fully hereinafter and which is connected to any suitable mechanism for oscillating it or causing it to rotate back and forth a predetermined amount. The present invention is not concerned with the particular type of mechanism employed to oscillate or move the record changer blades. The mechanism used may be the same as described in my copending application Serial No. 318,301, or it may be some other type of mechanism.

The specific details of the construction and

operation of the record changer blades will be more clearly shown in Figures 2 to 7, inclusive, and may be described briefly as follows. Referring to Figure 3, it will be seen that the lower or stack supporting blade 26 has an integral sleeve member 28 which surrounds an internal shaft 30, the latter being provided with a screw cap 32. The sleeve portion 28 is keyed to shaft 30 by means of a pin 34 (shown in Figures 3 and 5) associated with a recess or cut 36 in the lower part of sleeve member 28. Thus, any movement or rotation of shaft 30 is imparted to sleeve 28 and in turn to stack supporting blade 26. However, it is possible to disconnect the sleeve 28 merely by raising it. This is necessary in order to remove the records from the playing turntable. Mounted above the lower or stack supporting blade 26 is an upper or separating blade 38. Integral with blade 26 is a pivot support member 40. Pivot support member 40 has a recessed portion 42, as best shown in Figure 5. The upper blade 38 has a projecting portion or end 44 which is adapted to fit within said recessed portion and which is pivoted and at the same time keyed or held in relatively fixed relationship to the lower blade 26 by means of a pin 46. It will be observed that there is a slight space 48 between the projecting end 44 of the blade 38 and the interior of the recess 42 in member 40. Furthermore, the hole 50 (shown in Figure 6) is sufficiently large to form a relatively loose fit and thereby to permit a slight upward and downward movement of the upper blade 38.

It will be apparent that when the lower blade 26 is rotated the upper blade 38 must likewise rotate because of the connection between the lower blade and the upper blade by pin 46. As the rotation progresses, however, if the point 52 of the upper or separating blade 38 encounters any resistance, for example, by striking the edge of the record, the cam elements 54 and 56, which are integral with the bottom of blade 38, will begin to ride up over the cam elements 58 and 60, respectively, which are integral with the lower blade 26. These cam elements are generally wedge-shaped, or sloping, as shown in Figures 6 and 7, and hence, the upper blade 38 will begin to rise slightly around the pin 46 as a pivot. This slight upward movement is sufficient to compensate for the difference in thicknesses of records and causes the point 52 to enter the space between the lower record and the next succeeding record, that is, at point 62. As shown in Figure 4, the junction between the lower record and the next succeeding record is in the same plane as the separating portion 52 of the separating blade 38 but it will be understood in many instances the junction between the records will be in a somewhat higher plane, and it is this difference in height for which the record blades of the present invention compensate. A stop member 64 is provided in order to limit the forward movement of the upper blade 38 with respect to the lower blade 26 by engaging the wedge 58, as shown in Figure 4.

The limit of the backward movement of the upper blade 38 is determined by the wedge-shaped members 54, 56, 58 and 60, and also by the shape of the upper part 66 of the opening or recess 42. The upward movement of the blade 38 is also limited by the clearance between the upper part 70 of the recess 42 and the upper part of the projecting end 44 of the blade 38, as shown in Figure 5. It will be observed that the recess 42 is generally converging, being larger or wider at its outer end than at its inner end. Thus, at point

68 the clearance or fit of projecting member 44 in recess 42 is relatively close, thereby preventing substantial tilting or lateral seesaw movement of the blade 38. It will be understood that in some cases a tilting or seesaw movement may be permitted, but ordinarily it is preferable that the separating blade 38 does not possess such movement. According to the preferred embodiment shown in the drawing, the separating blade 38 will move backwards simultaneously, concurrently or contemporaneously with its upward movement if it strikes the edge of a record at a point other than the junction between two records. In other words, the path of movement of the separating blade 38 is preferably oblique to the horizontal in an upward direction. It will be understood, however, that the construction and arrangement of the sloped elements 54, 56, 58 and 60 may be varied in order to change the path of movement. Furthermore, other means may be used in order to obtain the slight upward movement. The construction and operation may be such that the separating blade 38 rises substantially vertically. It will be observed that there is a substantial space or clearance 70 (Figure 4) between the separating blade 38 and the axis of rotation 30, this clearance being necessary in order to permit the separating blade 38 to pivot upward around the pivot 46. The cap 32 may be removed at any time simply by unscrewing it thereby permitting the removal of the record changer blades from the shaft or axis of rotation 30. Cap 32 also permits each pair of record changer blades to be raised so that the recess 36 rides on top of the keying element 34 whereby each pair of record changer blades may be swung around in order to permit the removal of a stack of records from a playing turntable 8 in the manner previously described.

The manner in which each pair of record changer blades rotates around its own axis of rotation 30 is illustrated in Figure 2. As shown in Figure 1, the normal position of the record changer blades prior to a record changing operation is with the lower or stack supporting blade 26 beneath the bottom of the stack and the upper or separating blade 38 to the side. The blade assembly 20 is in reversed position with respect to the blade assembly 18 of Figure 1. With this arrangement, both the blade assembly 18 and the blade assembly 20 rotate around their respective axes in a clockwise direction. The extent of this rotation may vary. However, it must continue long enough for the lower or stack supporting blade 26 to clear the bottom record of the stack and for the upper or separating blade 38 to penetrate the junction 62 (Fig. 4) between the lowermost record and the next succeeding record prior to the time that the lower blade 26 clears the bottom record. This is shown by the dotted line position of the changer blades in Figure 2. Just prior to the time that the lower blade 26 clears the bottom record of the stack, the upper blade 38 will be supporting the stack from a point beneath the next to the last record at the bottom of the stack. Thus, as soon as the lower blade 26 clears the stack in the manner shown in Figure 2, the lower record will drop and slide down the turntable spindle 14 onto the turntable 8, assuming the position of the record 10, as shown in Figure 1. The remainder of the records in the stack cannot drop because they are being supported by blade 38. As soon as the record has dropped, or as soon as the lower blade 26 has cleared the stack and permitted the lowermost record to drop, the blades

may be rotated in an opposite direction, as shown by the dotted arrows in Figures 1 and 2, until they again reach the normal position shown in Figure 1 and shown in full lines in Figure 2.

The particular arrangement herein illustrated comprises two sets of record changer blades, but it will be understood that the invention may be carried out with only one set of record changer blades, or with three or more sets. The size and shape of the blades may vary rather widely. The method of rotating the blades around their axes of rotation may also vary. The blades may contain adjusting screws and other devices such as described in my copending application Serial No. 318,301. Other variations may be made without departing from the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In an apparatus of the character described, a pair of record changing blades operatively associated to support a stack of records and to separate said records from the bottom of the stack one at a time, said pair of blades including a lower supporting blade and an upper separating blade rotatable in relatively fixed relationship around an axis of rotation and being maintained in said relatively fixed relationship by an operating member back of said axis of rotation fixed to said lower blade and loosely engaging said upper blade, said upper blade being loosely mounted around said axis of rotation to allow it to tilt with respect thereto and with respect to said loosely engaging operating member.

2. In an apparatus of the character described, a pair of record changing blades operatively associated to support a stack of records and to separate said records from the bottom of the stack one at a time, including a lower supporting blade and an upper separating blade rotatable in relatively fixed relationship around an axis of rotation, said upper blade being loosely mounted around said axis of rotation to permit a slight tilting movement with respect thereto and being pivoted for a slight tilting movement on a pivot back of the axis of rotation with respect to the

separating portion of the blade, said upper blade and said lower blade each comprising a sloped element engageable with each other in such a way that said upper blade is raised gradually a predetermined amount during the rotation of both blades around said axis of rotation when it comes in contact with the edge of a record.

3. In an apparatus of the character described, a pair of record changing blades operatively associated to support a stack of records and to separate said records from the bottom of the stack one at a time, said pair of blades including a lower supporting blade and an upper separating blade rotatable together around an axis of rotation, said lower blade comprising an integral upwardly projecting member back of said axis of rotation with a recess therein, said recess containing a substantially vertical pivot member and said upper blade comprising a projecting portion fitting within said recess, said projecting portion being pivoted loosely on said substantially vertical pivot with sufficient clearance to permit a slight tilting movement of the separating portion of said upper blade with respect to said substantially vertical pivot.

4. In an apparatus of the character described, a pair of record changing blades operatively associated to support a stack of records and to separate said records from the bottom of the stack one at a time, said pair of blades including a lower supporting blade and an upper separating blade rotatable together around an axis of rotation, said lower blade comprising an integral upwardly projecting member back of said axis of rotation with a recess therein and a substantially vertical pivot in said recess, and said upper blade comprising a projecting portion fitting within said recess, said projecting portion being mounted loosely on said substantially vertically pivot with sufficient clearance to permit a slight tilting movement of the separating portion of said upper blade with respect to said pivot, and said recess being shaped for engagement with said projecting portion to prevent substantial tilting from side to side of said blade.

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