

[54] 45 RPM ADAPTER

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[56]

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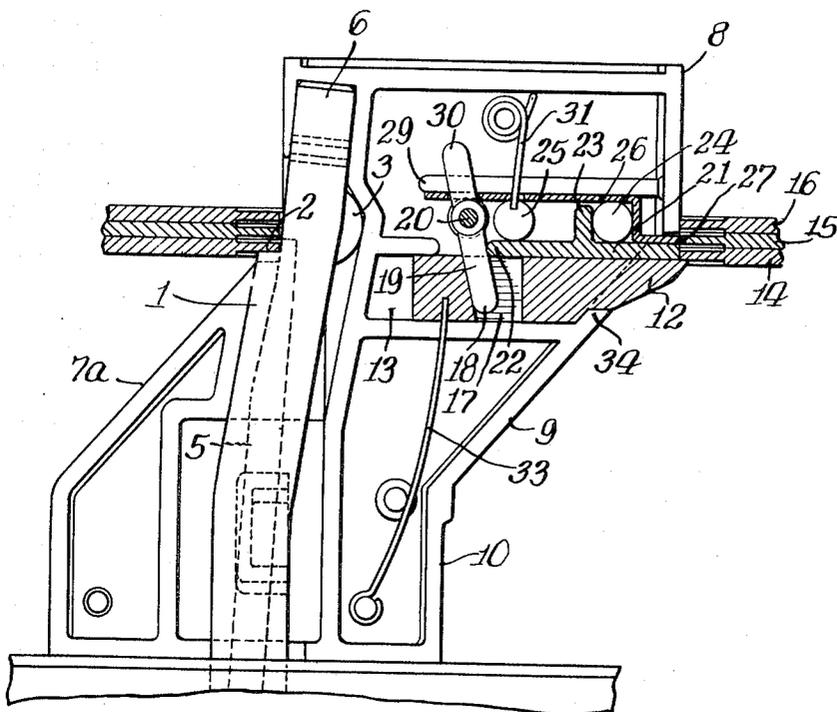
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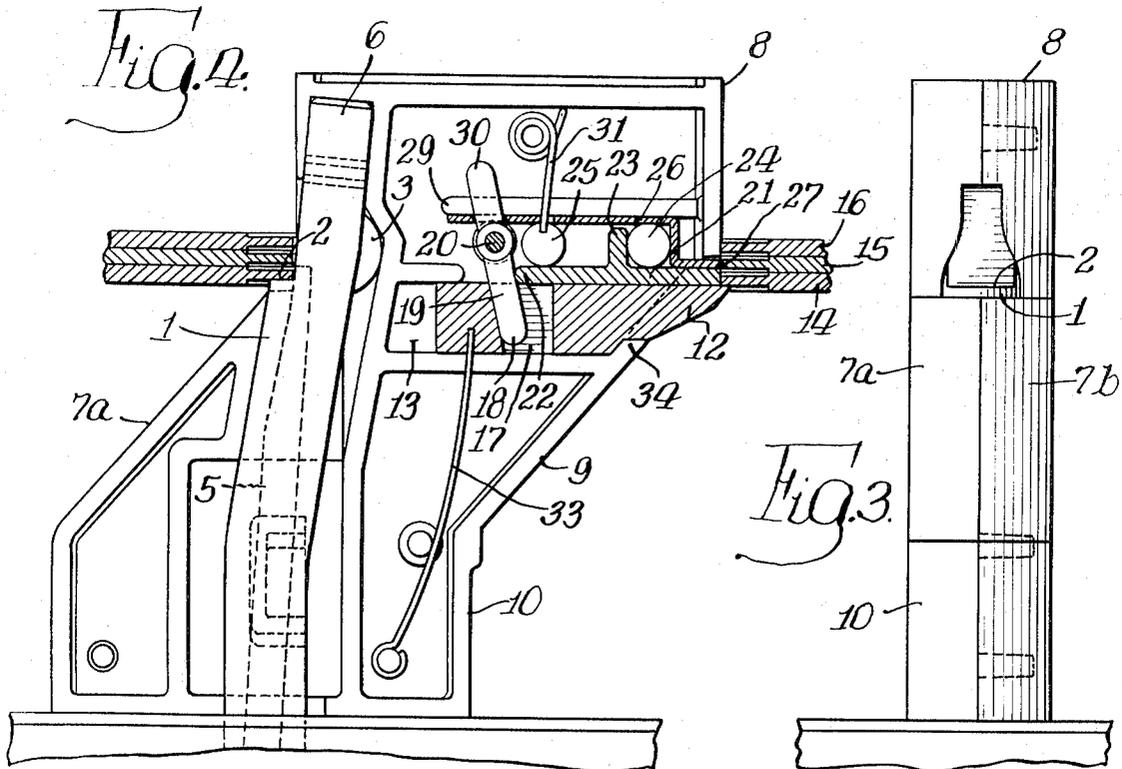
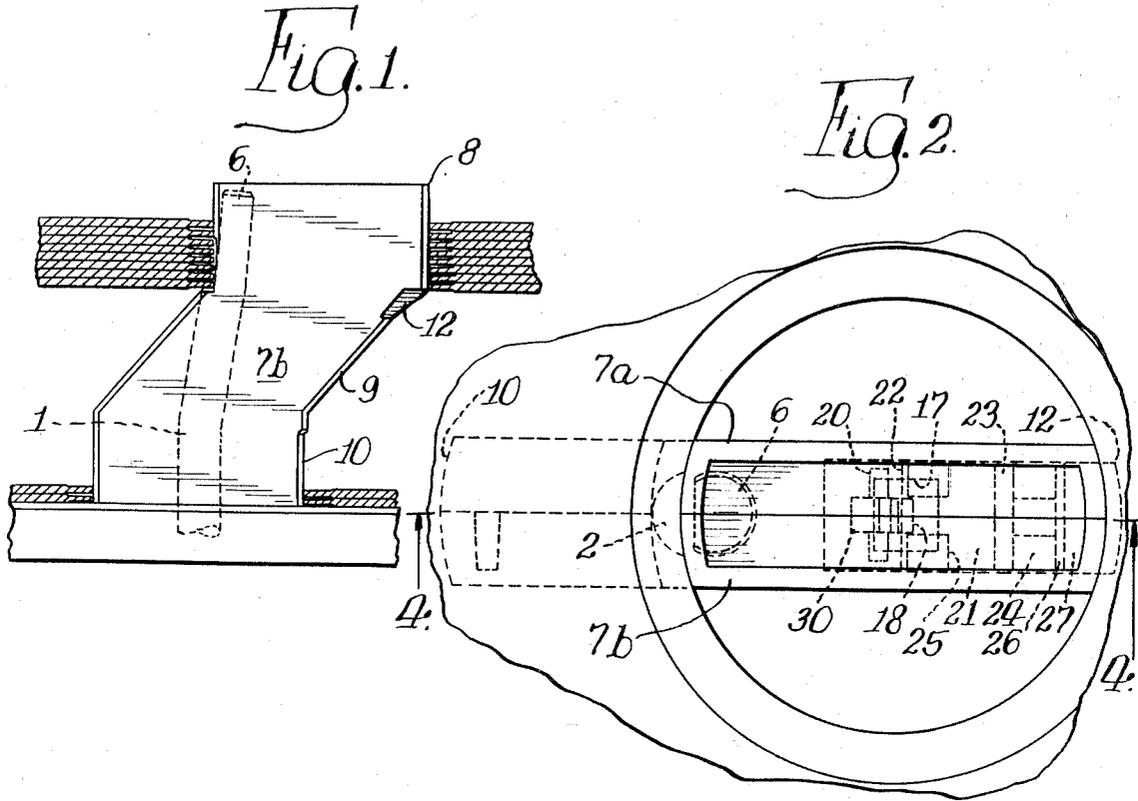
ABSTRACT

The present invention provides a 45 rpm record stacking and dispensing adapter for stacking 45 rpm records and feeding them by operation of a 78 rpm spindle, the adapter being readily applied by slipping it over the top of the 78 rpm spindle down to a position to reveal the shoulder of the 78 rpm spindle. The adapter contains a horizontally disposed sliding bolt

which normally projects from the rear of the adapter—that is, from the side opposite the location of the 78 rpm pushoff lever. When the pushoff lever is automatically actuated in the normal record dropping stage of the record player-changer cycle, the upper end of the spindle lever engages the interior wall of the hole of the lowermost 45 rpm record and pushes it towards and off the edge of the shoulder on the spindle. The bodily horizontal movement of the record, operating as a mechanical link, pulls against the short arm of a second class lever pivoted at its upper end in the adapter and having its lower end, which represents the long arm of the second class lever, engaging the retractable sliding bolt to pull it from beneath the adjacent edge of the lowermost record of the stack; thereby the 45 rpm record is pushed off the edge of the spindle shoulder and at the same time is used as an operating link to withdraw the bolt from beneath the rear edge of the lowermost record. The second class lever which is operated by the movement of the record being pushed off of the spindle shoulder permits withdrawal movement of the bolt in releasing the rear edge of the record itself. Thereby the record is released at the two diametrical points where it was supported at the bottom of the stack. The invention provides an adapter for a 78 rpm record player to permit the stacking and automatic playing of 45 rpm records without alteration other than the application of the present adapter to the standard or any preferred record player.

12 Claims, 4 Drawing Figures





## 45 RPM ADAPTER

## BACKGROUND OF THE INVENTION

The use of adapters for permitting the playing of 45 rpm records upon players constructed primarily for playing 78 rpm records has been before the art for some time.

The 45 rpm records are thinner, of smaller diameter, and have a larger center hole (1.504 inch) than the 78 rpm records and present a different cross-sectional configuration. It is an aim of the present invention to provide a better combination of economical manufacture and dependable operation than that presented by the prior art.

## FIELD OF THE INVENTION

The concept of the shouldered spindle as a storage space for one or more 45 rpm records to be automatically dropped and played is altogether unattractive. Likewise, the difficulty of supporting a disc having the high ratio of diameter of the central hole to the thickness of the disc has complicated the problem.

The novel structure and mode of operation of the present invention provides a simple dependable combination of parts which is capable of economical production.

## SUMMARY OF THE INVENTION

By the introduction of the concept of a balanced support of the stack and the introduction of the principle of utilizing the played disc as a mechanical link reaching from one side of the supporting body to the other side for the simultaneous release of the disc at the ends of a diameter extending through the supporting body, for the simultaneous release of the disc at both ends of the diameter or other balanced supporting means simultaneously releasable, the problem is solved in a simple and inexpensive manner.

## OBJECTS OF THE INVENTION

The primary object of the invention is to provide a simple effective adapter for supplementing the 78 rpm spindle and to provide means to support the stack of records at a plurality of spaced points and about the periphery which provide stable support, and to provide mechanism which will simultaneously withdraw said supporting means at each of said points whereby to allow the record to lower by gravity freely along a suitably guided path onto the turntable.

A further object is to provide support for the stack of records on the remote side when the near side is supported upon the step or shoulder of the spindle until such time as the supporting means on the spindle side of the stack has been withdrawn.

A further object is to utilize the lowermost record as a link between the spindle lever and means to release the balancing support means that supplements the spindle shoulder.

A further object is to provide a simple effective adapter for 45 rpm records which may be easily applied to and removed from a standard feeder spindle.

## DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the preferred embodiment of my invention;

FIG. 2 is a top plan view of the adapter of FIG. 1;

FIG. 3 is a front elevational view showing the spindle step and actuator lever as viewed from the left of FIG. 1; and

FIG. 4 is a vertical section taken on the line 4—4 of FIG. 2 and drawn on an enlarged scale.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in FIG. 2 the adapter of my invention is a unitary assembly adapted to be applied manually to the top of the spindle, and which is similarly removable therefrom. The body of the adapter is formed of two matching plastic shells constructed preferably of medium impact polystyrene. The two similar halves are fastened together preferably by internal pins and sockets providing substantial strength against separation of the parts.

Referring to FIG. 4 the adapter is designed to receive the upper end of a 78 rpm spindle 1 which has a pushoff lever or similar means for dislodging the lowermost record of the stack from the shoulder 2 of the spindle 1. The spindle here indicated may be of the type disclosed in the copending application of Anthony D. Szpak, Ser. No. 171,863, filed Aug. 16, 1971. The said spindle 1 utilizes an elastic roller 3; said elastic roller may be utilized to register the adapter with a groove in the bore of the spindle receiving recess.

A spindle lever 5 is mounted and adapted to cooperate with the lowermost record on the shoulder 2 to shove the record towards the left in FIG. 4. The diagonal guiding portion 9 of the adapter merges into the lowermost vertical guiding portion 10 above the turntable, which portion 10 delivers the dropped record substantially concentrically on the axis of the turntable in playing position.

The bolt 12 which projects from the side of the adapter remote from the shoulder 2 on the spindle is guided in a guideway 13 horizontally disposed and lying diametrically opposite the shoulder 2. The bolt 12 is preferably rectangular in cross-section so as to be guided in the rectangular guideway 13 and to present its flat upper surface on its outer end, as shown at the right of FIG. 4, in a position to engage the margin of the lowermost record 14 of the stack shown in FIG. 4. The bolt 12 has a recess 17 opening upwardly to receive with clearance the lower arm 18 of the lever 19 which lever 19 is pivoted on a horizontal axis 20 lying a short distance above the top of the bolt 12. When the lever arm 19 is swung to the left as viewed in FIG. 4, the bolt 12 is withdrawn from the edge of the lowermost record 14 to allow it to drop by gravity. In so dropping it tends to pivot about its engagement with the upper end of the spindle or of the pushoff lever 5.

Immediately above the upper face of the bolt 12 is the pusher 21 which has a horizontal sliding surface lying flat on top of the bolt 12 and having its inner end 22 engaging the arm 18 of the lever 19. The plunger 21 has an upwardly projecting stop portion 23 adapted to have its movement limited between the stops 24 and 25. A record stack holder member 26 has its lower offset portion 27 disposed on and guided by the top of the pusher 21 and having its outer end directly in line horizontally with the next to the lowest record 15. The main body of the record holder 26 is guided horizontally between the web portion 29 and the stop members 24, 25 for horizontal motion, limited in the inward direction by the outer stop 24. The record holder 26 has

an aperture through which extends the upper arm 30 of the lever 19. The engagement between the lever arm 30 and the record stack holder 26 is at a relatively short radius from the axis 20 of the lever 19. A biasing spring 31 passing through a hole in the record stack holder 26 is tensioned to engage and urge the record stack holder 26 in a direction to the left as viewed in FIG. 4 to withdraw the end 27 of said record holder to insure clearance for the record stack to drop to shelf of bolt 12.

The bolt 12 normally projects from the casing of the adapter being urged to the right, as shown in FIG. 4, by the tensioned spring 33 the upper end of which engages in a socket in the bolt 12 and tends to slide the bolt 12 to the right as viewed in FIG. 4. The bolt is normally held against the stop 34 which defines its position when it is required to support the margin of the lowermost record 14.

The operation of the device is as follows.

With the two parts 7a and 7b of the adapter housing suitably fastened together, the housing which is formed of a somewhat flexible polystyrene compound may be readily forced over the top of the record playing spindle 1 into a position where the shoulder 2 of the spindle is revealed and where the top of the bolt 12 is on a line with the shoulder 2. This may be insured by a shoulder which engages the upper end 6 of the spindle as shown in FIG. 4. With the parts of the adapter in the position shown in FIG. 4, 45 rpm records may be threaded over the casing 8, for example three records 14, 15 and 16 as shown in FIG. 4, and thereupon they will rest upon the spindle shoulder 2 at the left, and upon the upper surface of the projecting nose of the bolt 12 at the right. This provides stable support for the records. Obviously the plurality of supporting members may be increased or varied.

The angular position of the housing or casing 8, relative to the shoulder 2 of the spindle, may be observed visually and the configuration of the receiving opening for the upper end of the spindle may be shaped to conform so as to be readily applied by the operator. For variations in detail of the spindle shoulder and pushoff member, the adapter may be conformed within the claims below written.

Upon cycling of the player through the point of swinging the spindle lever 5 through the motion of discharging the lowermost record from the shoulder 2, it will be observed from FIG. 4 that to move the lowermost record 14 to the left in FIG. 4 to the extent of clearing the shoulder of the spindle 1 the plunger 21 must be pushed to the left by swinging the lever 19 in a clockwise direction against the tension of the spring 33. The plunger 21 which normally is held in the position shown in FIG. 4 where its outer end is clear of the vertical wall of the casing 8 is pushed to the left, as viewed in FIG. 4, swinging the arm 18 of the lever 19 in a clockwise direction to the extent of withdrawing the end of the bolt 12 from beneath the margin of the lowermost record 14 to allow this side of the record to drop by gravity.

At the same time that the bolt 12 is being withdrawn by a motion of the plunger 21, the lever 19 overcomes the action of the spring 33. The arm 30 being moved against the spring 31 by clockwise motion pushes against the record stack holder 26 which is thrust into the space or opening which exists between the bottom record 14 and the next to the bottom record—namely, record 15—and holds the superposed part of the stack

against dropping. Thus the bolt 12 and the record stack holder 26 act as an escapement for the lowermost record 14.

It will be observed that the motion of the spindle lever in shoving the bottom record off the shoulder 2 is necessarily small. The arrangement of leverage between the plunger 21 and the bolt 12 is such that the movement of the plunger 21, which is of the same extent as that of the pushoff lever, is at a much shorter radius than is the bolt 12, whereby removal of the bolt 12 from the support of the bottom record 14 preferably coincides with or precedes the discharge of the lowermost record 14 from the shoulder 2 to insure that the release will not be hung up at either end. In the arrangement shown in FIG. 4 the bolt 12 has a less obstructed release than that of the shoulder 2.

The released record then follows the diagonal path of the intermediate portion 9 of the adapter down to the concentric portion 10 and the record thus lowered is deposited concentrically with the spindle 1 on the turntable.

A unique feature is the utilization of the lowermost record as an operating link of the mechanism for withdrawing the support from the record at two diametrically opposite points.

I do not intend to be limited to the specific details shown or described as they may obviously be varied by those skilled in the art within the ambit of the appended claims which define my invention.

I claim:

1. In a record stack holder and dispenser the combination of a spindle (1) having a horizontal shoulder (2) for engaging the margin of a record (14) to be supported, a spindle lever for moving said record edgewise off the shoulder, an adapter casing (8) embracing said spindle and exposing said shoulder, said casing being adapted to be embraced by one or more records (14, 15, 16) to be supported and dispensed, a bolt (12) mounted in the casing on the opposite side of the casing from the spindle shoulder, said bolt having a horizontally disposed record supporting surface facing upwardly, said bolt being movable horizontally to be projected out of the casing to provide support for the margin of a record (14), or retracted inside the casing to withdraw support from a record engaging the same, a plunger (21) disposed in the casing above the bolt (12) and means (19) connecting the plunger (21) and the bolt (12) whereby the movement of a record (14) edgewise off the spindle shoulder (2) transmits motion to the plunger inwardly of the casing to withdraw the bolt (12) from under the engaged margin of said record (14).

2. The combination of claim 1 with a record engaging holder (26) disposed in the casing and being guided horizontally in register with the next to the lowermost record (15) of the stack to engage the margin of said last named record whereby to support the same against dropping.

3. In combination an adapter for stacking and feeding 45 rpm records by means of a 78 rpm spindle (1) having a horizontal shoulder (2) and a pushoff lever (5), said adapter comprising a casing including a record holding portion (8) eccentric of and embracing the upper end (16) of said spindle and exposing said shoulder (2) to be engaged by records to be supported, said adapter also comprising a guiding portion (9) for guiding each of the eccentrically supported records, when

they are released, to a position concentric of the spindle, said adapter comprising a sliding bolt (12) guided horizontally in said casing and having an end portion adapted to be projected out of the casing to support the adjacent hole edge of the lowermost record (14) which is also supported by said spindle shoulder (2), spring means (33) tending to project the end portion of said bolt (12) beyond the edge of the record holder portion (8) of the casing, a horizontally guided plunger (21) having a record engaging end substantially in the plane of the lowermost record (14) on the aforesaid shoulder and being movable horizontally by edgewise pressure of the lowermost record (14) when it is shoved off the shoulder (2) of the spindle, and means (19) actuated by the plunger for withdrawing the end portion of the bolt (12) from its supporting position under the hole edge of the record.

4. The combination of claim 3 with a movable record stack holding means (26) disposed in the plane of the next to the lowermost record in the stack, and actuating means (30, 31) operable upon inward movement of the plunger (12) for pressing the record stack holding means to engage the margin of the next to the lowermost record (15) in the stack while the lowermost record (14) is being shoved off the spindle shoulder.

5. In combination with claim 3 of a record stacking holding means (26) from the casing (8) on the side opposite the spindle shoulder, a stop for positioning the stack holding means (26), a spring (31) for seating the end of the stack holding means against said stop to provide clearance for the lowest record (14) in the stack, and means (31) released by movement of the plunger (21) inwardly of the casing to thrust the stack holder means into the edge of said next to the lowermost record on the casing.

6. The combination of claim 3 wherein the plunger (21) is connected to the bolt (12) through a lower (19) having a short arm connected to the plunger and a longer arm connected to the bolt, whereby the travel of the bolt is greater than the travel of the plunger when the plunger is moved inwardly of the casing.

7. The combination of claim 3 wherein the bolt (12) and the record stack holder (27) are connected to opposite ends of a first class lever (18, 30), and independent springs (33, 31) are connected to the bolt and to the record holder acting in unison with each other.

8. The combination of claim 3 wherein the spring means (33) acting on the bolt (12) tends to project it out of the casing in conjunction with the spring (31) acting on the record stack holder (26) whereby upon release of pressure of the lowermost record (15) on the plunger (21) the bolt (12) is projected out of the casing and the record stack holder (26) is withdrawn into the casing.

9. The combination of an adapter casing (8, 9, 10) embracing the upper end of a shouldered record holding and dropping spindle (1) having a pushoff lever (5),

a horizontally guided and movable bolt (12) adapted to be projected from the back of the casing opposite the location of the shoulder (2), a slidable plunger (21) in the casing, said plunger being of substantially the vertical thickness of the records to be dropped and lying substantially in the plane of the lowermost record (14) on the shoulder (2), spring means (33) tending to project the bolt out of the casing, stop means (23, 24) for limiting the throw of the spring, said plunger (21) being movable by edgewise movement of the lowermost record (14) from the shouldered spindle (2) for actuating said bolt (12), and motion multiplying means (18, 20, 22) connecting the bolt (12) and the plunger (21) for withdrawing the bolt (12) by inward motion of the plunger (21) to release the lowermost record.

10. An adapter for use with a record player spindle (6) having a record supporting, substantially horizontal, shoulder (2) and a pushoff member (5) for pushing a record (14) edgewise off the shoulder, an adapter casing (8) having a spindle engaging portion adapted to expose said spindle shoulder (2) for supporting the margin of a record placed on said shoulder and embracing said casing, a movable detent member (12) carried by said casing (8) and having a retractable shoulder for supporting the lowermost record on said spindle at a point substantially opposite said spindle shoulder (2) and means (21, 19, 12) operable by the pushoff member and acting through edgewise movement of said lowermost record for actuating said detent member (12) to withdraw the retractable shoulder from beneath the lowermost record embracing said casing.

11. An adapter providing for the playing of a stack of 45 rpm records upon a phonograph designed for playing 78 rpm records which comprises an adapter (8) having a socket for receiving a spindle (1) with a record holding shoulder (2) and a pushoff lever (5) at said shoulder (2), said casing comprising a magazine portion having means for holding a stack of 45 rpm records with the margin of the central hole of the lowermost record resting in part upon said shoulder (2), a bolt (12) normally retractably projecting from the side of the magazine portion remote from said shoulder (2) and normally underlying the margin of the central hole of the lowermost record (14) of the stack, and means (21, 19, 12) actuated by edgewise movement of said lowermost record off of the spindle shoulder (2) by said pushoff lever (5) for retracting the bolt (12) from under the margin of said lowermost record (14) to release said record for descent to a playing position.

12. The adapter of claim 11 with a record stack holder (26, 27) for engaging the record (15) of the stack immediately above the lowermost record (14) when said bolt (12) is withdrawn from beneath the margin of the center hole of the lowermost record (14) of the stack.

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