Description

The invention relates to a disc-record player comprising a housing, a chassis supported in said housing, a turntable rotatably mounted on said chassis, the axis of rotation of said turntable defining an axial direction; a disc reading means displaceably mounted on said chassis, a loading mechanism for loading a disc onto said turntable comprising: a disc holder for holding said disc prior to loading, said disc holder having a cylindrical wall defining a disc-receiving space, a frame for receiving said disc holder said frame being axially movable relative to said chassis between an upper position, corresponding to said disc not being loaded on said turntable and a lower position corresponding to said disc being loaded on said turntable, a pressure member which is axially movable relative to said chassis for pressing the disc against said turntable and control means for controlling the axial movements of said frame and said pressure member relative to said chassis.

Such a disc-record player is known from US-A-4.272.794 and is intended for use with a disc-holder, which comprises a closed holder-housing. Inside the holder-housing the disc is supported by a hub and clamped thereto by a clamping ring. During the last stage of the loading the hub is centred to the turntable. If during loading the housing of such a player is subjected to shocks or vibrations, the pre-centred position of the disc inside the holder-housing relative to the hub may be disturbed. Consequently, as it is transferred to the turntable the disc may therefore be shifted off-centre to such an extent that ultimately the disc occupies an incorrect position on the turntable and the disc is not played correctly.

Especially disc-record player constructed for playing high density optically readable disc-records, such as those of the "Compact-Disc" type, require an accurate centring of the disc relative to the turntable axis during the loading operation. It is an advantage for such optical disc players to enclose the disc in a protective disc holder, for example of the kind as disclosed in US-A-4.272.794, for protecting the information bearing surface of the disc. If enclosed in such a holder a problem can exist to hold the disc such that the information bearing surface do not contact the holder walls.

It is known from US-A-4.278.258 to enclose a disc in protective holder between an upper and a lower protective plate and to play the disc in its holder on the turntable of a record player. To ensure that the information bearing surfaces of the disc do not contact the protective plates, the disc comprises tapering annular portions at the periphery. The protective plates are engaged and secured to the holder by claws, which are movable in radial directions by release means. During loading, after displacing the claws by release means of a disc-record player the protective plates are moved in axial direction, enabling the disc to freely rotate between the plates.

It is known from US-A-3.959.823 to load a disc into a record player by means of a storage cartridge which contains a tray mounted disc. The tray retains the disc by means of a hub which nests within a bore in the tray. In the player the disc retaining tray is automatically unlocked from the cartridge housing and the tray is brought into an operating position. Finally the turntable is raised, urging against the hub to as to free the disc from the tray. The tray does not comprise any means for preventing contact with the information bearing surfaces of the disc.

It is the object of the invention to provide a disc-record player of the specified type with a loading mechanism comprising a disc holder holding the disc such that the disc is immune to shocks and vibrations during loading and such that the information bearing surface of the disc is spaced from the inside surfaces of the holder.

To this end the invention is characterized in that the disc-receiving space of said disc holder is completely open toward the upper side of said disc holder, said disc holder having latching means comprising a plurality of latching elements arranged adjacent said cylindrical wall to axially latch said disc, said disc holder having a supporting surface adjacent each latching element for axially supporting said disc on one side and said disc holder having an opening formed in a lower side, said opening being arranged such that said turntable extends there through when said frame is in said lower position, release means being axially upwardly directed relative to said chassis, cooperating with said latching means for its radially displacement as said disc is moved onto the turntable, following which said disc is released from said latching means, and cleared from said disc holder and urged against said turntable by said pressure member.

In this way a disc-record player is obtained in which the latching elements keep the disc correctly pre-centred on the holder until the last stage of loading, the pressure member urging the disc against the turntable when it has been released from the disc holder The downward movement of the holder towards and past the turntable enables the latching means to be released by the release means. Thus the loading mechanism can be constructed comparatively simply dispite the presence of the latching and release means. The opening in the lower side of the holder enables the passage of the turntable and the read head of the player, permitting the disc to rotate freely on the turntable. Also due to the open upper side of the disc-receiving space after loading the holder can be moved to a position at least partly below the level of the turntable. This enables to decrease the vertical dimension of the player-housing.

Inside the holder the disc contacts the supporting surfaces of the holder only with portions which are outside the vulnerable information carrying surface. Thus the disc surface is not scratched by contacting surfaces of the holder. A further advantage of latching the disc in the

removable holder is that the use need not touch the disc but only has to grip the holder, the position of the holder being immaterial because the latching elements ensure that the disc cannot drop out of the holder. Thus, the information-carrying surface of the relevant disc is not touched, which is very important in optical discs, in particular those of the "Compact Disc" type, where such contact must be avoided in view of the adverse effect which fingerprints may have on the information-carrying surface during the playing of the disc. Moreover, the user can readily store the holder in a storage case intended for receiving one holder or a plurality of such holders.

The high degree of shock and vibration resistance and the easy and reliable exchangeability of the discs by means of the disc-holder render the disc-record player in accordance with the invention particularly suitable for use in vehicles.

A preferred embodiment of a disc-record player in accordance with the invention is characterized by comprising holding means for holding at least said frame in a fixed position with respect to said housing while said frame is in said upper position for receiving a disc holder through an aperture in said housing. The holding means ensure that in the loading position the frame occupies a stable position in the housing, which position cannot be disturbed by shocks on the housing. Thus a disc holder can be inserted easily through the aperture.

Another preferred embodiment of the invention is characterized in that said release means comprises pins, which in cooperation with walls of said disc holder centre the disc holder relative to the turntable and lock the disc holder after release of the disc from said latching elements, one pin being situated near the front of the housing. Thus, as it is lowered towards the turntable, the disc holder is effectively pre-centred by the pins just before the disc is deposited on the turntable, so that after the release the disc occupies a correctly centred position.

The invention further relates to a disc holder intended for use in combination with such a disc-record player.

In this respect an embodiment of a disc holder in accordance with the invention is characterized in that comprising apertures in the cylindrical wall and in said supporting surface to enable the displacement of a latching element. Thus, when released the disc can readily leave the disc holder, without this movement being impeded by the latching elements.

Still another embodiment of a disc holder in accordance with the invention is characterized in that the disc holder comprises a bottom wall at the side which faces the turntable, which bottom wall adjoins the supporting surface adjacent a latching element and extends across the bottom of a front part of the space bounded by the cylindrical wall. When "Compact Disc" records are used which carry information only on the side facing the turntable, the bottom wall provides an effective protection against fingerprints for the information-carrying surface of the disc. Preferably the bottom wall is located near a grip portion of the holder.

An embodiment of the invention will now be described in more detail, by way of example, with reference to the drawings. In the drawings:

Fig. 1 is an exploded perspective view, partly cut-away, view of a disc-record player in accordance with the invention, a carriage which carries the transfer means being shown removed from the housing for the sake of clarity;

Fig. 2 is a schematic side view of the disc-record player shown in Fig. 1, the carriage being shown in a forward position in the housing;

Fig. 3 is a schematic side view illustrating the first stage of the rearward movement of the carriage;

Fig. 4 is a schematic side view showing the carriage at the end of the second stage of its rearward movement;

Fig. 5 is a plan view of the disc holder;

Fig. 6 is a bottom view of the disc holder;

Fig. 7 is a sectional view of part of the holder taken on the line VII-VII in Fig. 5 and drawn to an enlarged scale.

The disc-record player shown in Fig. 1 comprises a housing 1 in which a chassis 26 is supported on rubber pads 2 for damping vibrations and/or shocks to which the housing is subjected. The housing 1 comprises a front wall 3 in which a front opening 4 is formed. As is also shown in Fig. 2, a disc holder forming part of transfer means 5 can be inserted through the front opening 4. Adjacent grip portions 7a and 7b of the disc holder 6 project from the housing 1 in the position shown in Fig. 2. In this position the front of a frame 8 which also forms part of the transfer means 5 is situated near the back of the front wall 3, so that the disc holder 6 can readily be slid in the direction indicated by the arrow 10 through a loading slot 9 at the front of the frame 8.

Viewed in the sliding direction the frame 8 comprises two parallel side members 11 and 12 of U-shaped cross-section which extend in the direction of the arrow 10 and which each carry a pair of pins 13. At their front ends the side members 11 and 12 are interconnected by a transverse member 14, preferably at both the lower side and the upper side. The distance between the upper and lower walls of the frame members 11 and 12 and the arrangement of these members relative to each other is such that they serve as guides for the insertion of the disc holder 6 into the frame 8 and also support the holder in the frame 8. The pins 13 on the frame members 11 and 12 engage slidably in inclined grooves 16 in the inner sides of two parallel side walls 17 and 18 of a carriage 19 which is movable in the direction of the arrow 10 between forward and rearward positions in the housing 1. The side walls 17 and 18 extend in the direction of movement of the carriage and are rigidly interconnected at their front ends.

In the housing 1 fixed rails 20 and 21 are

arranged on the chassis 26, one at each side of the carriage 19. The rails extend in the direction of the arrow 10 and guide the carriage 19. For a smooth movement of the carriage, balls 22a mounted in elongate carriers 22 are arranged between the side walls 17, 18 and the rails 20, 21 respectively. On the outer side of the side wall 17 is a toothed rack 23 which extends in the direction of the arrow 10 and which cooperates with a toothed pinion 24 in the movement of the carriage 19. The pinion 24 may be connected to a motor (not shown) for automatically moving the carriage between its forward and rearward positions. In the case of electrical drive of the carriage by a motor the disc holder 6 actuates a switch (not shown) when the end of the insertion movement of the disc holder into the frame 8 is reached. The switch starts the motor, which then moves the carriage 19 from the forward position shown in Fig. 2 to the rearward position shown in Fig. 4. In a manner to be described hereinafter, during part of this movement of the carriage 19 the transfer means 5 move downwards towards the turntable to the position shown in Fig. 4. Another switch (not shown) stops the motor drive at the end of the rearward movement of the carriage 19. A push button 25 on the front wall 3 starts the return movement of the carriage 19 from the rearward position shown in Fig. 4 to the forward position shown in Fig. 2. A further switch (not shown) terminates the return movement of the carriage.

On the chassis 26 a turntable 27 is rotatably mounted. Beneath the chassis 26 the turntable is connected to a drive motor (not shown). The turntable has a raised rim 27b which is concentric with the axis of rotation 27a of the turntable and which supports the record disc during operation of the player. The turntable has a centring cone 27c on the upper side. The chassis 26 further supports an optical read head 28 which is movable radially with respect to the axis of rotation 27a. During rotation of a record disc 29 on the turntable 27 the read head 28 optically reads information carried on the lower surface of the disc. In the present embodiment of the player according to the invention, this disc is an optical audio disc of the "Compact Disc" type. During operation the read head 28 is moved in a radially outward direction in a slot 30 in the chassis 26.

The carriage 19 and the transfer means 5 form part of a loading mechanism for loading a disc onto the turntable 27. The loading mechanism also comprises a beam-like pressure arm 31 which carries an annular pressure member 32 for pressing the disc against the turntable, the pressure member having a certain freedom of axial movement between the arm 31 and a plate 33 fixed on the upper side of the arm. The pressure member 32 is made at least partly of a magnetic material. The pressure arm 31 has end portions 31a and 31b which are guided in bifurcated guides 34 rigidly connected to the chassis 26, so that the arm 31 is movable in upward and downward directions at least substantially parallel to the axis of the turntable 27. The end portions 31a and 31b each carry two pins 35a and 35b which are spaced from one another in the direction of movement of the carriage 19 and which extend perpendicularly to this direction, the pin 35a being slightly longer than the pin 35b. In the position of the carriage 19 shown in Fig. 2 the pins 35a and 35b bear on straight guides 17a and 18a formed by the upper edges of the side walls 17 and 18 respectively of the carriage. Near the front of the carriage the straight guides 17a and 18a terminate at the open upper ends of inclined grooves 36 which are formed one in each of the side walls 17 and 18 immediately adjacent raised portions 17b and 18b on the upper edges of the side walls 17 and 18 respectively. At the end of a first stage of the rearward movement of the carriage 19 the raised portions 17a and 17b cooperate with the forward pins 35a on the pressure arm 31 to cause these pins to enter the grooves 36 and the rearward pins 35b to enter two further inclined grooves 37 formed one in each of the side walls 17 and 18 of the carriage 19. During a second stage of the rearward movement of the carriage the pins 35a and 35b slide down the grooves 36 and 37, as shown in Fig. 3. During the first stage of the rearward movement of the carriage 19 the pins 35a and 35b bear on the guides 17a and 17b to support the pressure arm 31 in an upper position above the turntable. Also, during this first stage of the rearward movement of the carriage the transfer means 5, which comprise the frame 8 and the disc holder 6 and which follow the horizontal movement of the carriage 19 during this stage, is kept at a constant upper level by two upright supports 39 which are fixed on the chassis 26 and which have horizontal surfaces 39a at their upper ends on which two bars 38 fixed beneath the side members 11 and 12 of the frame 8 slide during the first stage of the rearward movement of the carriage 19. The rear ends 38b of the bars 38 are flush with the rear ends 8a of the side member 11 and 12 of the frame 8, while the front ends 38a of the bars 38 are located a short distance behind the front ends of the side members of the frame 8. Fig. 1 shows the left-hand bar 38, viewed from the front of the player. Each of the supports 39 also has an upright abutment surface 39b which adjoins the horizontal surface 39a of the support and preferably extends substantially parallel to the axis of the turntable 27 and up which the front end 38a of the respective bar 38 slides, in a manner to be described hereinafter, during a first stage of the forward movement of the carriage 19.

On the chassis 26 two fixed stops 40 are arranged which have abutment surfaces 40a which, like the abutment surfaces 39b, also extend substantially parallel to the axis of the turntable 27. At the end of the first stage of the rearward movement of the carriage 19, the rear ends 8a of the side members of the frame 8 and the rear ends 38b of the bars 38 abut the surfaces 40a and during the second stage of the rearward movement of the carriage, as the frame 8 is lowered vertically towards the turntable 27, the rear ends

of the frame members 11 and 12 and the bars 38 slide down the abutment surfaces 40a. The distance between the abutment surfaces 39 and 40a is at least substantially equal to the distance between the rear ends 38b and the front ends 38a of the bars 38, so that the frame 8 can move without hindrance in the vertical direction between the abutment surfaces 39b and 40a.

Owing to the presence of the guides 34 the pressure arm 31 moves in a direction substantially parallel to the axis of the turntable as the pins 35a and 35b slide in the grooves 36 and 37.

As shown in Figs. 5 and 6, the disc holder 6 is substantially rectangular, the rear wall 41 having slightly bevelled corners in order to facilitate insertion of the holder into the frame 8. If desired, the corners may be bevelled to a greater extent than that shown. As can be seen in Fig. 5 the holder 6 has a circular opening 42 which is completely open at the upper side of the holder and into which a record disc can be inserted. In order to facilitate insertion of the disc into the holder tne upper part of the opening 42 is bounded by a conical centring wall 43 which at its upper edge adjoins the upper surface of the holder and at its lower edge adjoins a cylindrical wall 44 bounding the lower part of the opening 42 (see also Fig. 7). The diameter of the wall 44 is slightly greater than the diameter of the disc so that the disc can be easily inserted into the space bounded by the wall 44. The wall 44 and the centring wall 43 are formed with three radial slots 45 in which catches 46 are slidably guided. Two of the catches are situated at the rear part of the opening 42 and one at the front part.

As is shown in Fig. 7, each catch 46 has at its upper side an inclined surface 47 which slopes in the same direction as the centring wall 43 and which in the released position of the catch, i.e. in the radially outward position thereof, is substantially flush with adjacent portions of the centring wall 43. Beneath each of the two catches 46 which are situated at the rear part of the opening 42 the disc holder 6 has a surface 49 for supporting the disc 29, which surface is so arranged that it contacts the disc only at a peripheral portion thereof which is outside the information-carrying area of the disc. A similar supporting surface 50 is provided beneath the catch 46 which is situated at the front part of the opening 42, which surface also is arranged to cooperate only with a peripheral portion of the disc. Extending across the bottom of the front part of the opening 42 is a wall 51 which adjoins the cylindrical wall 44 of the opening and the edge of which, in the embodiment shown in Figs. 5 and 6, extends along a chord which is substanded by an arc of approximately 100° struck about the centre 42a of the opening 42. The bottom wall 51 carries a pointed support 52 in a position such that it will be situated near the centre hole of a record disc supported in the opening 42 and therefore next that part of the disc surface where no essential information is stored. The bottom wall 51 is deflected, for example, when the holder is gripped. The support 52 is the only part that comes into contact with the disc, so that there is no contact with those parts of the disc where important information is stored. Thus, the disc is protected effectively and there is no risk that the area of the lower disc surface where optically readable information is stored can be damaged, for example, by scratches. As is shown in Fig. 7, the disc 21 is retained on the supporting surfaces 49 and 50 by projecting portions 48 of the catches 46. A wire spring 53 associated with each catch 46 urges the catch into a radially inward latching position.

Latching the disc in the disc holder is effected smoothly, because the disc merely has to be pressed axially downwards on the inclined surfaces 47 of the catches. As the edge of the disc slides down these surfaces the catches 46 are displaced radially outwards thereby until the disc has passed the protecting catch portions 48, after which the springs 53 move the catches 46 back into the latching positions. The catches 46 also each comprise an inclined contact surface 54 (shown in Fig. 7) which performs a function in the release of the catches 46 by means of release elements, which are arranged on the chassis 26 and which comprise upright pins 55 with conical end portions 55a. A pin 55 is provided for each catch 46. As is shown in Fig. 6, three apertures are formed in the bottom of the disc holder 6, two, designated 56, beneath the two catches 46 which are situated at the rear part of the opening 42, and one, designated 57, beneath the catch 46 which is situated at the front part of the opening. The two apertures 56 each have a larger dimension than the aperture 57 in a direction perpendicular to the direction of movement of the adjacent catch 46. Preferably, this dimension of the aperture 57 is substantially equal to the diameter of the pins 55. The apertures 56 and 57 have walls 56a and 57a respectively which extend perpendicularly to the directions of movement of the respective catches 46 and which are situated at substantially equal radial distances from the centre 42a of the opening 42. When, during the second stage of the rearward movement of the carriage 19, the disc holder 6 is lowered vertically into the frame 8 towards the turntable 27, the conical end portions 55a of the pins 55 enter the apertures 56 and 57. The edges of the conical end portions 55a then cooperate with the walls 56a and 57a of the apertures so that the disc holder 6 is centred accurately relative to the axis of rotation 27a of the turntable by the pins 55. In this way the disc 29 is pre-centred satisfactorily before it is lowered onto the centring cone 27c. The smaller dimension of the aperture 57 in the direction perpendicular to the direction of movement of the adjacent catch 46 also provides an effective locking of the disc holder against rotation. As the downward movement of the disc holder continues, the conical end portions 55a of the pins 55 come into contact with the inclined contact surfaces 54 of the catches 46. This is the position

shown in Fig. 3, which is obtained during the movement of the pins 13 of the frame 8 in the grooves 16 in the side walls of the carriage 19. As the holder is lowered further, the catches are moved radially outwards by the pins 55 against the force of the wire springs 53, so that the disc 29 is released. During the upward movement of the disc holder 6 when the disc has been played, the wire springs 53 urge the catches radially inwares to latch the disc in the disc holder again.

The above loading mechanism operates as follows:

In the forward position of the carriage 19 shown in Fig. 2, the pins 13 of the frame 8 are at the upper ends of the grooves 16 in the side walls of the carriage. The pressure arm 31 carrying the pressure member 32 is supported in the upper position above the turntable 27 by the pins 35a and 35b bearing on the guides 17a and 18a respectively. On its upper side the frame 8 preferably has members 8b with upwardly facing inclined surfaces which in the forward position of the carriage 19 cooperate with downwardly facing inclined surfaces on stops 1a fixed in the upper part of the housing 1, so that in this position of the carriage the frame 8 is held firmly between the stops 1a and, via the supports 39 and the chassis 26, the rubber pads 2 and its position cannot be disturbed by shocks to which the housing 1 may be subjected. The disc 29 to be played is first inserted into the opening 42 in the disc holder 6. During the insertion the catches 46 are urged radially outwards by the pressure exerted on the disc 29, the sliding walls 47 adjoining the centre wall so moving the catches into outwardly deflected positions. This enables a disc to be readily inserted into the space bounded by the cylindrical wall 44 of the opening 42. When it has passed the projecting portions 48 of the catches the disc bears on the supporting surfaces 49 and 50 of the disc holder. Immediately after the disc has passed the catch portions 48 the springs 53 urge the catches 46 radially inwards to latch the disc in the disc holder 6. This insertion of the disc into a disc holder has to be effected only once if the disc is to remain in the disc holder and be placed in a storage system when it has been played. The advantage of this is that the disc itself need not be touched; only the holder has to be held at the grip portions 7a and 7b. The lower surface of the disc 29, which is of the "Compact Disc" type, carries optically readable information. The disc is therefore situated in the holder with the information-carrying surface facing downwards. The part of this surface which is near the part of the disc holder is covered by the bottom wall 51 of the holder and is protected thereby against fingerprints. On the other hand, the remaining open part of the bottom of the opening 42 in the disc holder is large enough to allow the turntable 27 to pass through the opening 42 during the lowering of the holder 6, as will be described hereinafter. Once it is latched in the disc holder 6 the disc may be left in any desired position, which also permits a vertical position of the disc during storage or when it is loaded into a player in which the turntable is arranged to rotate about a horizontal as opposed to a vertical axis.

The holder 6 is now inserted into the frame 8 through the opening 4 in the part wall 3 of the housing 1 and through the loading slot 9 in the part of the frame 8. This starts the drive of the carriage 19, and the frame 8, with the disc holder 6, as already stated, moves horizontally with the carriage during the first stage of the rearward movement of the carriage. At the beginning of this movement the members 8b on the frame 8 are disengaged from the stops 1a on the housing 1. During this first stage of the rearward movement of the carriage 19 the transfer means 5 are maintained at a constant upper level by the bars 38 sliding on the horizontal surfaces 39a of the supports 39. The first stage of the rearward movement is terminated by the abutment of the rear ends 38b of the bars 38 with the abutment surfaces 40a of the stops 40. During the second stage of the rearward movement of the carriage 19, due to the movement of the carriage and the inclination of the grooves 16 in the side walls of the carriage, the pins 13 on the frame 8 slide down the grooves 16. As the second stage of the rearward movement of the carriage 19 begins, the pins 35a and 35b on the pressure arm 51 enter the grooves 36 and 37 respectively in the side walls of the carriage. During the first stage of the rearward movement of the carriage the slightly greater length of the forward pins 35a enable these pins to pass over the open upper-ends of the rearward grooves 37 without entering these grooves, which for this reason have a depth slightly smaller than the length of the pins 35a. Due to the cooperation between the pins 13 and the inclined grooves 16 and between the pins 35a and 35b and the inclined grooves 36 and 37, both the transfer means 5 and the pressure arm 31 with the pressure member 32 move substantially vertically towards the turntable 27 during the second stage of the rearward movement of the carriage 19, the pressure member 32 still remaining some distance above the transfer means 5. The transfer means 5, comprising tne frame 8 and the disc holder 6, can move past the turntable 27 without being impeded thereby, owing to the presence of the opening 42 in the disc holder 6. In the position shown in Fig. 3, the holder 6 has already been precentred in the manner described earlier herein by the cooperation of the conical end portions 55a of the pins 55 with the walls 56a and 57a of the apertures 56 and 57 in the disc holder. Also, the conical end portions 55a, by cooperation with the inclined surfaces 54 of the catches 46, have urged the catches radially outwards as the disc holder moves downwards with the frame 8 as indicated by the arrow A in Fig. 7, so that the disc 29 is unlatched. The catches remain in this released position against the force of the springs 53 until the transfer means 5 are raised again. As already described, the holder 6 is locked against rotation by the pins 55. The disc 29 is now clear of the disc holder 6 and can slide onto the centring cone 27c.

This takes place very smoothly owing to the pre-centring of the disc by the pins 55. The transfer means 5 continue to descend until the pins 13 on the frame 8 reach substantially horizontal lower end portions 16a of the grooves 16 in the side walls of the carriage 19. The transfer means are then in a fully lowered position but when they enter this position the pins 35a and 35b on the pressure arm 31 have not yet reached the lower ends of the grooves 36 and 37 respectively in the side walls of the carriage 19. The carriage travels slightly further in thne rearward direction until the pins 13 have reached the ends of the horizontal portions 16a of the grooves 16. This allows the pressure arm 31 to be moved down a little further so that the pressure member 32 can urge the disc effectively onto the turntable, as shown in Fig. 4. It is important that the conical end portions 55a of the release pins 55 are so arranged with respect to the grooves 16, 36 and 37 that the catches 46 are released as the transfer means 5 are lowered past the turntable 27, whilst it may be advantageous if the pressure member 32 acts on the disc immediately after the disc has been lowered onto the turntable 27.

When the disc has been played the button 25 may be pressed to start the forward movement of the carriage 19 in the direction of the arrow 10. During the first stage of this movement the front ends 38a of the bars 38 on the frame 8 abut the abutment surfaces 39b of the supports 39 on the chassis 26. As a result, due to the cooperation between the pins 13 on the frame 8 and the grooves 16 in the side walls of the carriage 19 and between the pins 35a and 35b on the pressure arm 31 and the grooves 36 and 37 respectively in the side walls of the carriage, as the carriage moves forward the frame 8 and disc holder 6 and the pressure arm 31 are moved upwards. In the initial part of this first stage of the forward movement of the carriage 19, however, the pins 13 are located in the horizontal lower end portions 16a of the grooves 16 with the result that the frame 8 and disc holder 6 remain stationary in the lower position as the pressure arm 31 begins to rise. Thus, the pressure member 32 is lifted off the disc 29 by the pressure arm 31 before the disc holder 6 lifts the disc off the turntable 27, the disc being received in the opening 42 in the disc holder again as the holder rises with the frame 8 past the turntable. Immediately after this the inclined surfaces 54 of the catches 46 become disengaged from the end portions 55a of the pins 55 so that the catches 46 are moved radially inwards by the springs 53 to latch the disc in the disc holder again. When the pins 13, 35a and 35b reach the upper ends of the grooves 16, 36 and 37 the second stage of the forward movement of the carriage 19 begins, during which stage the bars 38 on the frame 8 slide on the horizontal surfaces 39a of the supports 39 as the frame 8 and disc holder 6 move forward into the carriage, and the pressure arm 31 with the pressure member 32 is again supported in the upper position by the pins 35a and 35b bearing on the guides 17a and 18a respectively. When the carriage has reached the forward position shown in Fig. 2 again, in which position the members 8b of thne frame 8 engage the stops 1a on the housing so that the frame is in a stable position relative to the housing, the disc holder 6 can be withdrawn from the frame 8 and, if desired, another disc holder containing a disc can be inserted.

It is to be noted that instead of the construction described in the foregoing, where the holder 6 and the pressure member 32 move towards the turntable, it is possible, in a manner not shown, to lift the turntable 27 by means of the pins 55. Essential is the release of the catches 46 by means of the pins 55 without the use of a separate moving mechanism in the player, employing transfer means 5 which can move relative to the turntable to a position at least partly below the level of the turntable 27 and which release the disc during this movement, after which the pressure member 32 presses the disc against the turntable.

The disc holder 6 is very suitable for use in situations in which it is difficult to hold the disc 29 only at its edge in order to avoid leaving fingerprints on the information-carrying surface of the disc. Such a situation may occur in mobile disc-record players, such as those used in cars. The latching of the disc in the disc holder is then of great advantage, because this ensures that shocks exerted to which the player is subjected during operation of the loading mechanism cannot disturb the position of the disc, whilst the pre-centring of the disc holder provides an additional correction possibility before the disc is transferred to the turntable.

Moreover, the disc holder 6 is of advantage for use in disc-record changers, because the holder enables correctly positioned discs to be transferred to and from the turntable during changing of discs without a risk of the discs dropping out of the holders.

Instead of the two grip portions 7a and 7b the disc holder, in a manner not shown, may comprise one central grip projecting from the front of the holder 6 near the aperture 57.

Also, it is to be noted that instead of the magnetic pressure member 32, the disc can be pressed in position on the turntable, in a manner not shown, by means of the pressure arm 31 through spring force acting on the pressure member 32, preferably by means of a compression spring arranged between the arm 31 and the pressure member 32.

Claims

1. A disc-record player comprising:

(a) a housing (1);

(b) a chassis (26) supported in said housing (1);

(c) a turntable (27) rotatably mounted on said chassis (26), the axis of rotation of said turntable (27) defining an axial direction;

(d) a disc reading means (28) displaceably mounted on said chassis (26);

This takes place very smoothly owing to the pre-centring of the disc by the pins 55. The transfer means 5 continue to descend until the pins 13 on the frame 8 reach substantially horizontal lower end portions 16a of the grooves 16 in the side walls of the carriage 19. The transfer means are then in a fully lowered position but when they enter this position the pins 35a and 35b on the pressure arm 31 have not yet reached the lower ends of the grooves 36 and 37 respectively in the side walls of the carriage 19. The carriage travels slightly further in thne rearward direction until the pins 13 have reached the ends of the horizontal portions 16a of the grooves 16. This allows the pressure arm 31 to be moved down a little further so that the pressure member 32 can urge the disc effectively onto the turntable, as shown in Fig. 4. It is important that the conical end portions 55a of the release pins 55 are so arranged with respect to the grooves 16, 36 and 37 that the catches 46 are released as the transfer means 5 are lowered past the turntable 27, whilst it may be advantageous if the pressure member 32 acts on the disc immediately after the disc has been lowered onto the turntable 27.

When the disc has been played the button 25 may be pressed to start the forward movement of the carriage 19 in the direction of the arrow 10. During the first stage of this movement the front ends 38a of the bars 38 on the frame 8 abut the abutment surfaces 39b of the supports 39 on the chassis 26. As a result, due to the cooperation between the pins 13 on the frame 8 and the grooves 16 in the side walls of the carriage 19 and between the pins 35a and 35b on the pressure arm 31 and the grooves 36 and 37 respectively in the side walls of the carriage, as the carriage moves forward the frame 8 and disc holder 6 and the pressure arm 31 are moved upwards. In the initial part of this first stage of the forward movement of the carriage 19, however, the pins 13 are located in the horizontal lower end portions 16a of the grooves 16 with the result that the frame 8 and disc holder 6 remain stationary in the lower position as the pressure arm 31 begins to rise. Thus, the pressure member 32 is lifted off the disc 29 by the pressure arm 31 before the disc holder 6 lifts the disc off the turntable 27, the disc being received in the opening 42 in the disc holder again as the holder rises with the frame 8 past the turntable. Immediately after this the inclined surfaces 54 of the catches 46 become disengaged from the end portions 55a of the pins 55 so that the catches 46 are moved radially inwards by the springs 53 to latch the disc in the disc holder again. When the pins 13, 35a and 35b reach the upper ends of the grooves 16, 36 and 37 the second stage of the forward movement of the carriage 19 begins, during which stage the bars 38 on the frame 8 slide on the horizontal surfaces 39a of the supports 39 as the frame 8 and disc holder 6 move forward into the carriage, and the pressure arm 31 with the pressure member 32 is again supported in the upper position by the pins 35a and 35b bearing on the guides 17a and 18a respectively. When the carriage has reached the forward position shown in Fig. 2 again, in which position the members 8b of thne frame 8 engage the stops 1a on the housing so that the frame is in a stable position relative to the housing, the disc holder 6 can be withdrawn from the frame 8 and, if desired, another disc holder containing a disc can be inserted.

It is to be noted that instead of the construction described in the foregoing, where the holder 6 and the pressure member 32 move towards the turntable, it is possible, in a manner not shown, to lift the turntable 27 by means of the pins 55. Essential is the release of the catches 46 by means of the pins 55 without the use of a separate moving mechanism in the player, employing transfer means 5 which can move relative to the turntable to a position at least partly below the level of the turntable 27 and which release the disc during this movement, after which the pressure member 32 presses the disc against the turntable.

The disc holder 6 is very suitable for use in situations in which it is difficult to hold the disc 29 only at its edge in order to avoid leaving fingerprints on the information-carrying surface of the disc. Such a situation may occur in mobile disc-record players, such as those used in cars. The latching of the disc in the disc holder is then of great advantage, because this ensures that shocks exerted to which the player is subjected during operation of the loading mechanism cannot disturb the position of the disc, whilst the pre-centring of the disc holder provides an additional correction possibility before the disc is transferred to the turntable.

Moreover, the disc holder 6 is of advantage for use in disc-record changers, because the holder enables correctly positioned discs to be transferred to and from the turntable during changing of discs without a risk of the discs dropping out of the holders.

Instead of the two grip portions 7a and 7b the disc holder, in a manner not shown, may comprise one central grip projecting from the front of the holder 6 near the aperture 57.

Also, it is to be noted that instead of the magnetic pressure member 32, the disc can be pressed in position on the turntable, in a manner not shown, by means of the pressure arm 31 through spring force acting on the pressure member 32, preferably by means of a compression spring arranged between the arm 31 and the pressure member 32.

Claims

1. A disc-record player comprising:

(a) a housing (1);

(b) a chassis (26) supported in said housing (1);

(c) a turntable (27) rotatably mounted on said chassis (26), the axis of rotation of said turntable (27) defining an axial direction;

(d) a disc reading means (28) displaceably mounted on said chassis (26);

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(e) a loading mechanism for loading a disc onto said turntable (27) comprising:

(i) a disc holder (6) for holding said disc prior to loading, said disc holder (6) having a cylindrical wall (44) defining a disc-receiving space (42);

(ii) a frame (5) for receiving said disc holder (6) said frame (5) being axially movable relative to said chassis (26) between an upper position, corresponding to said disc not being loaded on said turntable (27) and a lower position corresponding to said disc being loaded on said turntable (27);

(iii) a pressure member (32) which is axially movable relative to said chassis (26) for pressing the disc against said turntable (27); and

(iv) control means for controlling the axial movements of said frame (5) and said pressure member (32) relative to said chassis (26), characterized in that the disc-receiving space (42) of said disc holder (6) is completely open toward the upper side of said disc holder (6), said disc holder (6) having latching means comprising a plurality of latching elements (46) arranged adjacent said cylindrical wall (44) to axially latch said disc, said disc holder (6) having a supporting surface (49, 50) adjacent each latching element (46) for axially supporting said disc on one side and said disc holder (6) having an opening formed in a lower side, said opening being arranged such that said turntable (27) extends there through when said frame (5) is in said lower position;

- release means (55) being axially upwardly directed relative to said chassis (26), cooperating with said latching means (46) for its radially displacement as said disc is moved onto the turntable (27), following which said disc is released from said latching means (46), and cleared from said disc holder (6) and urged against said turntable (27) by said pressure member (32).

2. A disc-record player as claimed in claim 1, characterized by comprising holding means (1a) for holding at least said frame (5) in a fixed position with respect to said housing (1) while said frame (5) is in said upper position for receiving a disc holder (6) through an aperture (4) in said housing (1).

3. A disc-record player as claimed in claim 2, characterized in that responsive to said frame (5) being in said lower position said holding means (1a) releases the frame (5) for movement together with said chassis (26) resiliently with respect to said housing (1).

4. A disc-record player as claimed in Claim 3, characterized in that said holding means comprises stops (1a) being arranged such in said housing (1), that responsive to said frame (5) being in said upper position said frame (5) abuts said stops (1a) so that said frame (5) and said chassis (26) are in a fixed position with respect to said housing (1).

5. A disc-record player as claimed in Claim 1, said control means comprises grooves (16, 17) in a carriage (19) which is movable between forward and rearward positions in the housing (1), said grooves (16, 17) control the upper and downward movements of said frame (5) during movement of said carriage (19), characterized in that the carriage (19) is provided with grooves (36, 37) for controlling the upper and downward movements of said pressure member (32), the arrangement of said release means (55) with respect to the grooves (36, 37) of said pressure member (32) being such that the pressure member (32) urges the disc against the turntable (27) immediately after the release of the disc from said latching elements (46).

6. A disc-record player as claimed in Claim 1, characterized in that said release means comprises pins (55), which in cooperation with walls (56a, 57a) of said disc holder (6) centre the disc holder relative to the turntable (27) and lock the disc holder after release of the disc from said latching elements (46), one pin (55) being situated near the front of the housing (1).

7. A disc holder (6) intended for use in combination with the disc-record player as claimed in Claim 1.

8. A disc holder (6) as claimed in Claim 7, characterized in comprising apertures (45) in the cylindrical wall (44) and in said supporting surface (49, 50) to enable the displacement of a latching element (46).

9. A disc holder (6) as claimed in Claim 7, characterized in that the disc holder (6) comprises a bottom wall (51) at the side which faces the turntable (27), which bottom wall adjoins the supporting surface (50) adjacent a latching element (46) and extends across the bottom of a front part of the space bounded by the cylindrical wall (44).

10. A disc holder (6) as claimed in Claim 9, characterized in that the bottom wall (51) carries a pointed support (52) which is arranged so that it can contact a disc in the holder (6) only near the centre hole of the disc, i.e. at that part of the disc surface where no essential information is stored.

11. A disc holder (6) as claimed in Claim 9, characterized in that the holder comprises a grip portion (7a, 7b) which is arranged at the front part of the holder, said first latching element (46) being arranged between said grip portion (7a, 7b) and said bottom wall (51).

Patentansprüche

1. Plattenspieler mit:

(a) einem Gehäuse (1);

(b) einem in dem genannten Gehäuse (1) angeordneten Gestell (26);

(c) einem auf dem genannten Gehäuse (26) drehbar angeordneten Plattenteller (27), wobei die Drehungsachse des genannten Plattentellers (27) eine axiale Richtung definiert;

(d) Plattenauslesemitteln (28) die verschiebbar auf dem genannten Gestell (26) angeordnet sind;

(e) einem Lademechanismus zum Auflegen einer Platte auf den Plattenteller (27), wobei dieser Mechanismus die folgenden Elemente aufweist:

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(i) eine Plattenhalterung (6) zum Festhalten der genannten Platte vor dem Auflegen, wobei diese Plattenhalterung (6) eine zylinderförmige Wand (44) aufweist, die einen Plattenaufnahmeraum (42) definiert;

(ii) einen Rahmen (5) zum Aufnehmen der genannten Plattenhalterung (6), wobei dieser Rahmen (5) gegenüber dem genannten Gestell (26) zwischen einer oberen Lage, entsprechend dem Zustand, in dem die genannte Platte nicht auf dem genannten Plattenteller liegt, und einer unteren Lage, entsprechend dem Zustand, in dem die Platte auf dem Plattenteller (27) liegt, axial beweglich ist;

(iii) ein Andrückelement (32), das zum Andrükken der Platte gegen den Plattenteller (27) gegenüber dem genannten Gestell (26) axial beweglich ist und

(iv) Steuerelemente zur Steuerung der axialen Bewegungen des genannten Rahmens (5) und des genannten Andrückelementes (32) gegenüber dem genannten Gestell (26),

dadurch gekennzeichnet, dass

- der Plattenaufnahmeraum (42) der genannten Plattenhalterung (6) in Richtung der Oberseite der genannten Plattenhalterung (6) völlig offen ist, wobei die genannte Plattenhalterung (6) Verriegelungsmittel aufweist, die eine Anzahl Verriegelungselemente (46) aufweisen, die neben der genannten zylinderförmigen Wand (44) vorgesehen sind und zwar zur axialen Verriegelung der genannten Platte, wobei die Plattenhalterung (6) eine Trägerfläche (49, 50) aufweist, die an jedes Verriegelungselement (46) grenzt und zwar zur axialen Unterstützung der genannten Platte auf nur einer Seite der genannten Plattenhalterung (6) mit einer Öffnung in einer unteren Seite, wobei diese Öffnung derart vorgesehen ist, dass der genannte Plattenteller (27) sich durch dieselbe hindurch erstreckt, wenn der genannte Rahmen (5) sich in der genannten unteren Lage befindet;

- Freigabemittel (55) sich gegenüber dem genannten Gestell (26) axial aufwärts erstrecken, wobei dieses Gestell zur radialen Verschiebung mit den genannten Entriegerungsmitteln (46) zusammenarbeitet, wenn die genannte Platte auf den Plattenteller (27) bewegt wird, wonach die genannte Platte von den genannten Verriegelungsmitteln (46) freigegeben, von der genannten Plattenhalterung (6) befreit und durch das Anpresselement (32) gegen den genannten Plattenteller (27) gedrückt wird.

2. Plattenspieler nach Anspruch 1, dadurch gekennzeichnet, dass er Haltemittel (1a) aufweist zum Haltern wenigstens des genannten Rahmens (5) in einer festen Lage gegenüber dem genannten Gehäuse (1), während der genannte Rahmen (5) sich in der genannten oberen Lage befindet zum Erhalten einer Plattenhalterung (6) durch eine Öffnung (4) in dem genannten Gehäuse (1) hindurch.

3. Plattenspieler nach Anspruch 2, dadurch gekennzeichnet, dass durch die Tatsache, dass der genannte Rahmen (5) sich in der genannten unteren Lage befindet, die genannten Haltemittel (1a) den Rahmen (5) zur in bezug auf das genannte Gehäuse (1) federnden Bewegung zusammen mit dem genannten Gestell (26) freigeben.

4. Plattenspieler nach Anspruch 3, dadurch gekennzeichnet, dass die genannten Haltemittel Anschläge (1a) aufweisen, die derart in dem genannten Gehäuse (1) vorgesehen sind, dass durch die Tatsache, dass der genannte Rahmen (5) sich in der genannten oberen Lage befindet, der genannte Rahmen (5) gegen die genannten Anschläge (1a) stösst, so dass der genannte Rahmen (5) und das genannte Gestell (26) sich gegenüber dem genannten Gehäuse (1) in einer festen Lage befinden.

5. Plattenspieler nach Anspruch 1, wobei die genannten Steuermittel Rillen (16, 17) in einem Laden (19) aufweisen, der zwischen einer Vorwärts- und einer Rückwärtslage in dem Gehäuse (1) beweglich ist, wobei diese Rillen (16, 17) während der Bewegung des genannten Ladens (19) die Aufwärts- sowie Abwärtsbewegung des genannten Rahmens steuern, dadurch gekennzeichnet, dass der Laden (19) zur Steuerung der Aufwärts- und Abwärtsbewegung des genannten Anpresselementes (32) mit Rillen (36, 37) versehen ist, wobei die Anordnung der genannten Freigabemittel (55) gegenüber den Rillen (36, 37) des genannten Anpresselementes (32) derart ist, dass das Anpresselement (32) unmittelbar nach der Freigabe der Platte aus den Verriegelungselementen (46) die Platte gegen den Plattenteller (27) drück.

6. Plattenspieler nach Anspruch 1, dadurch gekennzeichnet, dass die genannten Freigabemittel Stifte (55) aufweisen, die in Zusammenarbeit mit Wänden (56a, 57a) der genannten Plattenhalterung (6) die Plattenhalterung gegenüber dem Plattenteller (27) zentrieren und die Plattenhalterung nach der Freigabe der Platte aus den genannten Verriegelungselementen (46) verriegeln, wobei ein Stift (55) in der Nähe der Vorderseite des Gehäuses (1) liegt.

7. Plattenhalterung (6) zum Gebrauch in Kombination mit dem Plattenspieler nach Anspruch 1.

8. Plattenhalterung (6) nach Anspruch 7, dadurch gekennzeichnet, dass sie in der Zylinderwand (44) sowie in der genannten Trägerfläche (49, 50) Öffnungen (50) aufweist zur Ermöglichung einer Verschiebung eines Verriegelungselementes (46).

9. Plattenhalterung (6) nach Anspruch 7, dadurch gekennzeichnet, dass die Plattenhalterung (6) eine Bodenwand (51) an derjenigen Seite aufweist, die dem Plattenteller (27) zugewandt ist, wobei diese Bodenwand an die Trägerfläche (50) neben einem Verriegelungselement (46) grenzt und sich über den Boden eines Vorderteils des durch die Zylinderwand (44) abgegrenzten Raumes erstreckt.

10. Plattenhalterung (6) nach Anspruch 9, dadurch gekennzeichnet, dass die Bodenwand (51) eine punktförmige Unterstützung (52) aufweist, die derart vorgesehen ist, dass sie eine Platte in der Halterung (6) nur in der Nähe der

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Zentralöffnung der Platte berühren kann, d.h. in demjenigen Teil der Plattenoberfläche, an dem keine wesentliche Information gespeichert ist.

11. Plattenhalterung (6) nach Anspruch 9, dadurch gekennzeichnet, dass die Halterung einen Greifteil (7a, 7b) aufweist, der auf der Vorderseite der Halterung Vorgesehen ist, wobei das genannte erste Verriegelungselement (46) zwischen dem genannten Greifteil (7a, 7b) und der genannten Bodenwand (51) vorgesehen ist.

Revendications

1. Lecteur de disque comprenant:
(a) un boîtier (1);
(b) un châssis (26) monté dans le boîtier (1);
(c) un plateau (27) monté à rotation sur le châssis (26), l'axe de rotation du plateau (27) définissant une direction axiale;
(d) un dispositif de lecture de disque (28) monté de manière déplaçable sur le châssis (26);
(e) un mécanisme de chargement pour charger un disque sur le plateau (27) comprenant:
(i) un support de disque (6) destiné à supporter le disque avant le chargement, le support de disque (6) comportant une paroi cylindrique (44) délimitant un espace de réception de disque (42);
(ii) un cadre (5) pour recevoir le porte-disque (6), le cadre (5) étant mobile axialement par rapport au châssis (26) entre une position supérieure, correspondant à une position de non chargement du disque sur le plateau (27), et une position inférieure, correspondant à la position de chargement du disque sur le plateau (27);
(iii) un élément presseur (32) qui est axialement mobile par rapport au châssis (26) pour presser le disque contre le plateau (27), et
(iv) un dispositif de commande pour commander les déplacements axiaux du cadre (5) et de l'élément presseur (32) par rapport au châssis (26);
caractérisé en ce que
- l'espace de réception de disque (42) du support de disque (6) est complètement ouvert en direction du côté supérieur du support de disque (6), le support de disque (6) comportant des moyens de verrouillage comprenant plusieurs éléments de verrouillage (46) disposés près de la paroi cylindrique (44) pour verrouiller le disque axialement, le support de disque (6) comportant une surface de support (49, 50) adjacente à chaque élément de verrouillage (46) pour supporter le disque axialement d'un côté et le support de disque (6) comportant une ouverture ménagée dans un côté inférieur, l'ouverture étant disposée de telle façon que le plateau (27) traverse cette ouverture lorsque le cadre (5) se trouve dans la position inférieure;
- des moyens de déverrouillage (55) orientés axialement vers le haut par rapport au châssis (26) coopérant avec les moyens de verrouillage (46) en vue de leur déplacement radial lorsque le disque est amené sur le plateau (27), après quoi le disque est déverrouillé des moyens de verrouillage (46), est dégagé du support de disque (6) et est sollicité contre le plateau (27) par l'élément presseur (32).

2. Lecteur de disque suivant la revendication 1, caractérisé en ce qu'il comprend des moyens de retenue (1a) pour retenir au moins le cadre (5) dans une position fixe par rapport au boîtier (1), tandis que le cadre (5) se trouve dans la position supérieure pour recevoir un support de disque (6) à travers une ouverture (4) dans le boîtier (1).

3. Lecteur de disque suivant la revendication 2, caractérisé en ce qu'en réponse à la présence du cadre (5) dans la position inférieure, les moyens de retenue (1a) libèrent le cadre (5) pour lui permettre de se déplacer conjointement avec le châssis (26) élastiquement par rapport au boîtier (1).

4. Lecteur de disque suivant la revendication 3, caractérisé en ce que les moyens de retenue comprennent des arrêts (1a) qui sont disposés de telle façon dans le boîtier (1) qu'en réponse à la présence du cadre (5) dans la position supérieure, ce cadre (5) vienne buter contre les arrêts (1a), de sorte que le cadre (5) et le châssis (26) se trouvent dans une position fixe par rapport au boîtier (1).

5. Lecteur de disque suivant la revendication 1, dans lequel le dispositif de commande comprend des rainures (16, 17) dans un tiroir (19) qui est mobile entre une position antérieure et une position postérieure dans le boîtier (1), les rainures (16, 17) commandant les déplacements vers le haut et vers le bas du cadre (5) pendant le déplacement du tiroir (19), caractérisé en ce que le tiroir (19) est pourvu de rainures (36, 37) destinées à commander les déplacements vers le haut et vers le bas de l'élément presseur (32), l'agencement des moyens de déverrouillage (55) par rapport aux rainures (36, 37) de l'élément presseur (32) étant tel que l'élément presseur (32) sollicite le disque contre le plateau (27) immédiatement après le déverrouillage du disque des éléments de verrouillage (46).

6. Lecteur de disque suivant la revendication 1, caractérisé en ce que les moyens de déverrouillage comprennent des broches (55) qui, en coopération avec les parois (56a, 57a) du support de disque (6), centrent le support de disque par rapport au plateau (27) et bloquent le support de disque après déverrouillage du disque des éléments de verrouillage (46), une broche (55) étant située près de l'avant du boîtier (1).

7. Support de disque (6) destiné à être utilisé en combinaison avec le lecteur de disque suivant la revendication 1.

8. Support de disque (6) suivant la revendication 7, caractérisé en ce qu'il comprend des ouvertures (45) dans la paroi cylindrique (44) et dans la surface de support (49, 50) pour permettre le déplacement d'un élément de verrouillage (46).

9. Support de disque (6) suivant la revendication 7, caractérisé en ce qu'il comprend une paroi de fond (51) du côte qui est tourné vers le plateau (27), cette paroi de fond se raccordant à la surface de support (50) près d'un élément de

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verrouillage (46) et s'étendant en travers du bas d'une partie antérieure de l'espace délimité par la paroi cylindrique (44).

10. Support de disque (6) suivant la revendication 9; caractérisé en ce que la paroi de fond (51) porte un support pointu (52) qui est disposé de manière à pouvoir entrer en contact avec un disque présent dans le support (6) uniquement prés de l'ouverture centrale du disque, c'est-à-dire au niveau de la partie de la surface du disque sur laquelle aucune information essentielle n'est enregistrée.

11. Support de disque (6) suivant la revendication 9, caractérisé en ce qu'il comprend une partie d'agrippage (7a, 7b) qui est disposée au niveau de sa partin antérieure, le premier élément de verrouillage (46) étant disposé entre la partie d'agrippage (7a, 7b) et la parbi de fond (51).

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