Description

The invention relates to a device for centring, during operation, a disk to be read or recorded while rotating and having a central disk hole, the device comprising a turntable which, during operation, can be rotated about an axis of rotation and a number of centring parts which are connected to said turntable and which, in the operating condition of the disk, are situated at least partly in the central disk hole and each of which can be swung against the resilience with their free ends in the direction of the axis of rotation about a pivot extending at least substantially tangentially with respect to a circle situated concentrically about the axis of rotation.

Furthermore the invention relates to a centring member and a turntable.

Such a device is disclosed in United States Patent Specification 4,218,065 (herewith incorporated by reference). As explained in the said Specification it is necessary in devices for optically reading or optically writing a disk to accommodate the disk in a position which is correct as accurately as possible both for writing and reading and both in the axial and radial directions.

In order to obtain in particular a good accommodation in the radial direction, centring parts are provided in said known construction each of which are connected with one end to a supporting member in such a manner that the free ends of said centring parts can be swung independently of each other against resilient action in the direction towards the axis of rotation. In itself this construction is satisfactory but if a force in the plane of the disk is exerted on the disk placed on the turntable, as a result of which it is moved in a position which is eccentric with respect to the axis of rotation, some of the centring parts will be swung with their free ends in the direction towards the axis of rotation, while further centring parts situated approximately diametrically opposite to said centring parts will tend to swing in a direction away from the axis of rotation under the influence of the resilient force. When the said force is removed it may occur that, as a result of the occurring friction between the centring parts and the edge of the disk hole, the disk can be forced back by the centring parts into the position which is not accurately concentric with respect to the axis of rotation and hence the disk will remain in a position which is slightly eccentric with respect to the axis of rotation.

It is the object of the invention to provide a device of the above-mentioned type in which this disadvantage can be mitigated.

According to the invention this can be achieved in that the centring parts, at their ends remote from their free ends, are connected to connection strips which adjoin said ends and which extend away from the ends in question of the centring parts in the direction towards the axis of rotation and extend towards each other, the ends of the connection strips remote from the centring parts being connected together.

When using the construction according to the invention, if the free end of a centring part is swung in the direction towards the axis of rotation, said movement will be transferred, via the connection strips, to the other centring parts in such a manner that the said centring parts will also move in the direction towards the axis of rotation with their free ends as a result of which the centring parts will ensure a position of the disk which is concentric with respect to the axis of rotation.

The invention will now be described in greater detail with reference to a few embodiments of the construction according to the invention shown diagrammatically in the accompanying Figures.

Figure 1 is a diagrammatic sectional view of a turntable and a number of centring parts connected to said turntable.

Figure 2 is a plan view of Figure 1,

Figure 3 is a diagrammatic sectional view of a second embodiment of a turntable having centring parts connected to said turntable,

Figure 4 is a plan view of Figure 3,

Figure 5 is a sectional view through a centring member comprising a number of centring parts.

Figure 6 is a plan view of Figure 5,

Figure 7 is a sectional view through a turntable to be used with the centring member shown in Figures 5 and 6,

Figure 8 is a plan view of Figure 7.

Figure 9 is a sectional view through the turntable shown in Figures 7 and 8 with the centring member shown in Figures 5 and 6.

Figure 10 is a plan view of Figure 9.

Figures 1 and 2 show a turntable 2 which, during operation, can be rotated about an axis of rotation 1 and which comprises a plate-shaped base part 3 which extends at right angles to the axis of rotation 1 and on the outer circumference of which an upright edge 4 is formed integrally with said base part 3.

The turntable 2 may be incorporated in an optical disk player and be connected to a drive spindle which can be inserted into a hole 5 in the plate-shaped base part. The arrangement of the turntable in a video player may be, for example, as described in the above-mentioned United Sates Patent Specification 4,218,065. Since the further construction of the disk player in which the turntable is incorporated does not form part of the invention, such a disk player has not been shown and will not be described.

Parts 6 in the form of circular segments and adjoining the base portion within the edge 4 are provided on the upper surface of the plate-shaped base part and adjoin four radially extending grooves 7 rotated through 90° about the axis of rotation 1 with respect to each other. A connection element 8 to the end of which a finger like centring part 9 extending upwards from the connection element is connected, is present in each of the grooves 7. In the embodiment shown in Figure 1, each connection element with the parts 6 present on each side thereof is connected to a pivot 10 which extends at right angles to the longitudinal axis of the groove 7 in which the connection element in question is situated. Said piv-

ot 10 may be formed by a pin as is shown in Figure 1, but when the turntable 2 with the parts 6 and the connection elements are manufactured as one assembly of a synthetic resin, such a pivoting joint can also be realized by means of a suitable connection between the edge 4 of the turntable and the connection elements 8 forming such a pivot and forming one assembly with the remaining parts.

Connection strips 11 which form one assembly with the connection elements 8 adjoin the ends of the said elements. The connection strips of connection elements 8 situated diametrically opposite to each other extend in facing directions. Furthermore, of every two connection elements succeeding each other in the circumferential direction, the ends of the connection strips 11 remote from the connection elements in question and adjoining the ends of the connection element 8 in question situated nearest to each other are connected together in such a manner that these connection strips 11 forming one assembly constitute an L-shaped connection member between two adjacent connection elements.

As may furthermore be seen in particular from Figure 1 the free ends of the centring parts 9 are rounded off so that a disk can easily be slid over said centring parts in the direction of the arrow A, the outermost boundary surfaces 12 of the centring parts 9 which extend substantially parallel to the axis of rotation 1 becoming located against the rigid boundary edge of the central disk hole.

If a force directed more or less radially with respect to the axis of rotation 1 is exerted in the direction towards the axis of rotation on a centring part 9, the centring part 9 in question will be rotated about the pivot 10 in question. This movement is transmitted, via the connection element 8 supporting the centring part 9 in question, to the connection strips 11 connected to the ends of said connection element, which strips, in view of their large height, measured in a direction parallel to the axis of rotation 1 have a great bending strength and a small torsional strength in comparison with their thickness. If consequently a centring part is swung in the direction towards the axis of rotation 1 with its free upper end as shown in Figure 1, the ends of the connection strips 11 connected to the centring part 9 in question and situated nearest to the axis of rotation will tend to move downwards as viewed in Figure 1. Since these ends of the connection strips are connected to connection strips which extend at right angles to the said connection strips and which are connected to the connection elements of centring parts which are situated on each side of the centring part moved with its free end in the direction towards the axis of rotation 1, the free ends of said further centring parts will also tend to swing in the direction towards the axis of rotation 1, and since these further centring parts are also connected, via connection strips, to the centring part which is situated diametrically opposite to the centring part which is moved with its free end initially in the direction towards the axis of rotation 1, all centring parts will ultimately be moved with their free ends in the direction towards the axis of rotation 1 against the inherent resilient force of the connection strips 11 which are connected together and are manufactured from a synthetic resin.

So by using the construction according to the invention the arrangement of the centring parts, also if one of the centring parts 9 is swung with its free end in the direction towards the axis of rotation, also remains at least substantially concentric with respect to the axis of rotation 1, so that a correct centring of the disk on the turntable with respect to the axis of rotation will always be ensured.

The example of this construction in accordance with the invention shown in Figures 3 and 4 corresponds at least substantially to the construction described hereinbefore with reference to Figures 1 and 2 and components in Figures 3 and 4 corresponding to components shown in Figures 1 and 2 are therefore referred to by the same reference numerals as used in Figures 1 and 2.

In this embodiment the pivot is formed by a thin ridge 13 of a synthetic resin material which connects the element 8 to the turntable on its side remote from the axis of rotation. In this embodiment it is ensured that the imaginary axis of rotation about which a centring part 9 can be swung with respect to the turntable is situated at a larger distance from the axis of rotation 1 than the boundary edge 12 of the centring part which cooperates with the rigid edge of the disk hole. When pressing the disk in the direction of the arrow A the centring parts can consequently swing easily in the direction towards the axis of rotation whereas, when pulling the disk in a direction away from the arrow A, it will tend to move outwards. Consequently the force necessary to provide the disk will be smaller than the force necessary to remove the disk from the turntable.

A preferred embodiment of the construction according to the invention of the turntable and centring parts is shown in Figures 5-10. In this construction a centring member 14 manufactured from a synthetic resin is used which in the embodiment shown comprises twelve centring parts 15 which are arranged at regular angular distances from each other and which, as shown in Figure 5, each adjoin with their lower end a connection element 17 extending concentrically about the centre line 16 of the centring member 14. The connection elements 17 supporting the centring parts 15 are connected, by means of a thin flange-shaped part 18, to a supporting ring 19 forming the outer circumference of the centring member 14. At the area of each centring part a recess 20 is provided in the flange-shaped part 18 between the connection element 17 associated with the relevant centring part and the supporting ring 19. Centrally between each set of adjacent recesses 20 a slot 21 is provided radially in the flange-shaped part 18 and separates the adjacent ends of the connection elements 17 from adjacent centring parts 15 and furthermore extends up to a short distance from the inner circumference of the supporting ring 19 in the flange-shaped part 18.

Each of the connection elements 17 is adjoined by two parallel extending connection strips 22 which also extend parallel to a radial plane through the axis of rotation 16 situated centrally between said strips.

The juxtaposed connection strips 22 which adjoin the facing ends of two connection elements 17 succeeding each other in the circumferential direction are connected together with their ends remote from the connection elements in question by a connection part 23 extending concentrically about the axis of rotation 16. So all centring parts 15 are connected together via the connection elements 17 supporting the said centring parts, the connection strips 22 adjoining the said elements 17, and the connection parts 23 connecting the said connection strips together.

As may be seen from Figures 5 and 6, the connection strips 22, measured in the direction of the centre line 16, have a comparatively large height as compared with their thickness.

The part of the comparatively thin flange-shaped part 18 situated at the area of the centring part constitutes an imaginary pivot which extends at right angles to a radius through the centre of the centring part 15 in question and about which the centring part 15 in question can be swung with respect to the annular part 19. It will be obvious that such a swing of a centring part 15 will be transmitted, via the connection element 17 supporting the centring part 15 and the connection strips 22 connected to said centring part, to the other connection strips 22, connection elements 17 and centring parts 15, so that in this embodiment also the swinging of a centring part 15 in the direction towards the centre line 16 will result in the remaining centring parts also tending to swing with their free ends in the directions towards the centre line 16 against the inherent resilience of the interconnected connection strips 22. The operation of said centring member 14 hence is in principle equal to that of the preceding embodiments. In this case also the imaginary pivot about which a centring part 15 can be swung is situated at a larger distance from the centre line 16 of the centring member 14 than the outermost boundary plane 24 of the centring part which cooperates with the boundary edge of the disk hole.

The centring member described hereinbefore with reference to Figures 5 and 6 is destined in particular for use in combination with a turntable as shown in Figures 7 and 8. Said turntable 25 comprises a plate-shaped part 26 which is connected to a centrally accommodated hub 27 comprising a central hole 28 for receiving a drive spindle.

On its outer circumference the plate-shaped part comprises a drooping circumferential shoulder 29 as is shown in Figure 7. At the area of the transition from the plate-shaped part 26 in the hub 27 twelve passages 30 are provided in the turntable at regular distances from each other.

As is shown in particular in Figures 9 and 10 the construction is such that the centring member 14 can be incorporated in the space surrounded by the drooping shoulder 29, the centring parts 15 falling in the recesses 30 and projecting with their upper ends above the plate-shaped part 26. As is shown in particular in Figure 10 the outsides of the centring members are free from the walls of the recesses 30. The inside diameter of the shoulder 29 and the outside diameter of the supporting ring 19 are such that the centring member is retained in the position shown in Figure 9 with respect to the turntable, for example, by friction between the outer circumference of the supporting ring 19 and the inner wall of the shoulder 29. When a disk is placed on the turntable in the direction of the arrow B, said disk, viewed in Figure 9, will bear on the top of the turntable, the outermost boundary surfaces of the centring parts engaging the boundary edge of the disk hole and thus centring the disk with respect to the axis of rotation of the turntable.

Since the conical upper end of the hub 27 projects above the top ends of the centring parts 15, said top end of the hub guides the disk, when the disk is placed on the turntable, to a position which is at least substantially concentric with respect to the axis of rotation of the turntable before the disk contacts the centring parts, as a result of which it is counteracted that undesired forces influence said centring parts. The cylindrical part of the hub adjoining the conical top end has an outside diameter which is only slightly smaller than the diameter of the circle on which the outermost boundary surfaces 24 of the centring parts 15 contacting the edge of the disk hole are situated. As a result of this only parts of the free ends of the centring parts 15 cooperating with the boundary edge of the disk edge project slightly beyond the outer circumference of the hub so that said centring parts are incorporated in the turntable so as to be readily protected.

Although in the above embodiments the resilience against the action of which the centring parts can be swung in the direction towards the axis of rotation is provided by the inherent resilience of the connection strips manufactured from a synthetic resin integrally with the centring parts, it will also be feasible to provide separate springs for providing the required resilience.

Claims

1. A device for centring, during operation, a disk to be read or recorded while rotating and having a central disk hole, the device comprising a turntable (2, 25) which, during operation, can be rotated about an axis (1, 16) of rotation and a number of centring parts (9, 15) which are connected to said turntable and which, in the operating condition of the disk, are situated at least partly in the central disk hole and each of which can be swung against the resilience with their free ends in the direction towards the axis of rotation about a pivot extending at least substantially tangentially with respect to a circle situated concentrically about the axis of rotation, characterized in that the centring parts (9, 15), at their ends (8, 17) remote from their free ends, are connected to connection strips (11, 22) which adjoin said ends and which extend away from the ends in question of the centring parts in the direction towards the axis of rotation (1, 16) and extend towards each other, the ends of the connection strips remote from the centring parts being connected together.

2. A device as claimed in Claim 1, characterized in that each centring part (9, 15) is connected to two

The juxtaposed connection strips 22 which adjoin the facing ends of two connection elements 17 succeeding each other in the circumferential direction are connected together with their ends remote from the connection elements in question by a connection part 23 extending concentrically about the axis of rotation 16. So all centring parts 15 are connected together via the connection elements 17 supporting the said centring parts, the connection strips 22 adjoining the said elements 17, and the connection parts 23 connecting the said connection strips together.

As may be seen from Figures 5 and 6, the connection strips 22, measured in the direction of the centre line 16, have a comparatively large height as compared with their thickness.

The part of the comparatively thin flange-shaped part 18 situated at the area of the centring part constitutes an imaginary pivot which extends at right angles to a radius through the centre of the centring part 15 in question and about which the centring part 15 in question can be swung with respect to the annular part 19. It will be obvious that such a swing of a centring part 15 will be transmitted, via the connection element 17 supporting the centring part 15 and the connection strips 22 connected to said centring part, to the other connection strips 22, connection elements 17 and centring parts 15, so that in this embodiment also the swinging of a centring part 15 in the direction towards the centre line 16 will result in the remaining centring parts also tending to swing with their free ends in the directions towards the centre line 16 against the inherent resilience of the interconnected connection strips 22. The operation of said centring member 14 hence is in principle equal to that of the preceding embodiments. In this case also the imaginary pivot about which a centring part 15 can be swung is situated at a larger distance from the centre line 16 of the centring member 14 than the outermost boundary plane 24 of the centring part which cooperates with the boundary edge of the disk hole.

The centring member described hereinbefore with reference to Figures 5 and 6 is destined in particular for use in combination with a turntable as shown in Figures 7 and 8. Said turntable 25 comprises a plate-shaped part 26 which is connected to a centrally accommodated hub 27 comprising a central hole 28 for receiving a drive spindle.

On its outer circumference the plate-shaped part comprises a drooping circumferential shoulder 29 as is shown in Figure 7. At the area of the transition from the plate-shaped part 26 in the hub 27 twelve passages 30 are provided in the turntable at regular distances from each other.

As is shown in particular in Figures 9 and 10 the construction is such that the centring member 14 can be incorporated in the space surrounded by the drooping shoulder 29, the centring parts 15 falling in the recesses 30 and projecting with their upper ends above the plate-shaped part 26. As is shown in particular in Figure 10 the outsides of the centring members are free from the walls of the recesses 30. The inside diameter of the shoulder 29 and the outside diameter of the supporting ring 19 are such that the centring member is retained in the position shown in Figure 9 with respect to the turntable, for example, by friction between the outer circumference of the supporting ring 19 and the inner wall of the shoulder 29. When a disk is placed on the turntable in the direction of the arrow B, said disk, viewed in Figure 9, will bear on the top of the turntable, the outermost boundary surfaces of the centring parts engaging the boundary edge of the disk hole and thus centring the disk with respect to the axis of rotation of the turntable.

Since the conical upper end of the hub 27 projects above the top ends of the centring parts 15, said top end of the hub guides the disk, when the disk is placed on the turntable, to a position which is at least substantially concentric with respect to the axis of rotation of the turntable before the disk contacts the centring parts, as a result of which it is counteracted that undesired forces influence said centring parts. The cylindrical part of the hub adjoining the conical top end has an outside diameter which is only slightly smaller than the diameter of the circle on which the outermost boundary surfaces 24 of the centring parts 15 contacting the edge of the disk hole are situated. As a result of this only parts of the free ends of the centring parts 15 cooperating with the boundary edge of the disk edge project slightly beyond the outer circumference of the hub so that said centring parts are incorporated in the turntable so as to be readily protected.

Although in the above embodiments the resilience against the action of which the centring parts can be swung in the direction towards the axis of rotation is provided by the inherent resilience of the connection strips manufactured from a synthetic resin integrally with the centring parts, it will also be feasible to provide separate springs for providing the required resilience.

Claims

1. A device for centring, during operation, a disk to be read or recorded while rotating and having a central disk hole, the device comprising a turntable (2, 25) which, during operation, can be rotated about an axis (1, 16) of rotation and a number of centring parts (9, 15) which are connected to said turntable and which, in the operating condition of the disk, are situated at least partly in the central disk hole and each of which can be swung against the resilience with their free ends in the direction towards the axis of rotation about a pivot extending at least substantially tangentially with respect to a circle situated concentrically about the axis of rotation, characterized in that the centring parts (9, 15), at their ends (8, 17) remote from their free ends, are connected to connection strips (11, 22) which adjoin said ends and which extend away from the ends in question of the centring parts in the direction towards the axis of rotation (1, 16) and extend towards each other, the ends of the connection strips remote from the centring parts being connected together.

2. A device as claimed in Claim 1, characterized in that each centring part (9, 15) is connected to two



connection strips (11, 22) which are accommodated symmetrically with respect to a plane extending through the axis of rotation (1, 16) and the centre of the centring part (9, 15) in question, the connection strips situated closest together of two centring parts succeeding each other in the circumferential direction being connected together.

3. A device as claimed in Claim 1 or 2, characterized in that the centring parts (9, 15) and the connection strips (11, 22) are manufactured from one piece of a resilient synthetic resin to form a centring member (14).

4. A device as claimed in any of the preceding Claims, characterized in that a connection strip (11, 22) has a rectangular cross-section the long rectangular side of which extends at least substantially parallel to the axis of rotation (1, 16).

5. A device as claimed in any of the preceding Claims, characterized in that one end of each centring part (15) is connected to a connection element (17) extending concentrically about the axis of rotation and the connection elements are connected, by means of a flange-shaped part (18), to a supporting ring (19) extending concentrically with respect to the axis of rotation and surrounding the connection elements, all this in such a manner that the connection elements (17) with the centring parts (15) can swing with respect to the supporting ring (19) about imaginary pivots formed by the flange-shaped part.

6. A device as claimed in Claim 5, characterized in that a hole (20) is provided in the flange-shaped part (18) at the area of each centring part (15).

7. A device as claimed in Claim 5 or 6, characterized in that at the area of adjacent ends of connection elements (17) supporting two centring parts (15) a groove (21) is provided in the flange-shaped part (18) which extends radially from the inner circumference of said flange-shaped part (18).

8. A device as claimed in any of the preceding Claims, characterized in that the device comprises twelve centring parts (15) provided at regular angular distances from each other.

9. A device as claimed in any of the preceding Claims, characterized in that said centring member (14) is connected to the turntable (25) so as to be detachable.

10. A device as claimed in Claim 9, characterized in that the turntable (25), on its side remote from the supporting surface for the disk, comprises a recess for incorporating the centring member (14), recesses (30) situated at regular distances from each other being provided in the turntable for passing the centring parts (15) of the centring member (14) in such a manner that the free ends of the centring parts (15) project above the supporting surface.

11. A device as claimed in Claim 10, characterized in that the turntable comprises a central hub (27) of which the part projecting above the free ends of the centring parts (15) is conical in such a manner that the diameter of said part increases gradually from the end of the hub in the direction of the centring parts (15).

12. A device as claimed in Claim 11, characterized in that the free ends of the centring parts (15) are situated at the area of a part of the hub (27) of the turntable the outside diameter of which is only slightly smaller than the diameter of the circle on which the boundary surfaces (24) of the centring parts (15) contacting the edge of the disk hole are situated, in such a manner that said free ends of the centring parts are incorporated at least for the greater part in parts of the recesses (30) formed in the turntable and situated in the outer circumference of the hub (27).

13. A centring member (14) suitable for a device as claimed in any of the preceding claims, comprising a number of centring parts (15) supported by connection elements (17) which can swing about on imaginary pivot with respect to a supporting ring (19), characterized in that said centring parts (15) are united by connection strips (11, 22) and said imaginary pivot is made by means of a flange shaped part (18) located between the connection elements (17) and the supporting ring (19).

14. A turntable (25) suitable for use in combination with a centring member (14) as claimed in claim 13, comprising a plate shaped part (26) connected to a central hub (27), characterized in that said central hub (27) is provided with openings (30) for the passage of the centring parts (15) of the centring member (14).

Patentansprüche

1. Vorrichtung zum im Betrieb Zentrieren einer im drehenden Zustand auszulesenden oder aufzuzeichnenden Platte mit einem zentralen Plattenloch, wobei diese Vorrichtung einen Plattenteller (2, 25) aufweist, der im Betrieb um eine Drehungsachse (1, 16) gedreht werden kann und mit einer Anzahl mit dem genannten Plattenteller verbundener Zentrierteile (9, 15), die in dem Betriebszustand der Platte wenigstens teilweise in dem zentralen Plattenloch liegen und von denen jeder Teil mit dessen freiem Ende entgegen der Federkraft in Richtung der Drehungsachse um einen Zapfen geschwungen werden kann, der sich wenigstens im wesentlichen in bezug auf einen Kreis, der konzentrisch um die Drehungsachse liegt, tangentiell erstreckt, dadurch gekennzeichnet, daß die Zentrierteile (9, 15) an ihren von den freien Enden abgewandten Enden (8, 17) mit Verbindungsstreifen (11, 22) verbunden sind, die sich an die genannten Enden anschließen und sich von den betreffenden Enden der Zentrierteile in Richtung der Drehungsachse (1, 16) weg und sich aufeinander zu erstrecken, wobei die von den Zentrierteilen abgewandten Enden der Verbindungsstreifen miteinander verbunden sind.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß jeder Zentrierteil (9, 15) mit zwei Verbindungsstreifen (11, 22) verbunden ist, die gegenüber einer Ebene durch die Drehungsachse (1, 16) und die Mitte des betreffenden Zentrierteils (9, 15) symmetrisch angeordnet sind, wobei von zwei in der Umfangsrichtung gerechnet aufeinander folgenden Zentrierteilen die einander am nächsten liegenden Verbindungsstreifen miteinander verbunden sind.

3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Zentrierteile (9, 15) und die



Verbindungsstreifen (11, 22) aus einem einzigen Teil aus federndem Kunststoff zum Binden eines Zentrierelementes (14) hergestellt sind.

4. Vorrichtung nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß ein Verbindungsstreifen (11, 22) einen rechteckigen Querschnitt hat, wobei die lange Rechteckseite sich wenigstens im wesentlichen parallel zu der Drehungsachse (1, 16) erstreckt.

5. Vorrichtung nach einem der vorherstehenden Ansprüche, dadurch gekennzeichnet, daß ein Ende jedes Zentrierteils (15) mit einem Verbindungselement (17) verbunden ist, das sich konzentrisch zu der Drehungsachse erstreckt, und daß die Verbindungselemente mittels eines flanschförmigen Teils (18) mit einem Unterstützungsring (19) verbunden sind, der sich konzentrisch der Drehungsachse erstreckt und die Verbindungselemente umgibt, dies alles derart, daß die Verbindungselemente (17) mit den Zentrierteilen (15) gegenüber dem Unterstützungsring (19) um durch den flanschförmigen Teil gebildete imaginäre Zapfen schwingen können.

6. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß in dem flanschförmigen Teil (18) im Bereich jedes Zentrierteils (15) ein Loch (20) vorgesehen ist.

7. Vorrichtung nach Anspruch 5 oder 6, dadurch gekennzeichnet, daß im Bereich benachbarter Enden von Verbindungselementen (17) mit zwei Zentrierteilen (15) in dem flanschförmigen Teil (18) eine Rille (21) vorgesehen ist, die sich von dem Innenumfang des genannten flanschförmigen Teils (18) radial erstreckt.

8. Vorrichtung nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß sie zwölf Zentrierteile (15) aufweist, die in regelmäßigen Winkelabständen voneinander angeordnet sind.

9. Vorrichtung nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das genannte Zentrierelement (14) entfernbar mit dem Plattenteller (25) verbunden ist.

10. Vorrichtung nach Anspruch 9, dadurch gekennzeichnet, daß der Plattenteller (25) auf der von der Unterstützungsfläche für die Platte abgewandten Seite eine Ausnehmung aufweist zum Aufnehmen des Zentrierelementes (14), wobei zum Hindurchlassen der Zentrierteile (15) des Zentrierelementes (14) in dem Plattenteller in regelmäßigen Abständen voneinander Ausnehmungen (30) vorgesehen sind, und zwar derart, daß die freien Enden der Zentrierteile (15) über die Unterstützungsfläche hinausragen.

11. Vorrichtung nach Anspruch 10, dadurch gekennzeichnet, daß der Plattenteller eine zentrale Nabe (27) aufweist, deren über die freien Enden der Zentrierteile (15) hinausragender Teil kegelförmig ist, und zwar derart, daß der Durchmesser des genannten Teils von dem Ende der Nabe in Richtung der Zentrierteile (15) allmählich zunimmt.

12. Vorrichtung nach Anspruch 11, dadurch gekennzeichnet, daß die freien Enden der Zentrierteile (15) in der Nähe eines Teils der Nabe (27) des Plattentellers liegen, dessen Außendurchmesser nur etwas kleiner ist als der Durchmesser des Kreises, auf dem die Begrenzungsflächen (24) der Zentrierteile (15) liegen, die den Rand des Plattenloches berühren, und zwar derart, daß die genannten freien Enden der Zentrierteile wenigstens zum größten Teil in Teile der Ausnehmungen (30) aufgenommen sind, die in dem Plattenteller gebildet sind und in dem Außenumfang der Nabe (27) liegen.

13. Zentrierelement (14) für eine Vorrichtung nach einem der vorstehenden Ansprüche, mit einer Anzahl Zentrierteile (15), die durch Verbindungselemente (17) unterstützt werden, die um einen imaginären Zapfen gegenüber einem Unterstützungsring (19) schwingen können, dadurch gekennzeichnet, daß die genannten Zentrierteile (15) durch Verbindungsstreifen (11, 22) verbunden sind und der imaginäre Zapfen durch einen flanschförmigen Teil (18) zwischen den Verbindungselementen (17) und dem Unterstützungsring (19) gebildet ist.

14. Plattenteller (25) zum Gebrauch in Kombination mit einem Zentrierelement (14) nach Anspruch 13, mit einem mit einer zentralen Nabe (27) verbundenen plattenförmigen Teil (26), dadurch gekennzeichnet, daß die genannte zentrale Nabe (27) zum Hindurchlassen der Zentrierteile (15) des Zentrierelementes (14) mit Öffnungen (30) versehen ist.

Revendications

1. Dispositif pour le centrage, en fonctionnement, d'un disque à lire ou à enregistrer tandis qu'il est en rotation, ce disque présentant un trou central, le dispositif comprenant un plateau tournant (2, 25) qui, en fonctionnement, peut être entraîné en rotation autour d'un axe de rotation (1, 16) et plusieurs organes de centrage (9, 15) qui sont reliés au plateau tournant et qui, dans l'état opérationnel du disque, sont situés au moins partiellement dans le trou central de ce disque et peuvent chacun pivoter à l'encontre d'une sollicitation élastique, par leurs extrémités libres, en direction de l'axe de rotation autour d'un pivot qui s'étend au moins en substance tangentiellement par rapport à un cercle situé concentriquement autour de l'axe de rotation, caractérisé en ce que les organes de centrage (9, 15), à leurs extrémités (8, 17) éloignées de leurs extrémités libres, sont reliés à des bandes de liaison (11, 22) qui sont adjointes à ces extrémités et qui, depuis celles-ci, s'étendent en direction de l'axe de rotation (1, 16) ainsi que l'une vers l'autre, les extrémités des bandes de liaison éloignées des organes de centrage étant reliées l'une à l'autre.

2. Dispositif suivant la revendication 1, caractérisé en ce que chaque organe de centrage (9, 15) est relié à deux bandes de liaison (11, 22) qui sont disposées symétriquement par rapport à un plan passant par l'axe de rotation (1, 16) et par le centre de l'organe de centrage (9, 15) en question, les bandes de liaison qui ensemble sont les plus proches de deux organes de centrage successifs dans le sens circonférentiel étant reliées l'une à l'autre.

3. Dispositif suivant la revendication 1 ou 2, caractérisé en ce que les organes de centrage (9, 15) et les bandes de liaison (11, 22) sont fabriqués d'une seule pièce en une résine synthétique élastique pour former un élément de centrage (14).

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4. Dispositif suivant l'une quelconque des revendications précédentes, caractérisé en ce qu'une bande de liaison (11, 22) présente une section transversale rectangulaire, dont le long côté rectangulaire s'étend au moins en substance parallèlement à l'axe de rotation (1, 16).

5. Dispositif suivant l'une quelconque des revendications précédentes, caractérisé en ce qu'une extrémité de chaque organe de centrage (15) est reliée à un élément de liaison (17) qui s'étend concentriquement autour de l'axe de rotation et les éléments de liaison sont reliés, à l'aide d'une partie formant bride (18), à un anneau de support (19) s'étendant concentriquement par rapport à l'axe de rotation et entourant les éléments de liaison, tout ceci s'effectuant d'une manière telle que les éléments de liaison (17) avec les organes de centrage (15) puissent pivoter par rapport à l'anneau de support (19) autour de pivots imaginaires formés par la partie formant bride.

6. Dispositif suivant la revendication 5, caractérisé en ce qu'un trou (20) est prévu dans la partie formant bride (18) à l'endroit de chaque organe de centrage (15).

7. Dispositif suivant la revendication 5 ou 6, caractérisé en ce qu'au niveau de la zone des extrémités adjacentes d'éléments de liaison (17) supportant deux organes de centrage (15), une fente (21) est prévue dans la partie formant bride (18) et s'étend radialement depuis la circonférence intérieure de la partie formant bride (18).

8. Dispositif suivant l'une quelconque des revendications précédentes, caractérisé en ce qu'il comprend douze organes de centrage (15) prévus à des distances angulaires régulières les uns des autres.

9. Dispositif suivant l'une quelconque des revendications précédentes, caractérisé en ce que ledit élément de centrage (14) est relié au plateau tournant (25) de manière à être détachable.

10. Dispositif suivant la revendication 9, caractérisé en ce que le plateau tournant (25), sur son côté éloigné de la surface de support pour le disque, comprend un logement destiné à recevoir l'élément de centrage (14), des passages (30) situés à des distances réguliers les uns des autres étant prévus dans le plateau tournant pour le passage des organes de centrage (15) de l'élément de centrage (14) de telle façon que les extrémités libres des organes de centrage (15) s'étendent au-dessus de la surface de support.

11. Dispositif suivant la revendication 10, caractérisé en ce que le plateau tournant comprend un moyeu central (27) dont la partie qui s'étend au-dessus des extrémités libres des organes de centrage (15) est conique de telle sorte que le diamètre de cette partie augmente progressivement depuis l'extrémité du moyeu en direction des organes de centrage (15).

12. Dispositif suivant la revendication 11, caractérisé en ce que les extrémités libres des organes de centrage (15) sont situées dans la zone d'une partie du moyeu (27) du plateau tournant dont le diamètre extérieur n'est que légèrement inférieur au diamètre du cercle sur lequel les surfaces limites (24) des organes de centrage (15) en contact avec le bord du trou du disque sont situées de telle sorte que les extrémités libres des organes de centrage sont incorporées au moins en majeure partie dans des parties des passages (30) formés dans le plateau tournant et situés dans la circonférence extérieure du moyeu (27).

13. Elément de centrage (14) convenant pour un dispositif suivant l'une quelconque des revendications précédentes, comprenant un certain nombre d'organes de centrage (15) supportés par des éléments de liaison (17) qui peuvent pivoter autour d'un pivot imaginaire par rapport à un anneau de support (19), caractérisé en ce que les organes de centrage (15) sont réunis par des bandes de liaison (11, 22) et le pivot imaginaire est réalisé à l'aide d'une partie formant bride (18) située entre les éléments de liaison (17) et l'anneau de support (19).

14. Plateau tournant (25) propre à être utilisé en combinaison avec un élément de centrage (14) suivant la revendication 13, comprenant une pièce plate (26) reliée à un moyeu central (27), caractérisé en ce que le moyeu central (27) est pourvu d'ouvertures (30) pour le passage des organes de centrage (15) de l'élément de centrage (14).

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