

The invention relates to a receiving device, for a recording and/or reproduction apparatus, for the reception of discs of different diameters, which device includes a depression for receiving the disc having the greater diameter and the edge of which safeguards the disc of greater diameter from being displaced, wherein there is provided a recess in the centre of the depression for a lowerable bearing surface, wherein a disc is placed in the play-back position by lowering the bearing surface and wherein supports, which safeguard the smaller disc from being displaced and upon which the larger disc rests, are arranged on the bearing surface along the periphery of an imaginary circle whose diameter corresponds to the diameter of the smaller disc.

CD players or video disc players are equipped with e.g. receiving devices for the disc-shaped recording medium, the CD disc or the video disc.

For play-back purposes, a CD disc is centred in a CD player, pressed onto a turn-table and set in rotation. The centring of the CD disc is made easier by a receiving device into which the CD disc is inserted. This receiving device has a circular depression whose diameter is matched to the external diameter of conventional CD discs in such a way that, on the one hand, the CD disc can, apart from a certain amount of radial play, be pre-centralised, but, on the other hand, is freely rotatable for the purposes of play-back.

However, CD discs having a smaller format, so-called mini-CDs, cannot be sufficiently pre-centralised in the receiving device of a CD player such that they can be played-back without taking additional measures. In order, nevertheless, to be able to play-back mini-CDs in a conventional CD player using a receiving device for conventional CD discs, the mini-CD is firmly clamped into a ring-like disc which serves as an adapter whose external diameter corresponds to the external diameter of a conventional CD disc. The ring-like disc is inserted, together with the inlaid mini-CD, into the receiving device of the CD player and can then be played-back like a conventional CD disc.

However, this solution does not appeal to the keen player of CDs because he needs the aforesaid ring-like disc or a similar accessory for adapting to the smaller diameter when playing-back mini-CDs.

A further disadvantage can be seen in that a mini-CD has to be firmly clamped into the ring-like disc by hand before play-back, and, after being played-back, has to be removed in order to be able to clamp-in the next mini-CD.

A receiving device for a recording and/or reproduction apparatus for the reception of discs of different diameters is known from US-A 4 695 995. A recess is provided in the receiving device for a bearing surface which is lowered and lifted by means of a respective guide rail arranged on the left and right hand sides. The two guide rails arranged on the left and right hand sides of the bearing surface require a proportionately wide construction of the receiving device.

Thus, the object of the invention is to construct the receiving device of a recording and/or reproduction apparatus in such a way that a recording medium of smaller diameter can be inserted into the receiving device of the recording and/or reproduction apparatus without accessories and without any additional manual actions.

The invention achieves this object in that, the bearing surface is mechanically coupled to the receiving device by means of an arm, that the arm is rotatably mounted on the receiving device and on the bearing surface, that the arm (AR) is pressed downwardly for lowering the bearing surface and is pressed upwardly for raising the bearing surface and that there are at least three supports.

There is shown in

Figure 1 an embodiment of the invention from above

Figure 2 the embodiment from below

Figure 3 a side view of the embodiment

Figure 4 a side view of the embodiment

Figure 5 a side view of the embodiment

Figure 6 a side view of the embodiment.

The invention will now be described and explained with the help of the Figures.

An embodiment of the invention for a CD player is shown from above in Figure 1. The receiving device N has a circular depression V in the centre of which there is provided a square-shaped recess AS for the square-shaped bearing surface L. The square-shaped recess AS is open at the rear so that an approximately U-shaped recess is formed. An approximately U-shaped recess is likewise provided on the same side in the receiver N. These two U-shaped recesses U are provided for the drive means for the disc and the scanning device of the CD player.

Four supports S are arranged on the bearing surface L along the periphery of an imaginary circle whose diameter corresponds to the external diameter of a mini-CD in such a way that one support S is located at each corner of the bearing surface L. A mini-CD is placed between the four supports S while a normal CD disc rests on the four supports S. The position of the discs is apparent from the Figures 3 to 5.

Figure 2 shows the embodiment from below. The bearing surface L is mechanically coupled to the receiving device N by means of an arm AR. The arm AR is rotatably mounted at the mounting points P1, P2, P3 and P4 so that it can be pressed upwardly and downwardly.

A toothed rack ZS having a guide groove F, in which a gudgeon pin Z of the arm AR is guided, is located near the bearing surface L. The arm AR is pressed upwardly and downwardly by forward movements and backward movements of the toothed rack ZS e.g. by means of a toothed gear driven by an electric motor. The lifting movement is limited upwardly by a respective stop A1 and A2 on the two legs formed by the U-section and by a stop A3 at the front.

The manner in which the lifting and lowering movements of the bearing surface L occur will be explained with the help of the side-views shown in Figure 3 to 6.

The loading position of the bearing surface L is represented in Figure 3. For the purposes of illustration, both a CD disc CD of normal size, which rests on the supports S, and a mini-CD M, which is located between the supports S, is depicted. In the play mode, either only a CD disc of normal size or a mini-CD is located in the receiving device N. The stops A1, A2 and A3 of the bearing surface L abut the receiving device N.

The arm AR is moved downwardly in Figure 4. The bearing surface L does not rotate relative to the arm AR because of the friction at the mounting points P1 and P2. Consequently, the stops A1 and A2 initially abut against a contact surface of the housing of the CD player. The arm AR may be constructed such that the stop A3 abuts the arm AR simultaneously with the stops A1 and A2. The bearing surface L is of course not yet parallel to the receiving device N but it is already possible for an inserted CD disc or mini-CD to be engaged by the disc drive means and played back.

However, the arm AR may for example be so constructed that it does not touch the stop A3. If the arm AR is then pressed further downwardly, the bearing surface L rotates in the direction of the arrow about the bearing point of the stops A1 and A2 until eventually the stop A3 also rests on the contact

surface of the housing. The inserted CD disc CD or mini-CD is now likewise located in the play-back position. This position is shown in Figure 5.

The end of the rotational movement of the arm AR can also be determined by the shape of the guide groove F in the toothed rack ZS. The stops A1, A2 and A3 then only serve for rotating the bearing surface L into the play-back position. The bearing surface L is lifted by the arm AR for removing the CD disc from the receiving device N. The stops A1 and A2 once more initially abut against the receiving device N, as is illustrated in Figure 5, because of the friction at the mounting points P1 and P2. It is only when the arm AR is lifted further that the bearing surface L is rotated sufficiently in the direction of the arrow about the interconnecting axis of the stops A1 and A2 that the stop A3 likewise abuts against the receiving device N.

One substantial advantage of the mechanism for lowering the bearing surface L can be seen in that the very limited space which is available in a CD player is fully utilised. Due to the arm AR which mechanically couples the bearing surface L to the receiver N, it is not necessary to reduce the dimensions of other components.

The receiving device N may be constructed for example as an extendible and retractable drawer. For extracting the inserted disc and for inserting a new disc, the drawer is withdrawn from the housing of the CD player and thereafter is retracted into the housing for playing back the inserted disc.

Claims

1. Receiving device (N), for a recording and/or reproduction apparatus, for the reception of discs (CD, M) of different diameters, which device includes a depression (V) for receiving the disc (CD) having the greater diameter and the edge of which safeguards the disc (CD) of greater diameter from being displaced, wherein there is provided a recess (AS) in the centre of the depression (V) for a lowerable bearing surface (L), wherein a disc (CD, M) is placed in the play-back position by lowering the bearing surface (L) and wherein supports (S), which safeguard the smaller disc (M) from being displaced and upon which the larger disc (CD) rests, are arranged on the bearing surface (L) along the periphery of an imaginary circle whose diameter corresponds to the diameter of the smaller disc (M), characterised in that, the bearing surface (L) is mechanically coupled to the receiving device (N) by means of an arm (AR), that the arm (AR) is rotatably mounted on the receiving device (N) and on the bearing surface (L), that the arm (AR) is pressed downwardly for lowering the bearing surface (L) and is pressed upwardly for raising the bearing surface (L) and that there are at least three supports (S).
2. Receiving device in accordance with Claim 1, characterised in that, the lifting and lowering movement of the bearing surface (L) is limited by stops (A1, A2, A3).
3. Receiving device in accordance with Claim 1 or 2, characterised in that, a gudgeon pin (Z) of the arm (AR) is guided by a guide groove (F) of a toothed rack (ZS) that runs parallel to the arm (AR).
4. Receiving device in accordance with Claim 3, characterised in that, the toothed rack (ZS) is moved by means of a toothed gear driven by an electric motor.
5. Receiving device in accordance with any of the Claims 1, 2, 3 or 4, characterised in that, a recess (U) is provided in the bearing surface (L) for the disc drive means and the scanning device of the recording and/or reproduction apparatus.
6. Receiving device in accordance with any of the Claims 1, 2, 3, 4 or 5, characterised in that, the bearing surface (L) and the recess (AS) provided for it in the receiving device are circular or square shaped.
7. Receiving device in accordance with any of the Claims 1, 2, 3, 4, 5 or 6, characterised in that, the receiving device (N) is formed as a drawer which can be retracted into the housing and extended out of the housing of the apparatus.

