

A TWIN DISC PLAYER

This invention relates to a twin disc player, and particularly to a twin disc player which has a disc holder for securing the discs during playing and a door which may be opened and shut.

Generally, the disc is played after loading the disk on a turntable and holding the disc by means of a disc holder, and thereafter driving the turntable and a pickup. Motors are used as power sources to drive the turntable and pick-up, operate the door and operate the disc holder.

However, the conventional disk player with the above mentioned configuration loads only a single disc on the turntable to reproduce the recording on the disc. Recently, there has been demand for a twin system in which two discs are simultaneously loaded on one disc player and each disc is selectively driven as needed. In this respect, the twin system has been partly developed to satisfy the customers' desires.

The conventional twin disc player comprises a pair of turntables, two motors for separately operating the turntables, a motor for opening and shutting the door, and a motor for driving the pickup, wherein each of said four motors has a characteristic operation which is consecutively performed.

Each operating time of said motors has to be

adequately established, but the establishment of the proper time is very difficult and additional devices are required to drive said four motors. Accordingly, the above configuration causes the disc player to be complex and the volume thereof to be large. Further, there is the problem that it is difficult systematically to drive each of said motors and to smoothly run the disc player.

According to the invention there is provided a twin disc player comprising a pair of turntables each having a respective drive motor, a single reversible driving motor, a disc holder opening and shutting means, a door opening and shutting means and operating means moveable by the reversible motor to operate the two opening and shutting means.

An example of the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a twin disc player.

Fig. 2 is a plan view illustrating the assembled state of the twin disc player.

Fig. 3 is a plan view illustrating the state in which a door is just about being opened.

Fig. 4 is a plan view illustrating the state in which the door is opened.

Fig. 5(A) is a side view illustrating the state in which a disc holder is mounted on a turntable.

Fig. 5(B) is a side view illustrating the state in which the disc holder is detached from the turntable.

A twin disc player comprises a chassis 1, a disc holder 23 hinged to the chassis at 24 and a door 20 slidably mounted on the chassis. Figures 1 and 2 show the door fully closed, figure 3 shows the door in a slightly open position and figure 4 shows the door more fully open. Figure 5A shows the disc holder 23 closed and figure 5B shows it open; opening is caused by engagement of a cam follower 25 on the underside of the holder 23 engaging a cam 14 on a rotatable pinion 13.

The chassis 1 has twin turntables 2 and 4, each with a respective driving motor 3 and 5. A pickup carriage 7 is movable transversely between the turntables along parallel rails 6 and 6a by a driving rack 9. A moving rack 8 is fixed for linear movement with the rack 9, the teeth of the racks 8 and 9 engaging a pinion 15 which is driven through a chain of gears 15a, 16, 19 and 19a by a single reversible driving motor 18. Gear 19a also drives a the pinion 17a through a further chain of gears 17 and 19b and the pinion can engage rack 21 on the door 20, but is out of engagement when the door 20 is fully closed, as shown in figures 1 and 2. The rack 8 engages the sprocket wheel 13 only at the end of its travel (to the left as see in fingure 1), causing the spocket to rotate and the cam 14 to engage the follower 25 to lift the holder about its hinge 24. The rack 8 has at the end (to the left as seen in figure 1) a pivoted lever to which can engage a holder guide 11 which when so engaged

allows the holder 23 to be opened, but otherwise locks it shut. Below the lever 20 is a pushing member 8a which can engage a pivoted lever 12, whose other arm can engage a shoulder 22 on the door 20.

In the playing condition of the player as shown in figures 1 and 2, the rack 21 is disengaged from the pinion 17a and the rack 8 from the sprocket 13. The racks 8 and 9 remain remote from the left-hand end of their travel as the motor 18 drives the pick-up carriage 7 and the appropriate motor 3 or 5 drives the corresponding turntable 2 or 4 so that a recording on a disc on that turntable can be reproduced. When the reproduction phase is complete, motor 18 drives the rack 8 to the left-hand end of its travel. As it does so, the sprocket 13 is rotated to engage the cam 14 with the follower 14 and the lever 10 engages the guide 11. The holder is thus unlocked by the guide 11 and is hinged open by the cam 13. As the rack 8 approaches the end of its travel, the pushing member 8a engages the lever 12 which pivots so that one cam engages the shoulder 22 and opens the door 20 slightly, thus causing the rack 21 to engage the pinion 19a. The rack 8 is now clear of the pinion 15, so that continued rotation of the motor 18 simply opens the door 20 until it is fully open when the rack 21 moves clear of the pinion 19a.

The discs have been released by the holder 23 and drawn out on the door 20 and can easily be replaced.

The new discs are pushed back into the player on the door 20 until the rack 21 re-engages the pinion 17a which is now driven in the reverse direction by the motor 18 until the shoulder 22 engages the lever 12. The lever 12 causes the rack 8 to re-engage the pinion 15 so that the rack 8 is pulled back to the right, rotating the sprocket 13 to clear the holder 23 which is then locked by the removal of the lever 10 from the guide 11. As the lever 12 is rotated by the shoulder 22, the rack 21 clears the pinion 17a, stopping the closing action of the door 20. When the rack 8 clears the sprocket 13, the motor 18 can be controlled, in conjunction with the motors 3 and 5, to reproduce the recordings on the new discs.



CLAIMS

1. A twin disc player comprising:
 - a pair of turntables each having a respective drive motor;
 - a single reversible driving motor;
 - a disc holder opening and shutting means;
 - a door opening and shutting means; and
 - operating means moveable by the reversible motor to operate the two opening and shutting means.
2. A player as claimed in claim 1, wherein the disc holder opening and shutting means is rotatable to open and shut a disc holder.
3. A player as claimed in claim 1 and claim 2, wherein the operating means comprises a pair of racks for movement together, one rack for driving the holder opening and shutting means and the other for selectively driving a pick-up for discs on the turntables.
4. A player as claimed in any one of claims 1 to 3, wherein the holder opening and shutting means comprises a cam and cam follower.
5. A disc player as claimed in any one of the preceding claims wherein the operating means comprises a rotatable



member for slightly moving the door towards an open position, the player further comprising a rack connected to the door which moves into driving engagement with the reversible driving motor when said door makes said slight movement towards the open position.

6. A disc player substantially as herein described with reference to the accompanying drawings.
