

DESCRIPTION

The invention relates to a device in the auto-reverse deck of a magnetic-tape-cassette apparatus, in which the magnetic tape is passed along at least one magnetic recording/playback head which is arranged on a pivotable head-mounting plate which is movable towards
5 the magnetic tape and which by a controlled pivotal movement positions always one of the two pressure rollers arranged on it against the associated capstan and thereby defines the direction of tape transport.

Such a device is known from the tape deck Grundig, WKC 3 3857 VD. The known apparatus employs a reversible motor and drive
10 system which rotates control discs provided with projections. Depending on the position of these projections on the control discs the head-mounting plate, as it travels towards the cassette, can abut with projections which are situated at different distances from the front wall of the cassette, so that the relevant pressure roller, which takes
15 over the tape-transport, is pressed against the magnetic tape.

The use of a reversible drive system for controlling the head-mounting plate is more intricate than the use of a non-reversible drive system. In principle, a non-reversible motor is not suitable for
20 realising the known pivoting mechanism.

It is the object of the invention to provide a device in the auto-reverse deck of a magnetic tape apparatus, by means of which device the pivotal position of the head-mounting plate is again determined by the head-mounting plate itself as it moves towards the
magnetic tape.

25 According to the invention this object is achieved in that guide slot systems arranged on the tape-deck chassis on both sides of the magnetic head, guide pins which are arranged on the head-mounting plate and which can move in the guide slot systems towards an imaginary capstan connecting line, control means which cooperate with
30 the guide-slot systems and which guide the guide pins in the guide-slot systems in such a way that, after each movement of the head-mounting plate away from the connecting line, during a subsequent movement

towards the connecting line the guide pins alternately move in the one or the other guide-slot system into a guide slot branch which blocks the travel of the relevant guide pin, so that that pressure roller on the pivoting head-mounting plate can move towards the associated capstan whose associated guide pin meets a path which is not blocked.

The principal advantage of this device is that the head-mounting plate itself, as it moves away from the cassette and travels forwards again towards the cassette, mechanically positions stops, which is achieved by the cooperation of the guide pins with parts of the guide-slot system. The control means ensure that the stop changes mechanically from one side to the other side in a reliable manner, so that always only one pressure roller of the head-mounting plate can be applied alternately to the associated capstan. A further advantage of this device is that the movement of the head-mounting plate and the alternate application of the pressure rollers to the capstans can be obtained by means of a non-reversible drive system, enabling the drive system to be manufactured more economically.

In another embodiment of the invention, the guide-slot systems comprise fork-shaped guide slots in the tape-deck chassis, which slots comprise two branches corresponding to the fork tines, one of the branches being shorter than the other and the shorter (or longer) branches both being situated either nearer one another or remote from each other, and in that a central run-in branch which corresponds to the fork handle opens into the trough-shaped fork base.

In this way the only part which dictates the pivotal direction of the head-mounting plate is the control plate, which may be a flat stamped part having only a small height. Therefore, this construction is very suitable for use in equipment of a flat construction, such as for example car cassette players. The guide pins may be constructed simply as thumb-tack shaped limbs or as elastic tongues on whose free ends pin-shaped projections are arranged. The smaller distance between the branches of the U-shaped slots in the control plate ensures that the guide pins, which engage with the run-in branches when the head-mounting plate is withdrawn, always meet the tongues of the control plate in the laterally offset position, so that a correct control in the desired direction is obtained.

In another embodiment of the guide slot systems and the

control means that the guide-slot systems comprise U-shaped grooves formed in the tape-deck chassis, which grooves each have a short and a long branch and a double groove at the base connecting the branches, and in that the control means comprise raised guide surfaces on the groove bottoms and guide portions in the area of the groove bottom, which after each withdrawal and subsequent forward movement of the head-mounting plate only allow the guide pins to move via one of the base grooves from the short branch into the long branch and during the next backward and forward movement to move via the other base groove from the long into the short branch, the short and the long branches being so arranged that upon each backward and forward movement one of the guide pins moves into a short branch, whilst the other guide pin moves into the long branch, and during the subsequent backward and forward movement said guide pin moves into the long and the other into the short branch. These guide slots systems and control means do not require the use of any moving control means. The control means in the form of raised guide surfaces and guide portions can be formed integrally with the deck plate by injection-moulding, for example by outsert-moulding. The only movable elements are the guide pins on the head-mounting plate.

In a further embodiment of the invention, the control plate is provided with at least one stop and in that the apparatus comprises a stop button and a rod which is connected to said button, which rod is provided with a projection which upon actuation of the stop button abuts against the stop and always moves the control plate into one of its end positions. This results in a preferred position of the control plate, so that after actuation of the stop button the magnetic tape is always moved in only one of the two directions of tape transport. In the case of a car cassette player the stop button may also function as eject button, which ensures that the tape is always driven in one specific tape-transport direction after depression of the eject button, removal of the cassette which has been played and insertion of a new cassette.

Embodiments 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 a view of the magnetic-tape-cassette apparatus

from the driving side,

Fig. 2A is an enlarged-scale perspective view of a latching mechanism of the apparatus in a first position,

5 Fig. 2B shows the latching mechanism of Fig. 2A in a second position,

Fig. 3 shows the magnetic-tape-cassette apparatus from the magnetic-head side in a playing mode with a first tape-transport direction,

10 Fig. 4 shows the magnetic-tape-cassette apparatus from the magnetic-head side in a tape-transport direction opposite to that in Fig. 3,

Fig. 5 is an exploded view which shows how a guide-slot system cooperates with control means and a head-mounting plate,

15 Fig. 6 shows the various positions of a control plate for controlling the guide-slot system and the head-mounting plate,

Fig. 7 is a perspective view of the control plate and a stop button which cooperates with this plate to define a preferred tape-transport direction,

20 Fig. 8 shows a second embodiment of the guide-slot system and the control means for pivoting the head-mounting plate.

The magnetic-tape-cassette apparatus in accordance with the invention, as shown in Fig. 1, comprises a deckplate 1 which carries a non-reversible drive motor 3 via a support 2. The drive pinion 4 of the motor 3 guides a belt 5, which is passed over flywheels 7 and 8 via a guide roller 6 in such a way that the flywheels rotate in opposite directions. The flywheels 7 and 8 are journaled in the deckplate 1. The flywheel 7 is rigidly connected to a capstan 9 and the flywheel 8 is rigidly connected to a capstan 10. Moreover, the flywheel 7 is connected to a gear wheel 11 and the flywheel 8 is connected to a gear wheel 12. Via a friction clutch a further gear wheel 13, coaxial with the gear wheel 12, is rotatably mounted on the flywheel 8. A switching wheel 14 in the form of a gear wheel is constantly in mesh with the gear wheel 12 on the flywheel 8. This gear wheel 14 is arranged to be pivotable about a spindle 15. The spindle 15 carries a pivotal arm 16, shown schematically in Fig. 1, on which the switching wheel 14 is mounted for rotation. In a similar way a gear wheel 17 is constantly in mesh with the gear wheel 11. This gear wheel 17 is arranged to be

pivotable about a spindle 18 by means of a pivotal arm 19, which is shown schematically.

As is also shown in Figs. 3 and 4, winding spindles 20 and 21 are rotatably journaled in the deckplate 1. These winding spindles 20 and 21 are rigidly connected to fast-wind wheels 22, 23. Via friction clutches play wheels 24, 25 are coupled to the winding spindles 20, 21.

Fig. 3 shows how the play wheel 25 is driven by the gear wheel 12 via the switching wheel 14. In a similar way Fig. 4 shows how the play wheel 24 is driven by the gear wheel 11 via the gear wheel 17.

A member 26, which is slidably supported in the deckplate 1, carries two gear wheels 28, 29 adjacent each other (see Fig. 1). A spring 30 always urges the member 26 into an initial position shown in Fig. 1.

The member 26 carries two pins 28a, 29a, which are movable in a triangular hole 28b and a slot 29b, respectively, in the deckplate 1.

For fast forward and reverse winding there are provided two buttons 31 and 32. These buttons 31, 32 are connected to slides 35, 36 via push-button rods 33 and 34. These slides 35 and 36 cooperate with the member 26. For this purpose the slide 35 is formed with a projection 37 and the slide 36 is formed with a run-on surface 38. The projection 37 and the run-on surface 38 cooperate with a pin 39 of the member 26. The slides 35, 36 further comprise run-on surfaces 35a, 35b and 36a, 36b, respectively, which can operate on pins 74c, 74d of a head plate 74 (see also Figs. 1, 3, 4).

When as a result of the depression of the fast-wind button 31 the projection 37 is urged against the pin 39 on the member 26, the gear wheel 29 first meshes with the gear wheel 13. The pin 28a then moves in the direction indicated by the arrow b and the pin 29a in the direction indicated by the arrows c'. As the movement continues, the pin 29a moves further in the direction indicated by the arrow b', as a result of which the gear wheel 29 also meshes with the gear wheel 23. The magnetic tape is now wound rapidly by the winding spindle 21. If the other fast-wind button 32 is depressed the run-on surface 38 acts on the pin 39 of the member 26, so that the pin 28a moves in the direction indicated by the arrows c and the pin 29a in the direction

indicated by the arrow c', causing the gear wheel 29 to mesh with the gear wheel 13 and the gear wheel 28 with the gear wheel 22. In this way the other winding spindle 20 is now driven for fast winding.

When the head-mounting plate 74 has reached a playing
5 position, the pins 74c, 74d assume one of the broken-line positions shown in Figure 1. The positions correspond to the positions shown in Figures 3 and 4, respectively. Actuating the push-button rods 33 and 34, has for its result that via the run-on surfaces 35a, 35b and 36a, 36b, respectively, the pins 74c, 74d and hence the head-mounting plate
10 74 are moved to the left, so that a sound head 75 and pressure rollers 78, 79 are lifted off the magnetic tape.

A detection means 40, comprising two discs 41, 42 and a connecting rod 43, is connected to the winding spindles 20, 21 via friction clutches. A pin 44 arranged on the disc 42 engages with a
15 switching fork 45. The switching fork 45 is arranged on a switching member 46, which is pivotable about a pivot 47 (see also Figs. 2A and 2B). The switching wheel 14 carries a central slightly elliptical projection 48. The switching member 46 extends over the switching member 46 has pivoted inwards, can move around the projection 48 when
20 the switching wheel is rotated in the direction indicated by an arrow 50. Around the projection 48 a spiral cam surface 51 is formed on the switching wheel 14 at a comparatively large distance. This cam surface 51 can also cooperate with the pin 49 on the switching member 46, namely when the detection means detects tape stoppage. The pin 44 then
25 no longer urges against the switching fork 45, so that the pin 49 on the switching member 46 is no longer moved inwards towards the projection 48 but remains in the same position and, as the switching wheel 14 continues to rotate in the direction indicated by the arrow 50, reaches the outer side of the cam surface 51. Since the cam surface
30 51 is spiral-shaped the switching member 46 will be pivoted clockwise about its pivot 47, so that the switching member 46 is urged against a connecting member 52.

The connecting member 52 is a lever having two arms, which lever is pivotable about a pivot 53. As can be seen in Figs. 2A and 2B,
35 the connecting member 52 is spring-biased in the clockwise direction by a spring 54. Thus, the movement of the switching member 46 tensions the spring 54.

The lever arm 55 of the connecting member 52, which arm is remote from the point of engagement with the switching member 46, carries a heart-shaped projection 56 which forms part of a latching mechanism 57. The latching mechanism 57 also comprises a latching lever 58, which can be pivoted about a spindle 59. The spindle 59 extends parallel to the upper surface of the deck plate 1 and to an imaginary connecting line a between the capstans 9 and 10. The latching lever 58 carries a guide pin 60 on its side which faces the heart-shaped projection 56, which pin extends through a guide slot 61 in a rod 62 of a stop/eject button 63. The guide slot 61 has such a shape that the latching lever 58, as can be seen in Fig. 2B, is pivoted about the spindle 59 in the direction indicated by an arrow 64 when the stop/eject button is released. The outward movement of the stop/eject button 63 and the rod 62 is obtained in a manner, not shown, by inserting a magnetic-tape cassette into the apparatus. Fig. 2A shows the rod 62 in the inward position and Fig. 2B shows the rod 62 in the outward position.

The latching lever 58 carries a latching pin 65, which can engage in and pass around the heart-shaped projection 56. This is achieved by means of, for example, an integral hinge 66. In Fig. 2A the pin 65 is situated above the heart-shaped projection 56, because the rod 62 is depressed. In Fig. 2B, in which the rod 62 has moved outwards, the pin 65 is positioned in the area where it can engage with the heart-shaped projection 56. The pin 65 can then cooperate with the heart-shaped projection 56 when the switching member 46 pivots the connecting member 52 in the anti-clockwise direction indicated by an arrow 67, as shown in Fig. 2B. During this pivotal movement the pin 65 has moved past a side wall 68 of the heart-shaped projection 56. A guide 69 ensures that the pin 65 engages a recess 70 in the heart-shaped projection 56.

The lever arm 55 carries a limb 71. As can be seen in Figs. 3 and 4, this limb 71 cooperates with a leaf spring 72 and extends through a slot 23 in the deck plate 1. With its free ends the leaf spring 72 acts against members 76, 77 which are pivotally journaled on the head-mounting plate 74. In its centre this head-mounting plate 74 carries a sound head 75 and on each side of the sound head 75 one of the members 76, 77 in which the pressure rollers 78, 79 are

journalled. The members are urged against stops 74a, 74b on the head-mounting plate 74.

The head-mounting plate 74 has angular end-portions 80, 81. The end portion 80 is formed with a slot 82, in which a pin 83 is movable, which pin is mounted on the pivotal arm 16. Thus, in the position shown in Fig. 3, the pivotal arm 16 has pivoted about the spindle 15 in such a manner that the switching wheel is in mesh with the play wheel 25 and the gear wheel 12. In a similar way Fig. 4 shows that the end portion 81 of the head-mounting plate 74 has pivoted the pivotal arm 19 about the spindle 18, so that the gear wheel 17 is in mesh with the play wheel 24 and the gear wheel 11. Moreover, in the position shown in Fig. 3 the pressure roller 79 is urged against the capstan 10 and in the position shown in Fig. 4 the pressure roller 78 is urged against the capstan 9.

In the head-mounting plate 74 slots 84, 85 are formed, which slots extend parallel to the connecting line between the capstans 9, 10, guide pins 86, 87 being movable in these slots.

The exploded view in Fig. 5 shows the guide pins 86, 87 which are guided in the slots 84, 85 in the head-mounting plate 74. Thus, the guide pins can be moved parallel to the connecting line a between the capstans. How the guides 86, 87 are retained in the head-mounting plate 74 is not shown. A simple construction is to secure the guide pins to a cap in the same way as the pin of a thumbtack. However, alternatively, the guide pins may be arranged on the free ends of resilient tongues which are secured to the head-mounting plate 74.

A control plate 88, which serves as the control means, is arranged between the head-mounting plate 74 and the upper side of the deckplate 1. This control plate 88 is formed with longitudinal slots 89, 90 through which projecting guides 91, 92 on the deck plate extend. As a result of this, the control plate 88 is movable parallel to the imaginary connecting line a between the capstans 9, 10. In Fig. 5 this movement is indicated by a double arrow 93.

On both ends a control plate 88 is formed with U-shaped slots 94, 95. The U-shaped slots 94 and 95 each have a short branch 96, 97 and a long branch 98, 99. The short branches are remote from each other and the long branches are disposed closer to each other. The connecting portions 100 and 101 between the short and the long branches

are substantially wider. Between the long and short branches tongues 102 and 103 are formed, which tongues have pointed ends which face the connecting portions 100, 101.

5 Fork-shaped guide slots 104 and 105, which constitute a guide-slot system, are formed in the deck plate 1, which slots each comprise two branches corresponding to the fork tines, one branch 106, 107 being shorter than the other branch 108, 109. A central run-in branch 110, 111 opens into the trough-shaped fork base 112, 113. The distance 114 between the branches of the U-shaped guide slots 94, 95 in 10 the control plate 88 is smaller than the distance 115 between the lateral branches of the fork-shaped guide slots 104, 105.

Fig. 7 shows the control plate 88 in a perspective view of the deck plate 1. The control plate 88 is provided with a stop 116 with which a projection 117 of an intermediate slide 118 can abut, which 15 slide can be moved parallel to the imaginary connecting line a between the capstans 9 and 10. The intermediate slide 118 is provided with two stops 119, 120, against which the stop-button rod 162, which also serves as ejector, can be urged by an actuating member 121. If the stop button 63 with its rod 62 has moved outwards it has moved the 20 intermediate slide 118 outwards because the actuating member 121 has abutted against the stop 120. As a result of this, the projection 117 is clear of the stop 116. Thus, the control plate 88 can move freely in the direction indicated by the double arrow 93 in Figs. 5 and 7. However, when the stop/eject button 63 is depressed the actuating 25 member 121 abuts against the stop 119 and the projection 117 abuts against the stop 116. This defines a preferred position of the control plate 88, as shown in Fig. 6B.

The device operates as follows: When a cassette is inserted the eject button 63 moves from the position shown in Fig. 2A to the 30 position shown in Fig. 2B. In a manner, not shown, the switch of the motor 3 is closed and the motor is started. As a result of this, the flywheels 7 and 8 begin to rotate in opposite directions. At the same time the gear wheels 11 and 12 and the gear wheels 14 and 17 with which they mesh are rotated.

35 As a result of the movement of the eject rod 62 the latching lever 58 is pivoted about the spindle 59, as shown in Fig. 2A, and the latching pin 65 is positioned in the area of engagement with the

heart-shaped projection 56, as shown in Fig. 2B.

As the gear wheels 14 and 17 are not in mesh with the gear wheels 24 and 25, the two winding spindles 20 and 21 are not driven. The discs 41 and 42 are coupled to the windings spindles 20, 21 via separate friction clutches and are therefore also stationary. Since no torque is exerted on the switching member 46 when the cassette is inserted, because the reels do not rotate and there is no tape transport, the switching member 46 remains in the position shown in Fig. 1 and the pin 49 is moved against the outer side of the control cam 41. As a result of this, the switching member 46 is moves in a clockwise direction, as indicated by the arrow 46a, and the connecting member 52 is pivoted anticlockwise (arrow 67). Since the latching lever 58 has pivoted and the pin 65 is positioned in the area of engagement with the heart-shaped projection 56, the pint 65 now travels around the wall 68 of the heart-shaped projection 56 and engages the recess 70. Thus, the connecting member is latched in a pivotal position (see Fig. 2B).

Owing to the pivotal movement of the connecting member 52 in the anticlockwise direction indicated by the arrow 67, the limb 71 has moved inwards and is urged against the leaf spring 72. The leaf spring in its turn acts against the head-mounting plate 74 via the members 76 and 77 and tends to urge this plate towards the capstans 9, 10. Now the action of the control plate 88 manifests itself.

Prior to the inward pivotal movement of the limb 71 the head-mounting plate 74 is clear of the capstans. As a result of this, the guide pins 86, 87 have engaged the run-in branches 110 and 111 (see Fig. 5). The control plate 88 has assumed the position shown in Fig. 6A. When the head-mounting plate 74 is moved towards the capstans 9, 10 the guide pins 86, 87 move forwards and abut against the left-hand sides of the tongues 102, 103 to run into the left-hand branches 106 and 109 of the fork-shaped guide slots 104, 105. When the guide pins 86, 87 move into the branches 106 and 109 said guide pins 86, 87 move the control plate 88 to the left, so that the branches 96, 106 and 99, 109 now coincide. The left-hand guide pin 86 is then retained in the shorter branch, whilst the right-hand guide pin 87 can move freely towards the capstan 10 (see Fig. 6B). As a result of this, the advanced head-mounting plate 74 swings forwards towards the right, in such a way

that the right-hand pressure roller 79 is applied to the right-hand capstan 10. The other capstan remains free. Consequently, the tape runs in the direction indicated in Fig. 3.

5 When the end of the tape is reached the tape stops. As a result of this, the switching member 46 with its pin 49 is again pivoted outwards in the clockwise direction. As a result of this, the connecting member 52 is again pivoted anticlockwise (Fig. 2B) in the direction indicated by the arrow 67. During this movement the connecting member 52 is pivoted beyond the normal travel obtained when
10 in the latched position. This overtravel is possible because the limb 71 acts against the leaf spring 72 on the head-mounting plate 74 via the levers 76, 77 and thus has room for a movement towards the head-mounting plate. During this overtravel the pin 65 leaves the recess 70 and the latching mechanism 57 is released. Under the
15 influence of the spring 54 the released connecting member 52 is now pivoted clockwise, so that the limb 71 moves outwards. In this position the head-mounting plate has moved outwards and the guide pins 86, 87 again engage the run-in branches 110 and 11. The control plate 88 remains in its last position. The tongues 102 and 103 thus remain in a
20 position to the left of the centre of the run-in branches 110 and 11 (Fig. 6C).

Now the reversal begins. The switching wheel 14 continues to rotate. Since the head-mounting plate 74 has moved backwards its bent end portion 80 has moved outwards and thereby moved the pivotal arm 16
25 in such a way that the switching wheel 14 is no longer in mesh with the play wheel 25. Thus, the play wheel 25 is no longer driven. The detection means 40 then detect tape stoppage. Again the switching member 46 is pivoted clockwise. The switching member 46 presses against the connecting member 52 and pivots the latter again anticlockwise in
30 the direction indicated by the arrow 67. As a result of this, the pin 65 again moves around the heart-shaped projection 56 and finally engages the recess 70, thereby latching the connecting member 52. The limb 71 has now moved forwards again and the head-mounting plate 74 occupies the position shown in Fig. 4 after the forward movement. Via
35 the bent end portion 81 of the head-mounting plate 74 the gear wheel 17 comes into mesh with the gear wheel 11 and with the play wheel 24. In this position, shown in Fig. 4, the pressure roller 78 is applied to

the capstan 9 and the tape runs in the opposite direction.

The reversal of the direction of tape transport is achieved by means of the system of guide slots which is shown in various positions in Fig. 6. The last position described is the position shown in Fig. 6C. In this position the control plate 88 has been moved to the left and the guide pins 86, 87 engage in the run-in branches 110 and 111. Since the head-mounting plate 74 is moved forwards again, the guide pins 86, 87 are also moved forwards and abut with the right-hand oblique surfaces of the pointed tongues 102 and 103. Consequently, the guide pins 86, 87 are moved to the right and can move further into the branches 108 and 107. The transverse movement of the guide pins 86, 87 is possible owing to the sliding movement of the guide pins 86, 87 in the slots 84, 85. When the guide pins 86, 87 engage in the branches 107 and 108 these pins have moved the control plate 88 so far to the right that the branches 108, 98 and 107, 97 coincide. As a result of this, the tongues 102, 103 are again positioned so that when the guide pins again move backwards and forwards they can abut with the left-hand oblique surfaces of the tongues 102 and 103. This position of the system of guide slots is shown in Fig. 6D. The guide pin 87 is retained in the shorter branches 107 and 97, which prevents the head-mounting plate 74 from moving further to the right. On the left-hand side the guide pin 86 can move freely in the branches 108 and 98, so that on the left-hand side of the head mounting plate 74 the spring 72 can urge the pressure roller 78 against the capstand 9. This position is shown in Fig. 4.

Fig. 8 shows a modified version of the guide-slot system and the control means. The guide-slot system comprises U-shaped grooves 122, 123 formed in the deck plate 1. The U-shaped grooves again cooperate with the guide pins 86, 87. The U-shaped grooves 122 and 123, in a similar way as in the versions shown in Figs. 5 and 6, comprise long branches 124, 125 and short branches 126, 127. The connecting portions between the relevant branches are formed as double grooves 128a, 128b and 129a, 129b. Near these double grooves 128 and 129 there are provided guide surfaces 130, 131 and 132, 133 which serve as control means. The guide surfaces 130 to 133 are formed as oblique run-on surfaces which gradually ascend from the bottom of the grooves until they terminate in the guide portions 130a, 131a, 132a and 133a.

These guide portions also belong to the control means for the guide pins 86 and 87.

The guide slot systems and control means shown in Fig. 8 operate as follows: It is assumed that the head-mounting plate 74 is withdrawn. In this initial position the guide pin 86 is situated in a recess 134 of the upper double groove 128b. The guide pin 87 is situated in a recess 135 of the lower double groove 129a. Above the guide pins groove walls with guide points 136b and 137a are provided. These guide points are offset relative to the centres of the guides pins 86, 87, to the left for the lower groove and to the right for the upper groove. Thus, if the head-mounting plate 74 is moved forwards again the guide pins can only move to the left over the guide surface 130 for the upper groove and to the right over the guide surface 133 for the lower groove. This means that during this movement the guide pin 86 moves into the shorter branch 126 and the guide pin 87 into the longer branch 125. Thus, the guide pin 86 meets a stop after a short travel, whilst the guide pin 87 can move freely. This corresponds to the position of the head-mounting plate 74 as shown in Fig. 3. If the head-mounting plate 74 is moved back again, the guide pin 86 moves through the branch 126 into the lower groove 128a and the guide pin 87 into the upper groove 129b. In the fully withdrawn position the guide pin 86 therefore engages a recess 138 indicated by broken lines in Fig. 8 and the guide pin 87 engages a recess 139. If the head-mounting plate is again moved towards the capstans the guide pin 86 moves towards the guide surface 131 in the long branch 124. The guide pin 87 moves towards the guide surface 132 in the short branch 127. This means that in the present case the guide pin 87 meets a stop in the short branch 127 after a short travel, whilst the guide pin 86 can move freely in the branch 124. The head-mounting plate then assumes a position as shown in Fig. 4. When the head-mounting plate 84 is withdrawn again the guide pins 86 and 87 return to the initial position described first.

The advantage of this guide-slot system is that no movable parts are required for controlling the guide pin movements. The grooves, guide surfaces and guide portions can be injection-moulded in the deck plate from a plastics.

CLAIMS

1. A device in the auto-reverse deck of a magnetic-tape-cassette apparatus, in which the magnetic tape is passed along at least one magnetic/recording playback head (75) which is arranged on a pivotable head-mounting plate (74) which is movable towards the magnetic
5 tape and which by a controlled pivotal movement positions always one of the two pressure rollers (78, 79) arranged on it against the associated capstan (9, 10) and thereby defines the direction of tape transport, characterized by
- 10 - guide slot systems (104, 105) arranged on the tape-deck chassis (1) on both sides of the magnetic head (75),
 - guide pins (86, 87) which are arranged on the head-mounting plate (74) and which can move in the guide slot systems towards an imaginary capstan connecting line (a),
 - 15 - control means (88; 130-133; 103a-133d) which cooperate with the guide-slot systems and which guide the guide pins (86, 87) in the guide-slot systems in such a way that, after each movement of the head-mounting plate (74) away from the connecting line (a), during a subsequent movement towards the connecting line (a) the guide pins (86,
20 87) alternately move in the one or the other guide-slot system into a guide slot branch (96-99; 106-109; 124-127) which blocks the travel of the relevant guide pin (86, 87), so that that pressure roller (78, 79) on the pivoting head-mounting plate (74) can move towards the associated capstan (9, 10) whose associated guide pin (86, 87) meets a
25 path which is not blocked.
2. A device as claimed in Claim 1, characterized in that the guide-slot systems comprise fork-shaped guide slots (104, 105) in the tape-deck chassis (1), which slots comprise two branches (106, 108 and 107, 109) corresponding to the fork tines, one of the branches being
30 shorter than the other and the shorter (or longer) branches (106, 107) both being situated either nearer one another or remote from each other, and in that a central run-in branch (110, 111) which corresponds to the fork handle opens into the trough-shaped fork base (112, 113).



* C L H S *

3. A device as claimed in Claims 1 and 2, characterized in that the control means comprise a control plate (88) which can be moved parallel to the capstan connecting-line (a) between two end positions and in which U-shaped guide slots (94, 95) are formed on both sides of the sound head (75), which slots can be made to coincide with the associated forks-shaped guide slots (104, 105) but which have a smaller distance from each other, so that for alternately positioning the guide pins (86, 87) in the short or the long branches the pointed free ends of the tongues (102, 103) between the branches of the U-shaped guide slots (94, 95) - in the control plate end positions and with refracted head-mounting plate - can alternately be offset in a lateral direction relative to the run-in branches (110, 111) in the one or the other direction of the movement.

4. A device as claimed in Claim 1, characterized in that the guide-slot systems comprise U-shaped grooves (122, 123) formed in the tape-deck chassis (1), which grooves each have a short (126, 127) and a long branch (124, 125) and a double groove (128a, b and 129a, b) at the base connecting the branches (124-127), and in that the control means comprise raised guide surfaces (130-133) on the groove bottoms and guide portions (130a-133a) in the area of the groove bottom, which after each withdrawal and subsequent forward movement of the head-mounting plate (74) only allow the guide pins (86, 87) to move via one of the base grooves (128a, b and 129a, b) from the short branch (126, 127) into the long branch (124, 125) and during the next backward and forward movement to move via the other base groove (128a, b and 129a, b) from the long into the short branch, the short and the long branches being so arranged that upon each backward and forward movement one of the guide pins (86, 87) moves into a short branch, whilst the other guide pin (86, 87) moves into the long branch, and during the subsequent backward and forward movement said guide pin (86, 87) moves into the long and the other into the short branch.

5. A device as claimed in any one of the Claims 1 to 4, characterized in that the guide pins (86, 87) are guided in longitudinal slots (84, 85) in the head-mounting plate (74) so as to be movable parallel to the capstan connecting line (a).

6. A device as claimed in Claim 3, characterized in that the control plate (88) is provided with at least one stop (116) and in that



the apparatus comprises a stop button (63) and a rod (62) which is connected to said button, which rod is provided with a projection (117) which upon actuation of the stop button (63) abuts against the stop
5 (116) and always moves the control plate (88) into one of its end positions.

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