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## (54) FRONT DRIVE CARTRIDGE-TAPE PLAYER SYSTEM

(71) We, MOTOROLA, INC., a corporation of the State of Delaware, United States of America, of O'Hare Plaza, 5725 East River Road, Chicago, Illinois 60631, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to players for continuous loop cartridges and particularly to means for effecting, in one embodiment of the invention fast forward drive for the same and in a second embodiment of the invention, fast forward or reverse drive of the same.

Two serious limitations to the continuous loop tape cartridge player have impeded its popularity. First, there has been no known good way to actuate a fast forward mode of operation. It is not uncommon for a listener of tape to wish to race ahead to more important program material. To do this, clearly, requires increased capstan rate of rotation. It is known in the art to increase the motor speed; however, this significantly reduces the motor's life. A second drawback has been that tape cartridge players are generally not reversible. A listener might wish to play back something he has just heard, and, with conventional systems, he would have to wait for the entire tape to play before he would get to the desired material. Non-reversibility has also limited introduction of 8-track player-recorder combinations since recording requires reversibility to be practical.

According to the present invention there is provided a cartridge tape player comprising a housing provided with a cartridge receiving cavity, a cylindrical capstan rotatably driven about its longitudinal axis by a motor actuated flywheel, the longitudinal axis being in a vertical plane and positioned to forcibly engage a pressure roller of a received cartridge, a plurality of crescents rotatable about

the capstan, each crescent having an inner face, an outer face and a vertical dimension, the inner face encircling greater than 180° of the capstan circumference while revealing a substantial arc of the capstan surface, means operable in a first mode to decouple capstan rotation from the crescents, and operable in a second mode to rotatably connect the crescents to the capstan, means for selecting either the first or second mode, means operable in the first mode to align the crescents such that the capstan surface is forcibly engageable by the pressure roller, and operable in the second mode to cause the outer faces of the crescents to form a substantially circular configuration as viewed from a point above the axis of the capstan, the vertical height and positioning of the crescents being such that in the second mode, the pressure roller contacts all crescents in succession and the effective capstan diameter being thereby increased in order to transport the tape at increased speed.

The invention will now be described by way of example only with particular reference to the accompanying drawing, wherein:

Figure 1 illustrates a view of a cartridge-player combination;

Figure 2 illustrates the tape player having a pair of crescents;

Figure 3 illustrates operation of a two crescent fast forward system and

Figure 4 illustrates operation of a three crescent fast forward-fast reverse system.

Figure 1 illustrates a tape cartridge 30 inserted in a tape player. Shown is the player housing 10 including a motor 14 which actuates a flywheel 13 which in turn rotatably drives a capstan 12. Located on the capstan are a pair of crescents 15. The cartridge 30 is provided with a notched cut-out 31 which is forcibly engaged by a spring and roller assembly 33 affixed to the player housing 10. The assembly forces the cartridge in locking engagement in the housing.

Located within the cartridge housing 30

is a base portion 34 and a front wall portion 50. The front wall portion 50 is provided with front access cavities 57 for an end of tape sensor 27, and a tape head 20, and a front access cavity 51 for the capstan 12. A hub 35 is rotatably mounted to the base 34 of the cartridge housing 30. A platen 45 is rotatably mounted between the hub 35 and base 34. Also, a pressure roller 36 is rotatably mounted to the base 34. A continuous tape loop 37 is wound on the hub 35 and is further routed via guide 40 past the front access cavities, and a pair of pressure pads 39, and around the roller 36. The capstan 12 is seen to forcibly engage the pressure roller 36 whereby rotational movement of the capstan is coupled to the pressure roller. As the tape is pinched between the capstan and pressure roller the tape similarly is driven. When driven in the forward direction the tape is removed from the hub 35 at an inner convolution routed by the access cavities and the pressure roller and returned to the hub at an outer convolution.

A pulley 41 is permanently affixed to the hub for rotation therewith. A second pulley 42 is coupled to the pressure roller 36 via a sprag clutch 43. The clutch 43 operates to couple the pressure roller 36 to the second pulley 42 when the roller is driven in the reverse direction, the clutch otherwise decouples the pressure roller from the second pulley. An "O" ring 44, made of an elastic material such as rubber, is stretched to ride in the pulleys 41, 42 thus coupling rotational movement of one to the other. The pulleys, "O" ring, and clutch act as a means to couple the rotational movement of the pressure roller to the hub when the pressure roller is driven in the reverse direction and to decouple the rotational movement of the pressure roller from the hub when the pressure roller is driven in the reverse direction. Thus the capstan acts as a primary drive which in turn engages the driven pressure roller in either a forward or reverse direction. The tape, being routed between the pressure roller and capstan at their engaging interface is similarly driven. The pulleys, "O" ring and clutch act as a secondary drive which operates to transfer rotational drive from the pressure roller to the hub when the capstan is operating the pressure roller in the reverse direction and otherwise effectively decoupling the hub from the pressure roller.

Fig. 2a illustrates a two crescent tape player which provides normal and fast forward modes of operation. As discussed with reference to Figs. 1, the player includes a housing 10. The housing includes a cartridge receiving cavity 11. In the housing at the furthest recess of the cavity are located

a tape head 20 having a pair of pickups 21, and an end of tape sensor 27. The tape head is located to align its pickup 21 with recorded tracks of an inserted tape cartridge 30. Track selection is effected by relocating the pickups with respect to the tracks via a head indexing means 23. Also located at the furthest recess of the cavity 11 is a cylindrical capstan 12 whose longitudinal axis is in a vertical plane and which is predeterminedly positioned to forcibly engage the pressure roller of a received cartridge 30. The capstan is rotatably driven about its longitudinal axis by a flywheel (not shown) actuated by a motor 14.

A pair of crescents 15a, b are rotatably located on the capstan for rotation thereabout. The crescents are better understood with reference to Fig. 2b wherein it is seen that the crescents have an inner or concave face 66, an outer convex face 67 and a vertical dimension, or height H. The inner face is formed to slidably contour to and encircle greater than 180° of the capstan circumference. However, a substantial arc on the capstan surface is still revealed. The outer face 67 is an arc of predetermined radius selected to provide a desired fast forward speed. The vertical dimension H is selected such that each of the two crescents has access to an inserted cartridge pressure roller. The first or lower crescent 15a is slidably located on the capstan 12 and is vertically supported by a bearing 16. The upper crescent 15b is located on the capstan and is vertically supported by the lower crescent.

A pin 80 extends downwardly from the lower surface of the upper crescent 15b into a slot 81 provided in the upper surface of the lower crescent 15a. The slot 81 is formed in an arc  $\alpha$  and has first and second end walls 82, 83 respectively. A spring clutch 17, substantially cylindrical in shape, has a predetermined diameter to slide over the capstan and has a first end which engages the upper crescent 15b and a second end shown extending outwardly at 70 (see Figure 3a). An upper bearing 71 supports the capstan in the vertical direction. An L-shaped control lever 72 is pivotally mounted from a support pin 73 which extends vertically from the base of the housing 10. The first arm of the control lever 72 is located to engage the second end 70 of the spring clutch 17. The second arm of the L-shaped control lever 72 is positioned to be forcibly engaged by the foot 74 of an actuator bar 75. The bar is slidably located in the side of the housing 10, and has at its head a pushbutton 76 accessible external to the cartridge player. The pushbutton 76 is spring loaded such that the button returns to an outer or rest position when not actuated.

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In the rest position, the bar 75 acts through foot 74 on the control lever 72 to allow lever 72 engagement with second end 70 of the spring clutch 17. On pushbutton 76 depression, the bar 75 acts through foot 74 to pivot the control lever 72 out of engagement with the spring end 70. Lever and spring clutch operation is further described hereinbelow. An optional second foot 77 extends from the actuator bar 75 and is located to engage an optional electrical switch 78 which is mounted on the side of the housing 10. The switch is wired to the motor 14 whereby in its rest position the switch causes the motor to rotate at its normal speed, and in the actuated position the switch causes the motor to increase RPM.

In its normal mode of operation, the crescents are aligned via the action of the control lever on the clutch spring end 70 such that the revealed surface of the capstan is engageable with the pressure roller of an inserted cartridge. In this mode the pressure roller is driven at a rate dependent upon the motor speed and the capstan radius. When the fast forward mode is desired, i.e. when the operator pushes pushbutton 76, the control lever swings out of engagement with the spring clutch. The diameter of the spring clutch decreases allowing it to forcibly engage the capstan for rotation therewith. As the upper surface of the upper crescent 15b is affixed to the first end of the clutch, the crescent 15b also rotates with the capstan. After upper crescent rotation of 180°, the pin 80 engages the first end wall 82 of the slot 81 in the lower crescent 15a. The resultant pin to wall engagement causes the lower crescent 15a to similarly rotate about the capstan 12. When viewed downwardly from a point above the axis of the capstan, the outer faces 67 of the crescents form a circular configuration about the capstan having a diameter considerably greater than that of the capstan, which has two effects. First the increased diameter acting on the cartridge pressure roller forces the cartridge a slight distance in a direction out of the cartridge receiving cavity 11. This removes the tape from contact with the tape head 20 and end of tape sensor 27 such that in this fast forward mode there is no deleterious rubbing of the tape to tape-player components. Also, the increased effective capstan diameter drives the pressure roller at an increased rate. This increased rate is related to the normal rate in proportion to the ratio of effective to actual capstan diameters. Further, as electrical switch 78 is in its actuated position, motor speed is further increased thus creating an increased fast forward rate. In a preferred embodiment the electrical switch 78 causes the motor to

rotate at twice its normal rate, and the crescents act to increase the effect radius of the capstan by three times. Thus the fast forward rate becomes six times the normal tape player rate.

Fig. 3 illustrates the cycle of fast forward operation. Referring to Figure 3a, the lower crescent 15a is shown mounted on the capstan 12 and vertically supported by the bearing 16 which rests on the cartridge player housing 10. The upper crescent 15b is also slidably mounted on the capstan 12 and is vertically supported by the lower crescent 15a. The pin 80 extending downwardly from the lower surface of the upper crescent engages the slot 81 provided in the upper surface of the lower crescent. As better seen in Fig. 3b, which is a view from a point above the capstan looking down on the crescents, the slot 81 provided in the lower crescent 15a extends for an angle  $\alpha$  which in the preferred embodiment is approximately 180°. The slot terminates in two end walls 82, 83. The spring clutch 17 is also located on the capstan. The spring clutch 17 is substantially cylindrical in shape and has a first end 71a and a second end 70. The first end 71a is located and affixed in a slot 73a provided in the upper surface of the upper crescent 15b. The second spring end 70 is located to be engaged by the control lever 72.

When the capstan is driven in its forward direction, indicated by arrow 75b, and when the control lever 72 is in engaging relation with spring end 70, the net forces on the spring clutch 17 provided by the friction between the rotating capstan and the concave face 66 of crescent 15b tend to increase the spring cylindrical diameter thereby decoupling the spring from the rotating capstan shaft. Further, the location of the spring's first and second ends 71a, 70 locates the upper crescent 15b such that the revealed surface of the capstan 12 is in engaging contact with the pressure roller 36 of an inserted cartridge 30. In this position, as shown in Fig. 3b, the pin 80 of the upper crescent 15b is located at end wall 83 of slot 81.

Capstan rotation is illustrated in Fig. 3c. Here the upper crescent 15b has rotated to a point such that the pin 80 engages the first end wall 82 of the slot 81. This is more clearly shown in Fig. 3d. As is seen in Fig. 3c crescent 15b has deflected the roller 36 and cartridge 30 by the increase in effective capstan diameter in the direction 86. As mentioned above, the effect of the increased capstan diameter is two-fold. First, the tape is no longer engaging the tape head and end of tape sensor in the tape player. Thus there is no deleterious wear between the tape and the tape player components. Also, due to the effective increase in cap-

stan diameter the pressure roller is moving at a higher rotational speed. This of course drives the tape faster and effects fast forward tape operation. Since the pin 80 is engaging the first end wall 82 the lower crescent is coupled to rotate with the upper crescent. Thus in the fast forward mode the crescents are sequentially aligned such that the outer faces form a substantially circular configuration as viewed from above the axis of the capstan.

Upon return to normal playing speed, the control lever 72 is relocated in position to engage the second end 70 of the spring clutch 17 while friction tends to continue to drive crescent 15b. The net force on the spring causes the spring diameter to increase and once again decouple the spring from the capstan. Due to the realignment of pin 70 with the control lever 72, the first spring end 71a realigns upper crescent 15b to reveal the capstan surface to the pressure roller.

A second embodiment of a tape player according to the instant invention incorporates three crescent members. This embodiment is illustrated in Fig. 4.

In Fig. 4a it is seen that the three crescent system includes the cartridge housing 10, the bearing 16, the capstan 12, and the control lever 72. Each crescent 101 to 103 has an inner face and an outer face substantially similar to the two crescent system. However, the vertical height of a crescent in the three crescent system is slightly reduced, such that each crescent is engageable with the pressure roller 36 of an inserted cartridge 30. The lower crescent 103 is rotatably and slidably located on the capstan 12 and vertically supported by the bearing 16. The middle crescent 102 is rotatably and slidably located on the capstan 12 and is vertically supported by the lower crescent 103. Finally, the upper crescent 101 is also rotatably and slidably mounted on the capstan and is vertically supported by the middle crescent 102. The lower surface of the middle crescent 102, and the lower surface of the upper crescent 101, are provided with downwardly extending pins 104, 105 respectively. Pin 104 rides in a curved slot 106 provided in the upper surface of the lower crescent 103. Similarly, pin 105 rides in a curved slot 107 provided in the upper surface of the middle crescent 102. As shown in Fig. 4b, the slots extend to an angle  $\beta$  which is equal to  $120^\circ$ . As with the two crescent system, the slots terminate in end walls. Further, as shown in Fig. 4b the upper crescent is provided with a cam engaging face 110 which is suitably graded for engaging the pressure roller 36 and capstan 12 interface when the capstan is rotatably driven in a forward direction.

Similarly, the lower crescent 103 is provided with an engaging face 111 which is suitably graded for engaging the pressure roller and capstan interface when the capstan is driven in a reverse direction.

A third pin 112 is located in the upper surface of the upper crescent 101, and is suitably positioned to be engaged by the control lever 72. There is no spring clutch required in the three crescent system as the system is designed to operate on the frictional forces between the capstan and the concave face of the leading crescent which is sufficient to get the leading crescent rotating. That frictional force is increased by the force of spring and roller-assembly 33 tending to push the cartridge 30 inwardly and pressure roller 36 into contact with the capstan 12.

Fig. 4a represents the player in the forward, normal speed condition. The lever 72 engaging the pin 112 locates the upper crescent such that the revealed surface on the capstan is opposite the pressure roller. The remaining crescents are in parallel alignment with the upper crescent such that the pressure roller is contacting the revealed capstan surface.

In the fast forward mode of operation, the control lever 72 is located to disengage the pin 112. Friction between the capstan and the concave face of crescent 101, the lead crescent in this instant, drives the engaging face 110 of the upper crescent 101 into the pressure roller 36 and capstan surface interface. At that point the opposing force of spring assembly 33 increases the afore-said frictional force such that the upper crescent is pulled and then driven with the capstan. Further, the pressure roller and cartridge 30 are driven in a direction out of the cartridge receiving cavity, thus locating the tape out of contacting engagement with various tape player components.

With further rotation, as illustrated in Fig. 4c and 4d, the middle crescent pin 104 engages the end wall of the lower crescent slot 106 whereby the lower crescent is driven with the upper crescents. The relative positions of the pins in slots causes the three crescents to adopt a circular configuration as viewed from above as in Fig. 4d. Thus, the effective capstan diameter has been increased providing the required fast forward motion. When the leading crescent 101 is wholly out of contact with the pressure roller, friction between the lower surface of the upper crescent and upper surface of the middle crescent keeps the upper crescent rotating with the capstan to maintain the crescent configuration.

When the system is activated back to the normal forward mode, the control lever 72 is returned to a position whereby it can

engage pin 112. This relocates the upper crescent 101 in a position which reveals the capstan surface to the cartridge pressure roller 36.

5 In the reverse mode the control arm 72 is moved in a direction to disengage pin 112. Now the engaging face 111 of the lower crescent 103, which is the leading crescent in this instance, engages the pressure roller 36 and capstan 12 interface. Also, as before, the cartridge is translated in a direction 122 such that the cartridge tape disengages the tape player components. The frictional forces discussed above in the fast forward mode apply in the reverse sequence too, thus reverse operation is easily appreciated.

#### WHAT WE CLAIM IS:—

20 1. A cartridge tape player comprising a housing provided with a cartridge receiving cavity, a cylindrical capstan rotatably driven about its longitudinal axis by a motor actuated flywheel, the longitudinal axis being in a vertical plane and positioned to forcibly engage a pressure roller of a received cartridge, a plurality of crescents rotatable about the capstan, each crescent having an inner face, an outer face and a vertical dimension, the inner face encircling greater than 180° of the capstan circumference while revealing a substantial arc of the capstan surface, means operable in a first mode to decouple capstan rotation from the crescents, and operable in a second mode to rotatably connect the crescents to the capstan, means for selecting either the first or second mode, means operable in the first mode to align the crescents such that the capstan surface is forcibly engageable by the pressure roller, and operable in the second mode to cause the outer faces of the crescents to form a substantially circular configuration as viewed from a point above the axis of the capstan, the vertical height and positioning of the crescents being such that in the second mode, the pressure roller contacts all crescents in succession and the effective capstan diameter being thereby increased in order to transport the tape at increased speed.

55 2. A player as claimed in Claim 1 having first and second crescents and comprising a support means adjoining the capstan, the second crescent slidably mounted on the capstan and vertically supported by the support means, and the first crescent slidably mounted on the capstan and vertically supported by the second crescent.

60 3. A player as claimed in Claim 1 or 2 having first and second crescents and wherein the aligning means includes a pin affixed to the bottom surface of the first crescent and extending downwards therefrom, and a slot located in the top surface of the second crescent, and having a curvature such as to

allow passage of the pin, and said slot having end walls suitably for forcibly engaging the pin.

4. A player as claimed in Claim 3 wherein the crescents are of identical dimensions and the first crescent is rotatable 180° out of alignment with the second crescent before the pin engages an end wall.

5. A player as claimed in any preceding claim wherein the decoupling means comprises a movable stop member and a spring having first and second ends and a plurality of turns of given diameter, the turns located about the capstan, the first end forcibly engaging a first crescent, the second end operably engageable with the movable stop member, whereby under the action of friction between the capstan and the inner face of the first crescent the spring diameter increases to slide on the capstan when the second end engages the stop member, otherwise the spring diameter decreasing to clutch the capstan and rotate therewith.

6. A player as claimed in Claim 5 wherein the selecting means includes a lever, spring loaded to rest in the first mode, and manually operable via a pushbutton located on the front of the player to the second mode, the lever locating the stop member to disengage the spring second end when the lever is operated to the second mode, the lever otherwise locating the stop member to engage the second end.

7. A player as claimed in Claim 1 with the capstan rotatable in either a forward or reverse direction, and having an upper, a lower and a middle crescent, a support means adjoining the capstan, the lower crescent being provided with a graded engaging face suitable for forcibly engaging the pressure roller when the capstan is driven in the reverse direction, the lower crescent slidably mounted on the capstan and vertically supported by the support means, the middle crescent slidably mounted on the capstan and vertically supported by the lower crescent, the upper crescent being provided with a graded engaging face suitable for forcibly engaging the pressure roller when the capstan is driven in the forward direction, the upper crescent slidably mounted on the capstan and vertically supported by the middle crescent.

8. A player as claimed in Claim 7 wherein the aligning means includes a first pin extending downwards from the bottom surface of the middle crescent, a first slot located in the top surface of the lower crescent and having a curvature such as to allow passage of the first pin, and said first slot having end walls for forcibly engaging the first pin, a second pin extending downwards from the bottom surface of the upper crescent, a second slot located in the top sur-

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engage pin 112. This relocates the upper crescent 101 in a position which reveals the capstan surface to the cartridge pressure roller 36.

In the reverse mode the control arm 72 is moved in a direction to disengage pin 112. Now the engaging face 111 of the lower crescent 103, which is the leading crescent in this instance, engages the pressure roller 36 and capstan 12 interface. Also, as before, the cartridge is translated in a direction 122 such that the cartridge tape disengages the tape player components. The frictional forces discussed above in the fast forward mode apply in the reverse sequence too, thus reverse operation is easily appreciated.

#### WHAT WE CLAIM IS:—

1. A cartridge tape player comprising a housing provided with a cartridge receiving cavity, a cylindrical capstan rotatably driven about its longitudinal axis by a motor actuated flywheel, the longitudinal axis being in a vertical plane and positioned to forcibly engage a pressure roller of a received cartridge, a plurality of crescents rotatable about the capstan, each crescent having an inner face, an outer face and a vertical dimension, the inner face encircling greater than 180° of the capstan circumference while revealing a substantial arc of the capstan surface, means operable in a first mode to decouple capstan rotation from the crescents, and operable in a second mode to rotatably connect the crescents to the capstan, means for selecting either the first or second mode, means operable in the first mode to align the crescents such that the capstan surface is forcibly engageable by the pressure roller, and operable in the second mode to cause the outer faces of the crescents to form a substantially circular configuration as viewed from a point above the axis of the capstan, the vertical height and positioning of the crescents being such that in the second mode, the pressure roller contacts all crescents in succession and the effective capstan diameter being thereby increased in order to transport the tape at increased speed.

2. A player as claimed in Claim 1 having first and second crescents and comprising a support means adjoining the capstan, the second crescent slidably mounted on the capstan and vertically supported by the support means, and the first crescent slidably mounted on the capstan and vertically supported by the second crescent.

3. A player as claimed in Claim 1 or 2 having first and second crescents and wherein the aligning means includes a pin affixed to the bottom surface of the first crescent and extending downwards therefrom, and a slot located in the top surface of the second crescent, and having a curvature such as to

allow passage of the pin, and said slot having end walls suitably for forcibly engaging the pin.

4. A player as claimed in Claim 3 wherein the crescents are of identical dimensions and the first crescent is rotatable 180° out of alignment with the second crescent before the pin engages an end wall.

5. A player as claimed in any preceding claim wherein the decoupling means comprises a movable stop member and a spring having first and second ends and a plurality of turns of given diameter, the turns located about the capstan, the first end forcibly engaging a first crescent, the second end operably engageable with the movable stop member, whereby under the action of friction between the capstan and the inner face of the first crescent the spring diameter increases to slide on the capstan when the second end engages the stop member, otherwise the spring diameter decreasing to clutch the capstan and rotate therewith.

6. A player as claimed in Claim 5 wherein the selecting means includes a lever, spring loaded to rest in the first mode, and manually operable via a pushbutton located on the front of the player to the second mode, the lever locating the stop member to disengage the spring second end when the lever is operated to the second mode, the lever otherwise locating the stop member to engage the second end.

7. A player as claimed in Claim 1 with the capstan rotatable in either a forward or reverse direction, and having an upper, a lower and a middle crescent, a support means adjoining the capstan, the lower crescent being provided with a graded engaging face suitable for forcibly engaging the pressure roller when the capstan is driven in the reverse direction, the lower crescent slidably mounted on the capstan and vertically supported by the support means, the middle crescent slidably mounted on the capstan and vertically supported by the lower crescent, the upper crescent being provided with a graded engaging face suitable for forcibly engaging the pressure roller when the capstan is driven in the forward direction, the upper crescent slidably mounted on the capstan and vertically supported by the middle crescent.

8. A player as claimed in Claim 7 wherein the aligning means includes a first pin extending downwards from the bottom surface of the middle crescent, a first slot located in the top surface of the lower crescent and having a curvature such as to allow passage of the first pin, and said first slot having end walls for forcibly engaging the first pin, a second pin extending downwards from the bottom surface of the upper crescent, a second slot located in the top sur-



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5 face of the middle crescent, and having a curvature such as to allow passage of the second pin and said second slot having end walls for forcibly engaging the second pin.

9. A player as claimed in Claim 8 wherein in the second mode with the capstan forwardly driven the first pin engages an end wall of the first slot when the upper crescent leads the middle crescent by 120°, and the second pin engages an end wall of the second slot when the second crescent leads the lower crescent by 120°.

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15 10. A player as claimed in Claim 8 wherein in the second mode with the capstan reversely driven the second pin engages an end wall of the second slot when the lower crescent leads the middle crescent by 120°, and the first pin engages an end wall of the first slot when the middle crescent leads the upper crescent by 120°.

20 11. A player as claimed in Claim 8 wherein the aligning means and decoupling means further comprises a stop pin extend-

25 ing from the upper surface of the upper crescent, a manually actuated lever operable in the first mode to engage the stop pin at a predetermined upper crescent position and operable in the second mode to disengage the stop pin.

30 12. A player as claimed in Claim 11 wherein the selecting means includes a manually operable pushbutton accessible from the front of the player and coupled to the lever, the rest position of the pushbutton 35 locating the lever in the first mode, manual activation of the pushbutton locating the lever in the second mode.

40 13. A cartridge tape player substantially as hereinbefore described and as shown in Figures 1 to 3 or Figure 4 of the accompanying drawings.

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