

United States Patent

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[33] **Japan**
[31] **43/23073 and 43/29483**

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[54] **APPARATUS FOR SELECTIVELY FEEDING AN
ENDLESS TAPE AT NORMAL OR FAST FEED AND
FOR AUTOMATICALLY CHANGING FROM FAST
FEED TO NORMAL FEED**
7 Claims, 8 Drawing Figs.

[52] U.S. Cl. **179/100.2 R,**
179/100.1 VC, 179/100.2 S, 226/178
[51] Int. Cl. **G11b 15/44**
[50] Field of Search. 179/100.2
B, 100.2 S, 100.2, 100.1 VC; 242/200; 226/17 B

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ABSTRACT: A tape fast feed control apparatus in an endless magnetic tape cartridge player comprising a rotary drive capstan for driving the tape in the cartridge, an electric motor provided for driving the capstan and having an armature shaft, a first and a second speed reducing device having reduction ratios different from each other for imparting rotation of the armature shaft to the capstan, a selecting device for selecting either one of the first and second speed reducing devices to impart rotation of the armature shaft to the capstan, an electromagnetic device for magnetically engaging the selecting device, a control device for controlling the operation of said electromagnetic device whereby the tape is changed over from normal speed to fast speed and automatically changed over from fast feed to normal speed in relation to the operation of said control device.

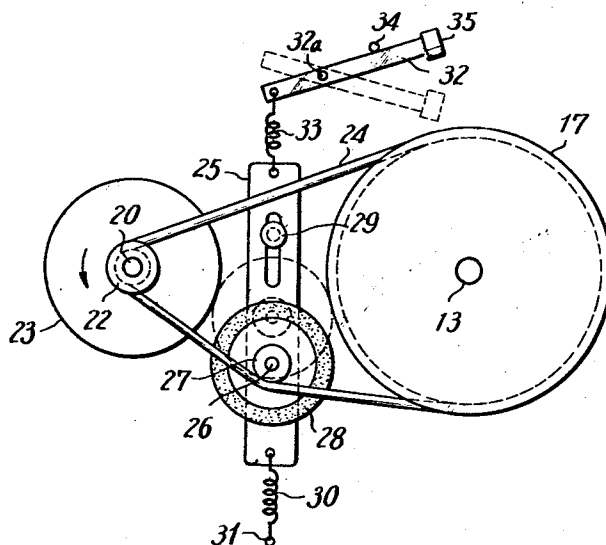


FIG. 1

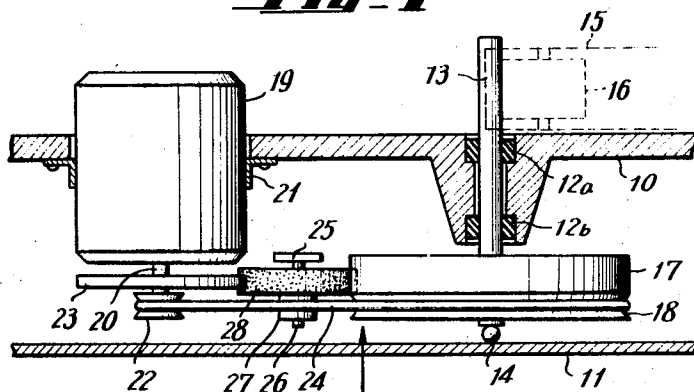


FIG. 2

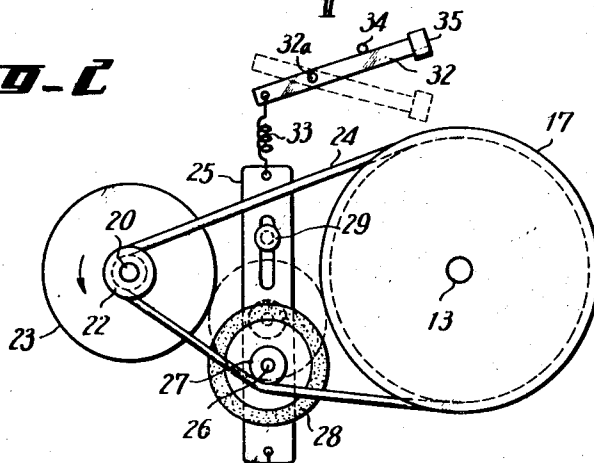
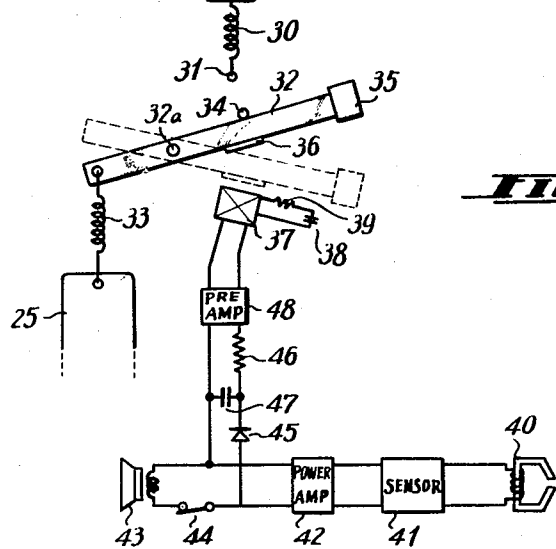


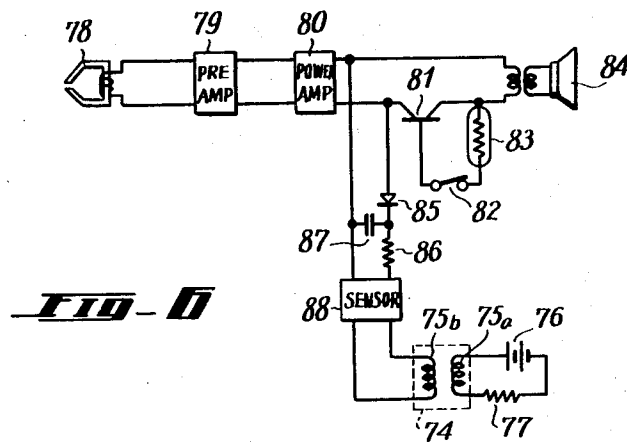
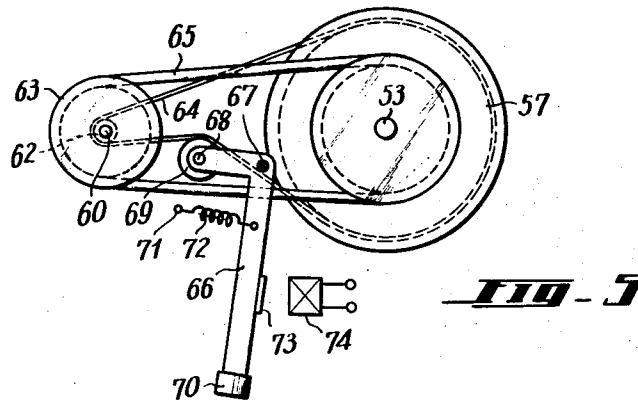
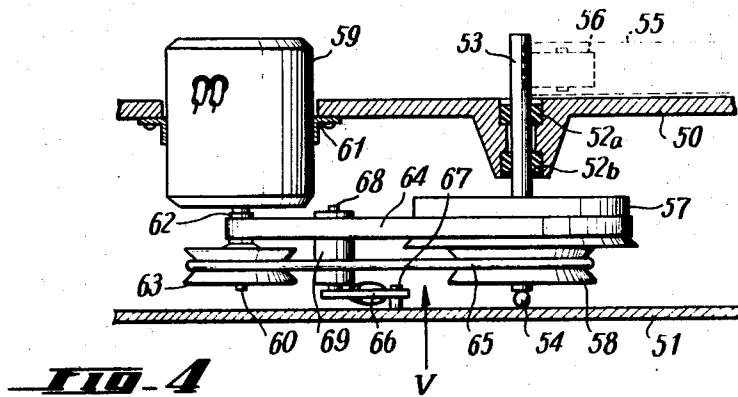
FIG. 3



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FIG - 7

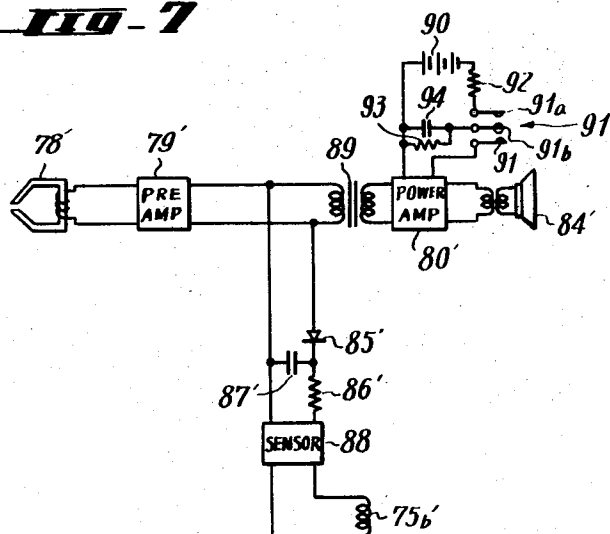
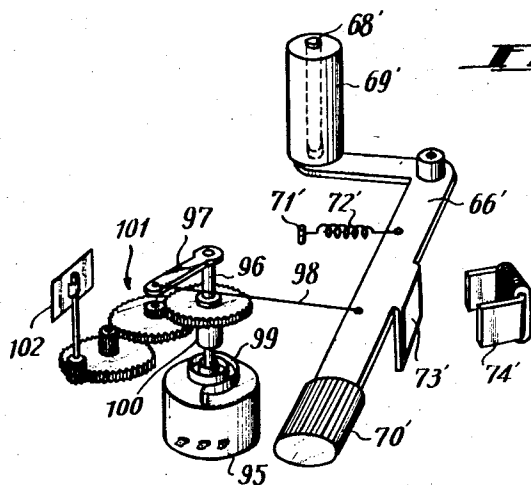


FIG - 8



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APPARATUS FOR SELECTIVELY FEEDING AN ENDLESS TAPE AT NORMAL OR FAST FEED AND FOR AUTOMATICALLY CHANGING FROM FAST FEED TO NORMAL FEED

BACKGROUND OF THE INVENTION

This invention relates to a tapefast feed control apparatus for an endless magnetic tape cartridge player. A magnetic tape reproducing instrument utilizing an endless magnetic tape cartridge has been widely used due to its simple manipulation. However, there is difficulty with the usage thereof since it is impossible to rewind an endless magnetic tape. Such difficulty with rewinding of the tape is solved substantially by tape fast feed. The fast feed of tape is attained by speeding up the rotating speed of a rotary capstan for driving the tape. It is well known that the rotating speed of an electric motor for driving the capstan can be raised or a reduction ratio of a speed reducing device coupling the electric motor to the capstan can be reduced for the purpose of speeding up the rotating speed of capstan. However, a motor capable of varying its rotating speed is generally expensive, and a speed reducing device is complicated, cartridge player for this reason, it is necessary to autimize.

For automation of fast feed, there is considered a method for automatically completing fast feed upon sensing a non-record zone between prerecorded zones recording a song or musical composition provided on one track of the tape. Since the nonrecord zone on the tape used in a currently available tape cartridge is kept for about ten seconds, the nonrecord zone and a substantial nonsignal portion in the record zone can be electrically distinguished. It is not desirable that a reproducing sound should be made from the speaker during the fast feed of the tape. In view thereof, it is important not to apply the reproducing signal to the speaker during the fast feed of the tape. Further when the tape is changed over from fast feed to normal feed, the tape is not instantly changed to normal feed due to the inertia of the tape driving system so that an abnormal sound of high level is emitted from the speaker. Thus, it is preferred that the reproducing sound from the speaker is of gradually increased volume, namely, is faded in when the tape is changed over from fast feed to normal feed.

SUMMARY OF THE INVENTION

It is a general object of the present invention to provide a tape fast feed control apparatus in an endless magnetic tape cartridge.

Another object of the invention is to provide a tape fast feed control apparatus of the type above-described which comprises a rotary drive capstan for driving the tape within an endless magnetic tape cartridge, and a first and a second speed reducing device provided between the capstan and an armature shaft of an electric motor for driving the capstan and having different reduction ratios whereby the tape is normally fed or fast fed by selectively operating either the first or second speed reducing device by a selecting means.

A further object of the invention is to provide a tape fast feed control apparatus in an endless magnetic tape cartridge player, wherein the first speed reducing device and/or the second speed reducing device comprise a belt transmission system, and rotation of the armature shaft of the motor is imparted to the capstan only when a belt is tensioned by the selecting means.

Still further object of the invention is to provide a tape fast feed control apparatus of the class above-described wherein an electrical signal is applied to an electromagnetic means which holds the selecting means in a situation to fast feed the tape and wherein the nonrecord zone between one record zone and next record zone on the tape is sensed whereby said selecting means is returned to its original position to automatically complete the tape fast feed.

Yet another object of the invention is to provide a tape fast feed control apparatus in an endless magnetic tape cartridge player which prevents the reproducing sound from emitting from a speaker during tape fast feed and enables the speaker to emit the reproducing sound in a fade-in system upon changing the tape from fast feed to normal feed.

The foregoing and other objects of the invention may be more clearly understood from the following description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side view of one embodiment of a tape fast feed control apparatus according to the present invention with one part in section and the other part being omitted away;

FIG. 2 is a bottom view of the apparatus of FIG. 1 looking from the direction of II therein;

FIG. 3 shows electromagnetic means engaging the lever shown in FIG. 2 and control means for said electromagnetic means;

FIG. 4 is a side view of an alternative form of a tape fast feed control apparatus according to the invention with one part in section and the other part being omitted away;

FIG. 5 is a bottom view of the apparatus of FIG. 4 looking from the direction of V therein;

FIG. 6 shows a schematic block diagram which constitutes control means for electromagnetic means engaging the lever shown in FIG. 5;

FIG. 7 shows another schematic block diagram constituting the other form of control means shown in FIG. 6;

FIG. 8 is a perspective view of a further embodiment other than control means controlling volume output from the speaker.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, and in particular to FIGS. 1 and 2, the reference numeral 10 designates a horizontal deck within a housing (not shown) for an endless magnetic tape cartridge player. A capstan 13 is rotatably mounted by bearings 12a, 12b provided on the deck 10 and a ball bearing 14 on a bottom plate 11 of the housing. The capstan 13 extends through the bearings 12a, 12b over the deck 10 and is adapted to cooperate with a pinch roller 16 of an endless magnetic tape cartridge 15 when set in its operating position on the deck 10. A capstan wheel 17 which has a belt groove at the periphery thereof is secured to the capstan 13 between the deck 10 and the bottom plate 11. Mounted on the deck 10 by means of bracket 21 is an electric motor 19 for driving the capstan 12. An armature shaft 20 of the motor 19 is disposed between the deck 10 and the bottom plate 11 to be parallel to the capstan 13 and is provided with a drive pulley 22 and a drive wheel 23. The drive pulley 22 and the drive wheel 23 are connected through an idler wheel 28 to the capstan wheel 17. The idler wheel 28 with an idler pulley 27 is rotatably mounted on a shaft 26 mounted on a slide member 25. Slidably and reciprocally mounted on a guide pin 29 on a bracket (not shown) secured to the bottom plate 11 is the slide member 25. A tension spring 30 is connected between one end of the slide member 25 and a post 31 on the bottom plate 11. The spring 30 biases the slide member 25 to a position where the idler pulley 27 abuts against a belt 24. Where the idler pulley 27 abuts against the belt 24, the idler wheel 28 is kept away from the drive wheel 23 and the capstan wheel 17. Thus, rotation of the armature shaft 20 of the motor 19 is imparted through the drive pulley 22, belt 24 and the capstan wheel 17 to the capstan 13. The slide member 25 is at the other end thereof connected via a spring 33 to a swinging lever 32 at one end thereof which is rotatably supported by a pin 32a. Counterclockwise rotation of the swinging lever 32 (FIG. 2) is prevented by a stopper pin 34. By manually rotating the swinging lever 32 clockwise to move it to a position shown by the dotted line of FIG. 2, the idler pulley 27 and the idler wheel 28 as well as the slide member 25 are caused to be

moved to a position shown by the dotted circle. In this position, the idler pulley 27 is away from the belt 24 to engage the idler wheel 28 with the drive wheel 23 and the capstan wheel 17. Rotation of the armature shaft 20 of the motor 19 is, therefore, imparted through the drive wheel 23, idler wheel 28 and the capstan wheel 17 to the capstan 13. At this moment, tension of the belt 24 has been so slackened that the belt will slip off the drive pulley 22 and the capstan wheel 17.

Since the drive pulley 22 has a diameter smaller than that of the drive wheel 23 while the latter is larger than the idler wheel 28 in diameter, reduction speed ratio in relation to impartation of rotation of the armature shaft 20 to the capstan wheel 17 is small in case of the medium of the drive wheel 23 and the idler wheel 28 as compared with the drive pulley 22 and the belt 24. For this reason, where the swinging lever 32 is in the position shown by a solid line, the capstan 13 is rotated at low speed to drive the tape within the cartridge 15 at normal speed while the swinging lever 32 is in the position shown by a dotted line so that the capstan 13 is rotated at high speed to drive the tape at fast speed. From the foregoing, it is apparent that the tape speed may be converted from normal feed to fast feed and vice versa by operation of the swinging lever 32. Although the belt 24 slips off during the tape fast feed, no friction loss of the belt in fact occurs since the period of such time is comparatively short. If desired, the drive pulley 22 may be adapted to serve as a freewheel in relation to the armature shaft 20 so as to freely rotate. By this arrangement, the belt 24 does not slip off the drive pulley 22 and the capstan wheel 17 even during the tape fast feed.

In FIG. 3, means is shown for retaining the swinging lever 32 in the position shown by the dotted line of FIG. 2 and returning the same to its original position. Like parts in FIG. 3 are designated by like numerals. The swinging lever 32 is provided at one end thereof with a knob 35 coils at one side thereof with a magnetic substance piece 36. The knob 35 projects from a control panel (not shown) of the endless magnetic tape cartridge player (not shown) and is adapted to be manually operated. The magnetic substance piece 36 is magnetically attracted to an electromagnetic means 37 secured to a stationary portion within the housing of the cartridge player when the swinging lever 32 is rotated to the position shown by the dotted line of FIG. 2. The electromagnetic means 37 includes a first and a second coil (not shown) and a core to which the two coiled wound and is attractively engaged to the magnetic substance piece 36 by the magnetic flux generated from the first coil. The first coil of the electromagnetic means 37 is energized through a resistance 39 by an electrical source 38. The second coil of the electromagnetic means 37 is energized by a sensing circuit producing an electric signal in response to a nonrecord zone between one record and a next record zone on the endless magnetic tape within the tape cartridge 15. The details of the sensing circuit will be hereinafter described.

A magnetic head 40 feeds a preamplifier 41. The output of the preamplifier 41 is applied to a power amplifier 42 which drives a speaker 43. The output of the power amplifier 42 is applied through an electric switch 44 to the speaker 43. The electric switch 44 is provided in a position enabling it to be operated by the swinging lever 32. The electric switch 44 is normally closed but is opened when the swinging lever 32 is moved to the position where the tape is fast fed, namely, the swinging lever 32 is engaged with the electro magnetic means 37. The output of the power amplifier 42 is also applied to a rectification circuit comprising a diode 45, a resistance 46, and a condenser 47. The output signal, rectified by the rectification circuit, of the power amplifier 42 is applied to a sensor 48. The output of the sensor 48 is applied to the second coil of the electromagnetic means 37. The sensor 48 does not produce an output signal if there is an input signal applied to the sensor, it but it does produce an output signal if there is no input signal. The sensor 48 is constituted, for instance, by a Schmidt circuit. During passage of the record zone on the tape through the magnetic head 40 when the magnetic tape is

driven, the sensor 48 does not produce an output signal since the rectified reproducing signal is applied to the sensor 48. However, when the nonrecord zone on the tape passes through the magnetic head 40, the reproducing signal decays after the lapse of time lag determined by the resistance 46 and the condenser 47 to cut off the signal applied to the sensor 48 whereby the sensor 48 produces an electric signal. This electric signal is applied to the second coil of the electromagnetic means 37 to magnetize the coil. Where the magnetic tape is run at normal speed, the magnetic substance piece 36 is positioned away from the electromagnetic means 37 so that the latter does not substantially act on the former. Where the magnetic tape is transported at fast speed, the magnetic substance piece 36 is magnetically attracted to the electromagnetic means 37. As a result, the means 37 loses the magnetic attraction of the magnetic substance piece 36 when the second coil of the means 37 is excited by the electric signal from the sensor 48. Therefore, the swinging lever 32 with the slide member 25 is returned to its original position by the elasticity of the tension spring 30 (FIG. 2) whereby the magnetic tape is automatically changed from fast feed to normal feed. In other words, the tape driven at fast speed is automatically run at normal speed in response to the nonrecord zone. As long as the tape is driven at fast speed, the electric switch 44 is opened so that the reproducing sound is not emitted from the speaker 43. It is necessary that the time lag determined by the resistance 46 and the condenser 47 should be slightly lesser than the time which requires to allow the nonrecord zone on the tape to pass through the magnetic head 40 when the tape is driven at fast speed.

An alternative form of the invention is illustrated in FIGS. 4 through 5 where a capstan 53 is rotatably mounted on bearings 52a, 52b provided on a deck 50 and a ball bearing 54 on a bottom plate 51. The capstan 53 extends through bearings 52a, 52b over the deck 50 and is adapted to cooperate with a pinch roller 56 within an endless magnetic tape cartridge 55 when the cartridge 55 is set in its operating position on the deck 50. A large and small capstan wheel or pulley 57, 58 are fixed to the capstan 53 between the deck 50 and the bottom plate 51. An electric motor 59 is mounted by a bracket 61 on the deck 50 to allow an armature shaft 60 to be parallel to the capstan 53 and to be positioned between the deck 50 and the bottom plate 51. Mounted on the armature shaft 60 are a small drive wheel or pulley 62 which is connected by a belt 64 with the large capstan wheel 57 and a large drive wheel or pulley 63 which is connected by a belt 65 to the small capstan wheel 58. A L-shaped swinging lever 66 is rotatably pivoted to a post 67 mounted on the bottom plate 51. An abutment or idler 69 is provided by a shaft 68 on the L-shaped swinging lever 66 at one end thereof and vertically extends between the belts 64 and 65. A spring 72 extends between the swinging lever 66 and a pin secured to the bottom plate 51. The idler 69 is normally engaged with the belt 64 at the outer side thereof. The swinging lever 66 is at one end thereof provided with a knob 70 and at one side thereof with a magnetic substance piece 73.

The knob 70 projects from a control panel (not shown) of the endless magnetic tape cartridge player (not shown) and is adapted to be manually operated. By manually rotating the swinging lever 66 (FIG. 4) counterclockwise by means of the knob 70 against the elasticity of the spring 72 the magnetic substance piece 73 is attractively engaged with an electromagnetic means 74 on the bottom plate 51. At this point, the idler 69 is away from the belt 64 at the outer side thereof and engages the belt 65 at the inner side thereof. Where the idler 69 engages the belt 64, the belt 64 is tensioned to impart rotation of the small drive wheel 62 to the large capstan wheel 57. Thus, the capstan 53 is rotated at low speed to drive the magnetic tape (not shown) within the tape cartridge 55 at normal speed. At this moment, the belt 65 is slackened to be slipped off the large drive wheel 63 and the small capstan wheel 58. On the contrary, where the idler 69 engages the belt 65, the latter is tensioned to impart rotation of the large drive wheel

63 to the small capstan wheel 58. By which, the capstan 53 is driven at fast speed to drive the magnetic tape at fast speed while the belt 64 is slackened to be slipped off the small drive wheel 62 and the large capstan wheel 57. The electromagnetic means 74 comprises a first coil 75a normally energized by the resistance 77 from an electrical source 76, as shown in FIG. 6 and a second coil 75b energized by the signal produced through a magnetic head 78, preamplifier 79, power amplifier 80, diode 85, resistance 86, condenser 87, and a sensor 88 when the nonrecord zone between the record zones on the endless magnetic tape cartridge (FIG. 4) passes through the magnetic head 78. The sensor 88 serves to function as the same as the sensor 48 in FIG. 3. Accordingly, when the swinging lever 66 is engaged by the electromagnetic means 74 to fast feed the tape, the nonrecord zone on the tape passes through the magnetic head 78 to allow the electromagnetic means 74 to disengage the swinging lever 66. As a result, the swinging lever 66 is returned to its original position by elasticity of the spring 72 to change over the tape from fast feed to normal speed. The output of a power amplifier 80 is applied through the emitter and collector electrode of a transistor, 81 to a speaker 84. The base and collector electrode of the transistor 81 are connected with each other through an electric switch 82 and a thermistor 83. The electric switch 82 operated by the swinging lever 66 is normally closed but is opened when the swinging lever 66 engages the electromagnetic means 74. In other words, it is opened as the magnetic tape is fast fed.

Transport of the tape at normal speed closes the switch 82 so that the base to collector current for the transistor 81 is flown to energize it to emit the reproducing sound from the speaker 84. On the other hand, transport of the tape at fast speed opens the switch 82 so that the base to collector current for the transistor 81 is not flown to cut off the transistor 81 not to emit the reproducing sound from the speaker 84. However, the second coil 75b of the electromagnetic means 74 is energized to allow the swinging lever 66 from the fast feed position to the normal feed position under the bias of spring 72, and the switch 82 is again closed. The transistor 81 is maintained cutoff until the resistance value of the thermistor 83 is lessened by self heating and the base to collector current is over the predetermined value. If the resistance value of the thermistor 83 is gradually lessened to energize the transistor allowing the reproducing sound to emit from the speaker 84. Initially, the volume output from the speaker 84 is little but increases as a so called "fade-in" in response to rising temperature of the thermistor 83. In the instance indicated by FIG. 3, there is such aspect that the abnormal sound is instantly emitted from the speaker 43 since the latter produces the reproducing sound upon changing over the tape from fast feed to normal feed. According to the arrangement shown in FIG. 6, there is an advantage to prevent production of such abnormal sound.

In FIG. 7, similar numerals, but primed, are used to illustrate the modification of the circuit shown in FIG. 6.

The output of a preamplifier 79' is applied through a diode 85', resistance 86', condenser 87', and a sensor 88' to a second coil 75b' and in turn applied through a transformer 89 to a power amplifier 80'. The power amplifier 80' is energized by an independent electrical source 90 through an electric switch 91 having three contacts 91a, 91b, and 91c and a resistance 92. By closing each of the contacts 91a, 91b and 91c of the electrical switch 91, a resistance 93 and a condenser 94 parallel connected to each other are electrically connected to the electrical source 90. The electric switch 91 shown in FIG. 7 is involved in a situation that when the tape is fast fed each of the contacts 91a, 91b and 91c is opened. The power amplifier 80' is not, therefore, operated so that the volume output is not emitted from a speaker 84'. By passing the nonrecord zone on the tape through a magnetic head 78', a second coil 75b' is energized and the swinging lever 66 (FIG. 5) is returned to its normal position. Then, the switch 91 is operated by the lever 66 to close each of the contacts 91a, 91b

and 91c. Even though the contacts 91a, 91b and 91c are closed, the amplifier 80' is not energized by the electrical source for the period of the time constant determined by a condenser 94 and a resistor 93 thereby the amplifier 80' is maintained in nonoperative condition. After the lapse of the time constant as set forth in the above, the power amplifier 80' is energized for its operation and the volume output is emitted from the speaker 84'. For this reason, the circuit shown in FIG. 7 serves to prevent the abnormal sound from emitting from the speaker 84' immediately after the tape has been changed over from fast feed to normal feed, as in the same manner of the circuit shown in FIG. 6. Manual manipulation of the swinging lever 66 (FIG. 5) changes over the magnetic tape from normal feed to fast feed to open each contacts 91a, 91b and 91c so that the power amplifier 80' is instantly deenergized and is brought in nonoperative condition to discharge the condenser 94 through the resistance 93.

FIG. 8 shows another embodiment in which the reproducing sound is faded in as the magnetic tape is changed over from fast feed to normal feed. Similar numerals, but primed, are used to designate the parts. A swinging lever 66' is connected through a wire 98 to an arm 97 secured to the top end of an operating shaft 96 of a rheostat 95 provided within a housing (not shown) of the tape player. The rheostat 95 serves to vary the amplification degree of a power preamplifier (not shown). A coil spring 99 is provided between a casing of the rheostat 95 and the operating shaft 96. A governor mechanism which comprises multiplying gears 101 and a wind mill 102 is connected through a sleeve 100 to the operating shaft 96. Counterclockwise manual rotation of the swinging lever 66' (FIG. 8) causes the operating shaft 96 of the rheostat 95 to be counterclockwise rotated through the wire 98 and the arm 97 to lower the amplification degree of a power amplifier (not shown). At this time, energy is stored in the coil spring 99. While the swinging lever 66' is engaged with an electromagnetic means 74' by a magnetic substance piece 73', namely, the magnetic tape is fast fed, the amplification degree of the power amplifier (not shown) is maintained in a low condition and the volume output from a speaker (not shown) does not substantially exist. Disengagement of the swinging lever 66' from the electromagnetic means 74' allows the former to be returned to its original position by elasticity of a spring 72' to normally feed the magnetic tape. On the other hand, the operating shaft 96 of the rheostat 95 is gradually returned to its original position by action of the coil spring 99 and the governor mechanism. Accordingly, the volume output from the speaker (not shown) is gradually increased upon normally feeding the tape.

The invention and its attendant advantages will be understood from the foregoing description. It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

1. In an endless magnetic tape cartridge player having a magnetic tape reproducing circuit including a magnetic head, a tape drive device for driving the endless magnetic tape within said cartridge, a deck for seating said cartridge, and a speaker for emitting sound upon receiving the output of the magnetic tape reproducing circuit, a tape speed control apparatus comprising:

- a rotary capstan for driving the tape within the cartridge and extending from the deck;
- an electrical motor for driving the capstan, said motor having an armature shaft;
- a first and a second speed reducing device having reduction ratios different from each other for imparting rotation of said armature shaft of the motor to the capstan;
- manually operated selecting means for operatively selecting either one of the first or the second speed reducing devices, said selecting means being movable between a first and a second position;
- bias means biasing said selecting means to said first position where said armature shaft of said motor is connected

through the first speed reducing device to said capstan, said tape being driven by said capstan at normal speed when said selecting means is biased to said first position; electromagnetic means for magnetically retaining said manually operated selecting means in said second position where said armature shaft of said motor is connected through said second speed reducing device to said capstan, said tape being driven by said capstan at fast speed when said selecting means is retained in said second position;

control means for automatically returning said selecting means from said second position to said first position including means for detecting a nonrecorded zone on said tape, means for producing an electrical signal in response to detection of said nonrecorded zone by said sensing means, and means for applying said electrical signal to said electromagnetic means, said electromagnetic means being adapted to release said retention of said selecting means when said electrical signal is received by said electromagnetic means; and

a control circuit for controlling the sound emitted from said speaker, said control circuit being operated by the movement of said selecting means to limit the sound from said speaker when said selecting means is in said second position.

2. Apparatus in accordance with claim 1 wherein said first speed reducing device comprises a drive pulley mounted on said armature shaft of said motor, a capstan pulley mounted on said capstan, and a belt trained between said drive pulley and said capstan pulley; said second speed reducing device comprises a drive wheel mounted on said armature shaft, a capstan wheel mounted on said capstan coaxially with said capstan pulley, and an idler wheel interposed between said drive wheel and said capstan wheel; and said selecting means includes a slide member having a shaft rotatably supporting said idler wheel, said idler wheel being rotatably provided on said shaft and opposed to said belt, and a manually operated pivotally movable lever connected to said slide member; said idler pulley being adapted to abut against said belt to tension said belt for imparting rotation of said drive pulley to said capstan pulley when said selecting means is positioned in said first position, said idler wheel being adapted to engage said drive wheel and said capstan wheel for imparting rotation of said drive wheel to said capstan when said selecting means is positioned in said second position.

3. Apparatus in accordance with claim 2 wherein said electromagnetic means includes a normally energized first coil, a second coil, means for supplying current to said second coil, said current supply means being controlled by said control means, said coils being arranged such that the magnetic flux produced in said first coil is erased by the magnetic flux produced in said second coil when said second coil is energized.

4. Apparatus in accordance with claim 1 wherein said first speed reducing device comprises a small drive wheel mounted

on said armature shaft of said motor, a large capstan wheel mounted on said capstan, and a first belt provided between said small drive wheel and said large capstan wheel; said second speed reducing device comprises a large drive wheel mounted on said armature shaft, a small capstan wheel on said capstan, and a second belt provided between said large drive wheel and said small capstan wheel; and said selecting means includes a manually operated pivotally movable lever, a belt abutment extending between said first belt and said second belt mounted on said lever, said belt abutment being adapted to abut against said first belt to tension said first belt for imparting rotation of said small drive wheel to said large capstan wheel when said selecting means is positioned in said first position, said belt abutment being adapted to abut against said second belt to tension said second belt for imparting rotation of said large drive wheel to said small capstan wheel when said selecting means is positioned in said second position.

5. Apparatus in accordance with claim 4 wherein said control circuit includes a transistor provided with base, emitter and collector electrodes and located between a magnetic tape reproducing circuit and said speaker, a thermistor for controlling the base voltage of said transistor, and an electric switch in series with said transistor and said thermistor, said switch being normally closed when said selecting means is positioned in said first position and being adapted to be opened when said selecting means is positioned in said second position.

6. Apparatus in accordance with claim 4 wherein said control circuit comprises an electrical source for a power amplifier in the magnetic tape reproducing circuit, an electrical switch operable by said selecting means and provided between said electrical source and said power amplifier, a condenser and a resistance both connected in parallel with said power amplifier through said electrical switch, said switch being closed when said selecting means is positioned in said first position, said power amplifier, condenser, and said resistance each being electrically connected to said electrical source when said switch is closed, said switch being opened when said selecting means is positioned in said second position, the parallel connection of said electrical source, power amplifier, condenser, and said resistance each electrically being cut off when said switch is opened.

7. A tape fast feed control apparatus in an endless magnetic tape cartridge in accordance with claim 4 wherein said control circuit comprises a rheostat for controlling the output of said magnetic tape reproducing circuit, said rheostat having an operating shaft, a coil spring for rotatably driving the operating shaft of said rheostat, a governor device controlling the rotating speed of said operating shaft, an arm secured to said operating shaft, and a wire coupling said arm to said lever of said selecting means, said rheostat being adapted to be gradually varied to the direction which increases the output of said reproducing circuit by changing said selecting means from said second position to said first position.

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