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(54) VIDEO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

(71) We, NIPPON VICTOR KABUSHIKI KAISHA, of No. 12, 3-Chome, Moriya-Cho, Kanagawa-Ku, Yokohama-City, Kanagawa-Ken, Japan, a Japanese Corporation, 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:—

The present invention relates generally to video signal recording and/or reproducing apparatuses, and more particularly to a video signal recording and/or reproducing apparatus in which a recording tape which has been drawn out of a cassette and loaded to lie in a specific tape travel path is caused to travel stably along the travel path.

In general, video signal recording and/or reproducing apparatus, particularly those for use in homes are being miniaturized. For this reason, the tape travel paths are becoming short, but there is no change in their complexity. One result is that the wrapping angles of the tape around the tape guide members have increased, and this gives rise to fluctuations in the tape travel. For this reason, stabilization of the tape travel is particularly desired in a miniaturized video signal recording and/or reproducing apparatus.

Furthermore, there is a demand for lengthening of the recording and reproducing time for a predetermined tape quantity. In view of this demand, the present applicant has used the new "Color video signal recording and reproducing system", which the same applicant previously proposed in British Patent Application No. 42366/76, now British Patent No. 1,506,087, with a tape travel speed lowered to approximately one half the conventional speed and have succeeded in achieving good recording and reproducing of video signals. However, as the tape travel speed becomes lower, the effect of tape travel fluctuation becomes greater.

When there is a fluctuation in the tape travel speed, jitter appears in the repro-

duced picture, which thereby becomes poor. Accordingly, there is a particular requirement for stabilization of the tape travel in a video signal recording and/or reproducing apparatus which has undergone overall miniaturization, and in which, moreover, the tape travel speed has been lowered.

The present invention provides a video signal recording and/or reproducing apparatus comprising: a guide drum having at least one rotating head for recording and/or reproducing video signals; loading means for drawing out a tape accommodated within a cassette from said cassette and loading said tape in a specific tape travel path including a part thereof wherein the tape is in wrapping contact with said guide drum over a predetermined expanse thereof; and at least one impedance roller for contacting the tape thus loaded in said predetermined tape travel path. The impedance roller is preferably provided in the vicinity of the position of the loading means upon completion of the moving operation thereof for loading.

A preferred video signal recording and/or reproducing apparatus is provided with one or more impedance rollers for contacting the tape in its travel path. By this provision, the tape travels in a stable manner even when it is traveling through a complicated tape travel path at a low tape travel speed.

Another preferred video signal recording and/or reproducing apparatus is provided with one or more impedance rollers for stabilizing the tape travel, which impedance rollers are so adapted that they do not interfere with the operation of the means for drawing the tape out of the cassette and loading the tape into the predetermined tape travel path and, moreover, contact the tape thus loaded.

The present invention will be further described, by way of example, with reference to the accompanying drawings, in which:—

FIG. 1 is a plan view showing a first embodiment of a video signal recording and/

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or reproducing apparatus according to the present invention;

FIG. 2 is a plan view showing mechanism parts which operate in response to the manipulation of a PLAY lever;

FIG. 3 is a perspective view showing mechanical elements constituting a portion of the mechanical parts shown in FIG. 2;

FIG. 4 is a plan view showing mechanism parts for driving a tape loading means;

FIG. 5 is a plan view showing an essential part of an apparatus according to the present invention in a state where tape loading has been completed;

FIG. 6 is an elevation showing a loading pole and a guide pole;

FIG. 7 is an elevation showing stop member;

FIG. 8 is a plan view showing a second embodiment of a video signal recording and/or reproducing apparatus according to the present invention in a state where tape loading has been completed;

FIG. 9 is a plan view showing a tape loading mechanism and an impedance roller shifting mechanism in the apparatus shown in FIG. 8; and

FIG. 10 is a plan view showing mechanism parts for driving the mechanism parts shown in FIG. 9.

Upon recording or reproducing operation, a cassette (cartridge) 10 is placed in a loading position in the recording-reproducing apparatus as indicated by two-dot chain line in FIG. 1. Guide poles 11 and 13, guide rollers 12 and 14, a tension pole 16 provided on a tension arm 15, and a capstan 49 respectively enter relatively through an opening in the bottom of the cassette 10 and fit into the interior thereof. These members thus fitted are disposed on the inner side, that is, on the side confronting the non-magnetic surface. A magnetic tape 23 is guided by guide poles 20, 21, and 22 in its span between a tape supply roll 18 and a tape take-up roll 19 on the take-up side. The magnetic surface of the tape faces the front of the cassette 10.

When the cassette 10 is placed in its operational position, a supply reel and a take-up reel (neither being shown) on which the tape rolls 18 and 19 are respectively wound within the cassette 10, respectively fit onto a supply side reel disc 24 and a take-up side reel disc 25.

Then, when a PLAY button 26 is pushed, a lever 27 is caused to slide in the arrow direction A, whereby a lever 29 is rotated through a pin 28 in the clockwise direction about a shaft 30. As one result of this rotation of the lever 29, a lever 32 is caused to rotate through a rod 31 in the counterclockwise direction, whereby a lever 34 is released from engagement by a pin 33 and is thereby rotated in the clockwise direction

by the tension force of a spring 35. As another result of the rotation of the lever 29, a lever 37 is caused to turn through a rod 36 in the clockwise direction about a shaft 38. As the lever 37 turns clockwise, a pin 40 embeddedly fixed to a lever 39 is released from engagement by the lever 37, whereby the lever 39 rotates in the counterclockwise direction about a shaft 42 as a result of tension force of a spring 41, whereupon an eccentric gear 43 provided on the lever 39 is meshed with a gear 44.

On the other hand, as a result of the pushing of the PLAY button 26, a switch (not shown) is closed to start a motor 45, whereby a rotating shaft 46 rotates in the clockwise direction. The rotation of this shaft 46 is transmitted through a belt 47 to a fly-wheel 48, whereupon the capstan 49 rotates, and, further, the rotation of the capstan 49 is transmitted by way of gears 50 and 51 to the gear 44, which is thereby rotated in the clockwise direction at a reduced rotational speed.

The eccentric gear 43 which has meshed with the gear 44 as described hereinbefore is caused to rotate counterclockwise about a rotational shaft 52 by the rotation of the gear 44. Interrelatedly with the rotation of the eccentric gear 43, the lever 39 rotates in the clockwise direction counter to the force of the spring 41. The pin 40 also moves in the clockwise direction interrelatedly with the above described revolution, whereby a stop member 54 which is rotatably supported on the lever 37 by a shaft 53, as clearly indicated in FIG. 3, is caused to turn counterclockwise by the pin 40 counter to the force of a spring 55. When the eccentric gear 43 further rotates to a position slightly short of the rotational position where the maximum radius part thereof meshes with the gear 44, the pin 40 passes over the distal end of the stop member 54 and reaches the outside thereof. Consequently, the stop member 54 is turned to the original position by the force of the spring 55 and thereby operates to prevent the shift of the pin 40 in the counterclockwise direction.

As the radius of the eccentric gear 43 at a part where it meshes with gear 44 begins to decrease as the eccentric gear 43 rotates further, the eccentric gear 43 is separated from the gear 44 because the lever 39 has already been restricted in its counterclockwise rotation by the pin 40 and the stop member 54.

On the other hand, the turning of the lever 39 in the clockwise direction causes, as indicated in FIG. 4, levers 60 and 61 engaged with the lever 39 at the distal end thereof to slide respectively in the arrow direction B. As a result of this sliding movement of the lever 60, a lever 62 turns

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clockwise about a shaft 63, and a lever 64 thereby moves in the arrow direction C. Consequently, a rotatable lever 65 provided with the pole 11 and the roller 12 at the distal end thereof turns in the counterclockwise direction about the shaft 66. Moreover, as a result of the sliding movement of the lever 61, a lever 67 turns counterclockwise about a shaft 68, and a lever 69 thereby moves in the arrow direction D. Consequently, a rotatable lever 70 provided with the pole 13 and the roller 14 at a distal end thereof turns in the clockwise direction about a shaft 71.

Interrelatedly with the respective rotations of the levers 65 and 70 in the counterclockwise and clockwise directions, the guide poles 11 and 13 respectively with the guide rollers 12 and 14 intercept the magnetic tape 23 and, drawing this tape out of the cassette 10 through an opening at its front surface, move the tape 23 along slots 72 and 73 (shown by two-dot chain line) formed in the chassis until the tape reaches a specific position as indicated in FIG. 5.

The shafts 63 and 68 are respectively provided on levers 75 and 78, which are pivoted respectively on pins 74 and 77 and limited in the range of their rotations by stop members 76 and 79. A spring 80 is stretched between the levers 75 and 78. This mechanism absorbs excessive movements of the levers 60 and 61, whereby the levers 65 and 70 are prevented from mixing excessively.

As a result of the rotation of the lever 70, the lever 15 (FIG. 2) is released from its locked state due to a stepped part 81 of the lever 70, and is thereupon turned counterclockwise by the force of a spring 82. As a consequence, the guide pole 16 defines the tape travel path.

Referring to FIG. 4, as a result of the clockwise rotation of the lever 39, a pin 83 embeddedly fixed thereto also moves unitarily therewith, and, at the same time, a lever 84 is moved in the arrow direction E by the force of a spring 85. As a consequence, a lever 86 rotates in the counterclockwise direction about a pin 87, and a pinch roller 88 presses against the capstan (17 in FIG. 5) over the tape 23.

Referring again to FIG. 2, when the PLAY button 26 is pressed, this movement is transmitted through an intercoupling mechanism to cause a lever 91 to slide in the arrow direction A. The leading end of this lever 91 thereby pushes against a pin 92 fixed to a lever 93, which thereupon rotates clockwise about a pin 95 counter to the force of a spring 94. As a consequence, a brake shoe 96 separates from the reel support disc 25, which is thereupon released from its braked state. As another result of the sliding movement of the lever

91, an inclined part 97 thereof pushes a pin 98 fixed to the distal end of a lever 99, which thereupon rotates clockwise about a shaft 100. This rotation causes a roller 101 to separate from the reel support disc 24 counter to the force of a spring 102, thereby releasing the reel disc 24 from its braking action.

As still another result of the pressing of the PLAY button 26, this movement is transmitted through an intercoupling mechanism to cause a lever 103 to slide in the arrow direction F, and a lever 105 is released from its locked state due to a lock lever 104. The lever 105 is therefore forced by a spring 106 to slide in the arrow direction A, whereby a pin 108 fixed to a lever 107 is released from its locked state due to the lever 105, whereupon the lever 107 is turned counterclockwise by the force of a spring 109. As a consequence, a roller 110 is pressed into contact with the reel disc 25. This roller is being driven in rotation by the motor 45 through a belt 111 and a pulley 112. Consequently, the reel disc 25 thus contacted by this roller 110 is rotated clockwise and drives the takeup reel so as to wind up the tape.

The essential parts of the apparatus of the present invention will now be described in conjunction with FIG. 5. An impedance roller 120 is rotatably supported by a plate 122, which is pivoted on a pin 121. The plate 122 is urged to rotate in the counterclockwise direction by a spring 123 but is limited in this rotation at the position indicated in FIG. 5 by a stop mechanism 124 in the form of an adjusting screw. Another impedance roller 125 is rotatably supported on a plate 127 pivoted on a pin 126. The plate 127 is urged to rotate in the counterclockwise direction by a spring 128 but is limited in this rotation at the position indicated in FIG. 5. The impedance rollers 120 and 125 are shown in FIG. 5 to be in states wherein they have entered into the paths of movement of the guide rollers 12 and 14.

As described hereinabove, as the levers 65 and 70 rotate, the pole 11 and roller 12 and the pole 13 and roller 14 move within the slots 72 and 73 while engaging the tape 23. As they approach the end of this movement, the rollers 12 and 14 are pressed into contact against the impedance rollers 120 and 125 and move further to push these rollers aside. The impedance rollers 120 and 125 are thus pushed by the rollers 12 and 14, and the plates 122 and 127 respectively rotate temporarily in the clockwise direction but, as the rollers 12 and 14 pass by, these plates are again returned to their original position by the forces of the springs 123 and 128.

The roller 12 has shaft parts 129a and 129b projecting upward and downward through a bracket 130 as shown in FIG. 6, 130

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which shaft parts strike against and are engaged by stop parts 132a and 132b, Fig. 7, of a stop member 131, whereby the roller 12 is stopped in its movement at this position. The roller 14 and a stop member 139 have a construction and interrelation similar to those of the roller 12 and the stop member 131, and the roller 14 is also stopped by the stop member 139. With these mechanisms in this state, the automatic loading of the tape 23 into its predetermined tape travel path is completed. The tape 23 is wrapped around the cylindrical surface of a guide drum 133 having rotating video heads (not shown) over a predetermined angular expanse defined by the poles 11 and 13.

The above mentioned bracket 130 is supported in a manner permitting its up-and-down rotation through a projection 134 thereof by a support structure 135 as shown in FIG. 6. Furthermore, springs 136a and 136b are interposed between the bracket 130 and the support structure 135. The pole 11 is embeddedly fixed at its root part to an inclined base 137 provided integrally with the support structure 135 on the end of the lever 65. The pole 13 and the roller 14 are also of similar construction. Since the orientation of the tape is changed by a mechanism comprising inclined poles and upright rollers, there is no need of using conical guide poles, whereby the production, installation, and adjustments are facilitated.

At the time of completion of the above mentioned automatic tape loading, the tape 23 drawn out from the tape roll 18 on the tape-supply side contacts tension poles 140 and 16, a guide pole 141, an a full-width erasing head 142 and thereafter comes into contact with the above described impedance roller 125. The tape 23 is further guided and changed in direction by the guide roller 14, a guide 143 for determining tape position, and the guide pole 13 and is placed in wrapping contact in helical form around the guide drum 133. While the tape 23 is thus in wrapping contact with the guide drum 133, a video signal is recorded thereon or reproduced therefrom by the rotating video heads.

After becoming unwrapped from the guide drum 133, the tape 23 is guided and changed in direction by the guide pole 11, a guide 138 for determining tape position, and the guide roller 12. Then, after contacting the above described impedance roller 120, the tape 23 contacts a recording and reproducing head 144 for audio signals and control signals and a guide pole 145. The tape 23 thereafter is clamped and driven by the pinch roller 88 and the capstan 17, enters into the cassette 10 and is wound up on the tape roll 19 on the tape take-up side. The guide drum 133 is inclined by a specific angle

relative to the chassis, and the path of wrapping contact of the tape 23 around the cylindrical surface of the guide drum is parallel to the chassis and, at the same time, is of helical form relative to the rotating surface of the rotating heads of the guide drum 133.

The impedance rollers 120 and 125 are provided at positions which are close as possible to the guide drum 133, that is, at positions in the vicinity of the guide rollers 12 and 14.

As the tape 23 travels through the above described tape travel path, very minute fluctuations in the tape travelling speed are suppressed by the inertial rotation of the impedance rollers 125 and 20, whereby the tape travel is rendered remarkably stable.

It is to be observed that the positions of the above described plate 122 and the impedance roller 120 can be adjusted by adjusting the adjusting screw of the stop device 124. By this adjustment it is possible to adjust the position of the tape 23 contacting the impedance roller 120 and to adjust the length of the tape travel path between the guide drum 133 and the audio signal and control signal recording and reproducing head 144. By this adjusting procedure, the tape travel path length can be set at the optimum value in correspondence with the relative positions of the audio signal and the control signal on the tape. Therefore, when a tape which has been recorded in one recording and reproducing apparatus is reproduced in another recording and reproducing apparatus of the same kind, excellent reproduction is achieved by carrying out the above described adjustments, and a high degree of interchangeability is afforded.

Next, a second embodiment of a video signal recording and/or reproducing apparatus according to the present invention will be described in conjunction with FIGS. 8, 9 and 10. Parts in FIGS. 8 through 10 which are the same as corresponding parts in FIGS. 1 through 7 are designated by like reference numerals, and detailed description of such parts will not be repeated.

The impedance roller 120 is rotatably supported on a support arm 151 which is provided coaxially together with an associated actuating arm 150. When the apparatus is in the stop mode, the actuating arm 150, with its cam part engaged by a roller 152, is being rotated about a shaft 153 to a position indicated by two-dot chain line in FIG. 9. The impedance roller 120 is therefore retracted to a position outside of the moving paths of the guide pole 11 and guide roller 12 during the loading mode.

The other impedance roller 125 is rotatably supported on a support arm 155 which is provided coaxially together with an associated actuating arm 154. In the stop mode

of the apparatus, the actuating arm 154 is being rotated about a shaft 157 by the tensile force of a coil spring 156 to a position indicated by two-dot chain line in FIG. 9, whereby the impedance roller 125 is also retracted to a position outside of the moving paths of the guide pole 13 and guide roller 14 during the loading mode. The actuating arm 154 is provided, at the distal side thereof, with the full-width erasing head 142 and the guide pole 141, and its cam part is in contact with a roller 158.

When the PLAY button is pressed, this movement is transmitted through an inter-coupling mechanism to rotate a lever 160 as shown in FIG. 10 in the clockwise direction, and a lever 161 is released from its locked state due to a pin 162 provided on the lever 160 and is rotated counterclockwise about a shaft 164 by the force of a spring 163. This causes a gear 165 rotatably supported on the distal end of the lever 161 to mesh with a gear 166 provided coaxially with the capstan 17. As a consequence, the rotation of the gear 166 is transmitted by way of the gear 165 and gears 167 and 168 to a gear 169.

As the gear 169 rotates counterclockwise, a cam structure 170 approximately fan shape is compulsorily rotated clockwise with respect to a shaft 172, its surface 170a being guided by an actuating pin 171 embeddedly fixed at its root part to the lower surface of the gear 169. When the gear has rotated through approximately one half revolution, it is locked by the action of a circular cam structure 173 and a roller 174. At the same time, the lever 160 rotates, and the gear 168 separates from the gear 169. Furthermore, the cam structure 170 reaches its final rotational position as indicated by single-dot chain line in FIG. 9.

Together with the rotation of the cam structure 170 up to the vicinity of the above mentioned final rotational position, a rotating lever 176 is caused through a pair of coupling levers 175a and 175b connected by a spring to rotate clockwise about a shaft 177. In addition, the rotating levers 65 and 70 are caused through coupling levers 178 and 179 and an arm 180 to rotate respectively counterclockwise and clockwise to positions indicated by single-dot chain line in FIG. 9, that is, the positions indicated in FIG. 8. As a consequence of this action, tape loading is carried out in substantially the same manner as in the case of the afore-described embodiment of the invention. During this tape loading operation, the above mentioned impedance rollers 120 and 125 are still in their retracted positions, and the guide rollers 12 and 13 move smoothly without colliding respectively with the impedance rollers 120 and 125.

When the cam structure 170 rotates fur-

ther to its terminal position, a roller 182 supported on an L-shaped arm 181 is guided by an inclined cam surface 170b of the cam structure 170, and the arm 181 thereby rotates counterclockwise about a pin 183. This rotation of the arm 181 is transmitted through a coupling arm 184 to cause another L-shaped arm 185 to rotate clockwise about a pin 186. The afore-described rollers 152 and 158 are respectively provided on these L-shaped arms 181 and 185.

As a result of the above described rotation of the L-shaped arm 181, the actuating arm 150 is engaged and guided by the roller 152 and rotates clockwise, and the impedance roller 120 contacts the tape 23 in the vicinity of the outlet side with respect to the guide drum 133 as viewed in the direction of tape travel. Furthermore, as a result of the above described rotation of the other L-shaped arm 185, the actuating arm 154 is engaged and guided by the roller 158 and rotates counterclockwise counter to the force of the spring 156, and the impedance roller 125 contacts the tape 23 in the vicinity of the inlet side with respect to the guide drum 133 as viewed in the tape travel direction.

When the STOP button is manipulated at the time of reproducing mode of operation, the gear 169 rotates through approximately one half revolution similarly as at the time when the PLAY button is pressed as described above, and the cam structure 170 rotates counterclockwise to its position indicated by full line in FIG. 9. As a result of the return action of the cam structure 170, the impedance rollers 120 and 125 initially return to their original retracted positions. Then the guide poles 11 and 13 and the guide rollers 12 and 14 move, in the direction opposite to that at the time of tape loading, without colliding with the impedance rollers 120 and 125 and return to their original positions indicated by two-dot chain line in FIG. 9.

Further, this invention is not limited to these embodiments but various variations and modifications may be made without departing from the scope of the invention as defined in the appended claims.

WHAT WE CLAIM IS:—

1. A video signal recording and/or reproducing apparatus comprising:

a guide drum having at least one rotating head for recording and/or reproducing video signals;

loading means for drawing out a tape accommodated within a cassette from said cassette and loading said tape in a specific tape travel path including a part thereof wherein the tape is in wrapping contact with said guide drum over a predetermined expanse thereof; and

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of the apparatus, the actuating arm 154 is being rotated about a shaft 157 by the tensile force of a coil spring 156 to a position indicated by two-dot chain line in FIG. 9, whereby the impedance roller 125 is also retracted to a position outside of the moving paths of the guide pole 13 and guide roller 14 during the loading mode. The actuating arm 154 is provided, at the distal side thereof, with the full-width erasing head 142 and the guide pole 141, and its cam part is in contact with a roller 158.

When the PLAY button is pressed, this movement is transmitted through an inter-coupling mechanism to rotate a lever 160 as shown in FIG. 10 in the clockwise direction, and a lever 161 is released from its locked state due to a pin 162 provided on the lever 160 and is rotated counterclockwise about a shaft 164 by the force of a spring 163. This causes a gear 165 rotatably supported on the distal end of the lever 161 to mesh with a gear 166 provided coaxially with the capstan 17. As a consequence, the rotation of the gear 166 is transmitted by way of the gear 165 and gears 167 and 168 to a gear 169.

As the gear 169 rotates counterclockwise, a cam structure 170 approximately fan shape is compulsorily rotated clockwise with respect to a shaft 172, its surface 170a being guided by an actuating pin 171 embeddedly fixed at its root part to the lower surface of the gear 169. When the gear has rotated through approximately one half revolution, it is locked by the action of a circular cam structure 173 and a roller 174. At the same time, the lever 160 rotates, and the gear 168 separates from the gear 169. Furthermore, the cam structure 170 reaches its final rotational position as indicated by single-dot chain line in FIG. 9.

Together with the rotation of the cam structure 170 up to the vicinity of the above mentioned final rotational position, a rotating lever 176 is caused through a pair of coupling levers 175a and 175b connected by a spring to rotate clockwise about a shaft 177. In addition, the rotating levers 65 and 70 are caused through coupling levers 178 and 179 and an arm 180 to rotate respectively counterclockwise and clockwise to positions indicated by single-dot chain line in FIG. 8, that is, the positions indicated in FIG. 9. As a consequence of this action, tape loading is carried out in substantially the same manner as in the case of the afore-described embodiment of the invention. During this tape loading operation, the above mentioned impedance rollers 120 and 125 are still in their retracted positions, and the guide rollers 12 and 13 move smoothly without colliding respectively with the impedance rollers 120 and 125.

When the cam structure 170 rotates fur-

ther to its terminal position, a roller 182 supported on an L-shaped arm 181 is guided by an inclined cam surface 170b of the cam structure 170, and the arm 181 thereby rotates counterclockwise about a pin 183. This rotation of the arm 181 is transmitted through a coupling arm 184 to cause another L-shaped arm 185 to rotate clockwise about a pin 186. The afore-described rollers 152 and 158 are respectively provided on these L-shaped arms 181 and 185.

As a result of the above described rotation of the L-shaped arm 181, the actuating arm 150 is engaged and guided by the roller 152 and rotates clockwise, and the impedance roller 120 contacts the tape 23 in the vicinity of the outlet side with respect to the guide drum 133 as viewed in the direction of tape travel. Furthermore, as a result of the above described rotation of the other L-shaped arm 185, the actuating arm 154 is engaged and guided by the roller 158 and rotates counterclockwise counter to the force of the spring 156, and the impedance roller 125 contacts the tape 23 in the vicinity of the inlet side with respect to the guide drum 133 as viewed in the tape travel direction.

When the STOP button is manipulated at the time of reproducing mode of operation, the gear 169 rotates through approximately one half revolution similarly as at the time when the PLAY button is pressed as described above, and the cam structure 170 rotates counterclockwise to its position indicated by full line in FIG. 9. As a result of the return action of the cam structure 170, the impedance rollers 120 and 125 initially return to their original retracted positions. Then the guide poles 11 and 13 and the guide rollers 12 and 14 move, in the direction opposite to that at the time of tape loading, without colliding with the impedance rollers 120 and 125 and return to their original positions indicated by two-dot chain line in FIG. 9.

Further, this invention is not limited to these embodiments but various variations and modifications may be made without departing from the scope of the invention as defined in the appended claims.

WHAT WE CLAIM IS:—

1. A video signal recording and/or reproducing apparatus comprising:
a guide drum having at least one rotating head for recording and/or reproducing video signals;

loading means for drawing out a tape accommodated within a cassette from said cassette and loading said tape in a specific tape travel path including a part thereof wherein the tape is in wrapping contact with said guide drum over a predetermined expanse thereof; and



at least one impedance roller for contacting the tape thus loaded in said predetermined tape travel path.

2. A video signal recording and/or reproducing apparatus as claimed in claim 1 in which said impedance roller is provided in the vicinity of the position of said loading means upon completion of the moving operation thereof for loading.

3. A video signal recording and/or reproducing apparatus as claimed in claim 1 which further comprises: holding means for holding said impedance roller in a freely rotatable manner and, moreover, in a manner permitting displacement of the impedance roller between a contacting position at which it contacts the tape loaded in the predetermined tape travel path and a retracted position to which it retracts from said contacting position; and biasing means for urging said holding means in the direction of movement from said retracted position to said contacting position; and at the time of tape loading operation of said loading means, said impedance roller being actuated by said loading means to retract temporarily thereby not to interfere with the loading operation of said loading means.

4. A video signal recording and/or reproducing apparatus as claimed in claim 1 which further comprises: means for adjusting the position at which said impedance roller contacts the tape; and a control head for recording or reproducing a control signal on or from the tape, said impedance roller being provided in said predetermined tape travel path at a position between said guide drum and said control head.

5. A video signal recording and/or reproducing apparatus comprising:
a guide drum having at least one rotating head for recording and/or reproducing of video signals;

loading means having a pair of tape loading and guiding means for drawing a tape out of a cassette accommodating a supply-side tape roll and a takeup-side tape roll, loading the tape in a predetermined tape travel path wrappingly contacting said guide drum over a predetermined expanse thereof, and guiding the tape after loading;

an erasing head provided in said tape travel path between one of said tape loading and guiding means and said supply-side tape roll;

a first impedance roller provided in said tape travel path between said one tape loading and guiding means and said erasing head; tape driving means provided in said tape travel path between the other tape loading and guiding means and said takeup-side tape roll;

a control head for control signal recording and reproducing provided in said tape travel path between said other tape loading and guiding means and said tape driving means; and

a second impedance roller provided in said tape travel path between said other tape loading and guiding means and said control head.

6. A video signal recording and/or reproducing apparatus as claimed in claim 1 which further comprises: holding means for holding said impedance roller in a freely rotatable manner and, moreover, in a manner permitting displacement of the impedance roller between a contacting position at which it contacts the tape loaded in said specific tape travel path and a retracted position to which it retracts from said contacting position; driving means for driving said loading means in the loading operation thereof; and means operating interrelatedly with said driving means to operate said holding means in a manner such that said impedance roller is at a position retracted from the path of movement of said loading means during the operation of said loading means and moves responsively to the completion of operation of loading means to a position for contacting said tape.

7. A video signal recording and/or reproducing apparatus substantially as hereinbefore described with reference to Figures 1 to 7 or Figures 8 to 10 of the accompanying drawings.

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PATENTS ACT 1949

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The following amendments were allowed under Section 29 on 6 March 1979:-

Page 2, lines 37, 84 and 86, *delete 49 insert 17*

Page 5, line 39, *delete 168 and 169 insert 165 and 166 substitute Fig 1 on Sheet 1
Fig 2 on Sheet 2, Fig 8 on Sheet 5 for following drawings.*

