

VIDEO TAPE DECK AND METHOD OF OPERATION

DESCRIPTION

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The present invention relates to a video tape deck and a method of operation. The present invention is particularly applicable to camcorders.

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Generally, camcorders are classified into two types, i.e., a single chassis type and a double chassis type. The single chassis type camcorder includes a drum having a head for recording and reproducing signals on a tape, a loading mechanism for loading the tape to the drum, two reels for mounting the tape thereon, and a driving device for driving the loading mechanism and the reels. However, since all the components, including the above elements, are arranged on the single chassis, the deck is undesirably large for use in a camcorder.

On the other hand, in the double chassis type camcorder consisting of a main chassis and a sub-chassis, the components which are required to record and reproduce the signals on the tape are separately arranged on the main
5 chassis and the sub-chassis, so that a reduction of the deck size may be accomplished. However, since the drum is mounted with an inclined angle at a predetermined position on the main chassis and the sub-chassis is slidably provided on the main chassis to load the tape,
10 the height of the deck is increased by an amount determined by the inclination of the head. Further, when the sub-chassis closely approaches to the drum, there is a possibility that the tape case may come into contact with the drum. Therefore, there is the problem that
15 conventional decks are too large in height and length, so that camcorders are undesirably large.

According to the present invention there is provided a video tape deck comprising a main chassis, a sub-chassis
20 movable relative to the main chassis between a tape loading position and a tape playing position, a head drum mounted on the main chassis, first and second guide means provided on the main chassis on respective sides of the head drum, third and fourth guide means provided on the
25 sub-chassis and arranged to create first and second combined guide means with the first and second guide means respectively when the sub-chassis is moved into the tape playing position, and first and second pole bases

mounted on the sub-chassis for loading a tape onto the head drum by being guided along respective combined guide means, wherein the first guide means is provided with a branching portion for receiving a pole base so as to allow rotation thereof during tape loading, such that a tape-guiding pole thereon is brought towards the head drum.

Preferably, the drum is forty millimeters in diameter.

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

15 Figure 1 is a plan view illustrating a deck of a camcorder according to the present invention;

Figure 2 is a plan view illustrating a main chassis according to the present invention;

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Figure 3 is a plan view illustrating a sub-chassis according to the present invention;

Figure 4 is a timing chart illustrating operating states according to the present invention;

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recording on the tape; and a standby step for stopping a take-up reel and a supply reel and for moving the pinch roller apart from the capstan shaft to stop the playing back step and select a desired step.

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

10 Figure 1 is a plan view illustrating a deck of a camcorder according to the present invention;

Figure 2 is a plan view illustrating a main chassis according to the present invention;

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Figure 3 is a plan view illustrating a sub-chassis according to the present invention;

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Figure 4 is a timing chart illustrating operating states according to the present invention;

Figure 5 is a schematic plan view illustrating a tape travelling mechanism; and

5 Figures 6A to 6F are views illustrating the operating states of an apparatus according to the present invention;

Figure 6A is an operating view of an idler;

10 Figure 6B is an operating view of the sub-chassis;

Figure 6C is an operating view of a guide lever, a pinch roller and a review arm;

15 Figure 6D is an operating view of pole bases;

Figure 6E is an operating view of a braking device for braking a supply reel and a take-up reel; and

20 Figure 6F is an operating view of a tension pole.

Referring to Figures 1 to 3, a sub-chassis 200 is movably provided on a main chassis 100. An inclined drum 10 is forward mounted on the main chassis 100. The inclined drum 10 has, for example, an inclined angle of ten degrees to a line perpendicular to the main chassis.

Further, a travelling mechanism is arranged around the inclined drum 10 in the sequence of a tension pole 11 --> a lever guide roller 12 --> a first inclined pole 13 --> a first inclined guide roller 14 --> a second inclined guide roller 15 --> a tape-guiding pole 16 --> an inclined drum 10 --> a second inclined pole 17 --> a third inclined guide roller 18 --> a third inclined pole 19 --> a capstan shaft 20 --> a review arm pole 21, so as to guide a tape 22 about the inclined drum 10, as shown in Figure 5.

The tension pole 11 and the lever guide roller 12, as shown in Figures 1 and 3, are formed on respective front ends of a tension arm 26 and a guide lever 96 which are provided on the sub-chassis 200. More particularly, the tension pole 11 is positioned at the

outside of the tape 22 (see Figure 5), released from a supply reel 110, to push against the outer surface of the tape 22. The first inclined pole 13 and the first inclined guide roller 14 are fixedly formed on a base 23 which is provided on the main chassis 100, so as to guide the tape 22 in an inclined direction with a predetermined angle guided by the lever guide roller 12.

Further, as shown in Figures 1 to 3, the second inclined guide roller 15 and the tape-guiding pole 16 are formed on a pole base 24, and the second inclined pole 17 and the third inclined guide roller 18 are formed on a pole base 24a. The pole bases 24 and 24a are guided along each loading groove 55. The tape 22, which is guided through the inclined poles and rollers, is wound around a take-up reel via the third inclined pole 19, the capstan shaft 20 and the review arm pole 21. The inclined pole 19 and the capstan shaft 20 are formed on a capstan base 25.

Hereinafter, the main chassis 100 and the sub-chassis 200 will be explained, with reference to Figures 2 and 3.

5 As shown in Figure 2, the inclined drum 10 is forward mounted on an upper middle portion of the main chassis 100 and has an inclined angle of ten degrees. Guide rails 51 and 52, each having a loading groove 55, are provided on either side of the drum 10 to guide the
10 tape.

A loading motor 30 and power transferring device driven by the loading motor 30 are provided on the main chassis 100. A capstan motor 40 to the right of the
15 drum 10 for moving the tape, a cam lever 39 driven by a first cam gear 33 of the power transferring device, a plate slider 27 and a sub-chassis moving cam lever 28 actuated by a second cam gear 35, and a cam lever 29 actuated by a third cam gear 38 are respectively
20 provided on the main chassis 100.

A gear 41 is engaged with the capstan motor 40 and an idler operating pulley 43 is connected to the gear 41 via a belt 42. A stopper 54 having a V-shaped groove is provided at the left and right upper guide rails 51 and 52 to stop the pole bases 24 and 24a and a branch slot 56 is formed at the one upper side of the loading slot 55 of the left upper guide rail 51.

In order to transfer the driving force of the loading motor, the power transferring device has a driving gear 31, a first gear 32, a first cam gear 33, a second gear 34, a second cam gear 35, a third gear 36, a fourth gear 37 and a third cam gear 38 which are engaged in sequence with each other.

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The first cam gear 33 is provided with a cam slot 33a thereon which is guidingly fitted with a guide pin 39a of the cam lever 39, hingably fixed at a predetermined position on the bottom of the main chassis 100. The second cam gear 35 is provided with mode switches for controlling mode signals, so that the deck may be successively operated for each mode.

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The second cam gear 35 is provided with a first cam slot 35a and a second cam slot 35b. The plate slider 27 is lifted up and lowered by the first cam slot 35a and the sub-chassis actuating cam lever 28 is guided
5 along the second cam slot 35b.

The third cam gear 38 is provided with a third cam slot 38a thereon. A downwardly projected guiding pin 29a of the cam lever 29 is guidably inserted into the third
10 cam slot 38a. The cam lever 29 is provided with a guiding pin 29b and a long slot 29c and is pivotably fixed at a predetermined position on the main chassis 100 to be pivoted and guided by a hinge part 29d.

15 The capstan motor 40 is provided with a capstan base 25 thereon, having an inclined face 44 which guides a review arm 111, as will be described below.

Referring to Figure 3, a pair of lower guide rails 57
20 each having a loading slot 55 are respectively contacted with the upper left and right guide rails 51 and 52 and a pair of loading arms hingably fixed to the bottom of the sub-chassis 200. A pair of loading arm

assemblies 60 and 60a, which are guided along the loading slot 55 of the upper and lower guide rails 50 and 57, are connected to each pole bases 24 and 24a.

5 A supply reel 110 and a take-up reel 120 are mounted on either side of the sub-chassis 200. A braking device is provided at each reel 110 and 120 to brake the reels 110 and 120.

10 The braking device for the supply reel 110 includes a lever brake 71 which is driven by contact with a protrusion 35c of the cam gear 35 of the main chassis, and an arm brake 72 which brakes or releases the supply reel 110 according to the operation of the lever brake
15 71.

The lever brake 71 is hingably fixed to the upper face of the sub-chassis 200 and is provided at one end thereof with a downwardly bent contact part 73 which
20 may be contacted by the protrusion 35c of the second cam gear 35. The other end of the lever brake 71 pushes against a protrusion 75 of the arm brake 72 by virtue of a resilient member 74.

The arm brake 72 is hingably fixed to one side of the lever brake 71. The arm brake 72 is provided with a braking portion 76 for contactably braking the supply reel 120, and a protrusion 75 against which the rear portion of the lever brake 71 is pressed. An elastic member 77 is provided at the hinged portion of the arm brake 72.

The braking device for the take-up reel 120 includes an arm brake 81, which is rotated by contact with a cam surface 29e of the cam lever 29, and an arm clutch 82 which brakes or releases the take-up reel 120 according to the operation of the arm brake 81.

The arm brake 81, which is provided with a resilient member 83 and has a protrusion 84 at the bottom thereof, is hingably fixed to the sub-chassis 200. The protrusion 84 is contacted by the cam surface 29e of the cam lever 29.

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The arm clutch 82 includes a lever 85 having a circular arc face which is contacted to the braking face of the take-up reel 120, and an arm bracket 87 having a

braking portion 86 which is engaged with a lower geared part of the take-up reel 120. The arm bracket 87 and the lever 85 may be biased and spaced from each other by a resilient member 88 in order to prevent the take-up reel 120 from being rotated reversely.

An idler 89 is disposed between the supply reel 110 and the take-up reel 120 to selectively transmit the driving force to the reels 110 and 120.

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A slider 91 is movably provided at a predetermined position on the sub-chassis 200 to actuate a guide lever 96. A guide pin 97 of the lever 96 is guided along a cam slot 92 of the slider 91. The guide lever 96, which is provided at one end thereof with the lever guide roller 12, and the tension arm 26, which is provided at one end thereof with the tension pole 26, are mounted on a common shaft. The tension arm 26 is connected to an elastic member 26a and is also connected to a tension band 98 which is wound around the supply reel 110.

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A pinch roller lever 101 is provided with a guide pin 102 which is guided along the guide part 29b of the cam lever 29 on the main chassis 100. A pinch arm 106 is provided with a rotatable pinch roller 105 and a
5 contact part 108 which is contacted to a review arm 111. The pinch roller lever 101 is provided at one end with an elastic member 103 and is connected to the pinch arm 106 by an elastic member 107. The review arm 111 is elastically mounted by an elastic member 114 on
10 the sub-chassis 200 and includes a review arm pole 21, a contact protrusion 112 at the bottom thereof, and a contact part 113.

The operation of the present invention will now be
15 described for each position with reference to Figure 4.

First, an ejecting position EJP is assumed to move backward the sub-chassis 200 on the main chassis 100, so that the housing is opened to eject a tape.

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The unloading stop position ULP is a condition just prior to loading the tape, in which the housing is

locked after insertion of the cassette therein and the loading motor is slightly rotated.

5 The end sensor position ESP, which exists instantaneously, is a position for the tape to be wound toward the take-up reel for tape-loading, in which the guide lever 96, the pinch roller 105 and the review arm 111 start moving together with the sub-chassis 200.

10 In this end sensor position, the idler 89 is selectively positioned in accordance with the position of the end of the tape. The position of the idler 89 may be changed as desired by controlling the rotational direction of the capstan motor 40, that is, as shown in
15 Figures 2 and 6A, the gear 41, engaged with the capstan motor 40, can be rotated, the rotational power of which is transmitted to the idler 89 through the belt 42, so that the idler 89 may be positioned at the supply reel 110 or the take-up reel 120.

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The guide lever 96, the pinch roller 105 and the review arm 111 are moved along with the movement of the

sub-chassis 200. First, the movement of the sub-chassis 200 is as follows.

As shown in Figures 2 and 6B, when the loading motor 30
5 is actuated, reduced rotating power thereof is sequentially transmitted to driving gear 31 --> the first gear 32 --> the first cam gear 33 --> the second gear 34 --> the second cam gear 35 --> the third gear 36 --> the fourth gear 37 --> the third cam gear 38, to
10 thereby rotate them.

One end of the sub-chassis 200 is hingably fixed to the main chassis 100 in order to be movable according to the rotation of the cam gear 35, and the cam lever 28,
15 for guiding the sub-chassis transmitting guiding part 121 to the guide slot 122, is disposed at the protrusion 28a of the other end of the sub-chassis 200. Accordingly, the protrusion 28a of the cam lever 28 is rotated with a predetermined angle centering around the
20 hinge part, so that the sub-chassis 200, connected to the protrusion 28a, is automatically moved.

As shown in Figure 6C, the guide lever 96 is disposed at the upper face of the sub-chassis 200, and a guide pin 97 of the guide lever 96 is inserted into the cam slot 92 of the slider 91, so that the guide lever 96 is opened outward about the hinge part.

The pinch roller 105 is operated in a manner that, as shown in Figure 6C, the guide pin 102 of the pinch roller lever 101 disposed on the sub-chassis 200 is guided to the guiding part 29b of the cam slot 29 disposed on the main deck 200. The pinch roller lever 101 is rotated upward.

A pinch arm 106 disposed on the same hinge part as the pinch roller lever 101 is rotated upward according to the rotation of pinch roller 101, and the pinch roller 105, disposed at the pinch arm 106, is contacted with the capstan shaft 20 according to the subsequent movement of the sub-chassis 200.

A review arm 111 is operated in a manner that, as shown in Figure 6C, when the pinch arm 106 is rotated, the contacting part 108 of the pinch arm 106 pushes against

the contacting part 113 of the review arm 111, so that the review arm 111 is rotated about the hinge part. The review arm 111, hingably disposed on the sub-chassis 200, is guided to the inclined face 44 of the capstan base 25
5 of the capstan motor 40.

A sub-loading position SLP is a position in which the sub-chassis is corresponding to the main chassis 100 as the sub-chassis is being moved, and the pole bases 24 and
10 24a start loading, and a second sub-loading positioning is carried out in which the sub-chassis 200 completes moving to correspond to the main chassis 100 and the pole bases 24 and 24a are firstly loaded.

15 The loading of the pole bases will now be explained with reference to Figure 6D.

The power of the loading motor 30 is sequentially transmitted to driving gear 31 --> first gear 32 -->
20 first cam gear 33 --> second gear 34 --> second cam gear 35, according to which the sliding part 61b of both loading arms 61 comes near the end part of sub-chassis 200 by means of the cam lever 28 guided by

the second cam slot 35b of the second cam gear 35 and slides by means of a pair of pins 125 of levers 124 mounted on the upper part on both sides of plate slider 27, so that both loading arms 61, provided with a central hinge part 51a, which is hingably fixed to a hinge part of the lower side of the sub-chassis 200, are respectively inwardly rotated. Accordingly, pole bases 24 and 24a linked to the front part of both loading arms 61 are firstly loaded according to the rotation of both loading arms 61.

The playback position PBP is assumed for reproduction of the picture by loading the tape. It will be explained from the start of loading of the pole bases 24 and 24a in the condition that the sub-chassis 200 and the main chassis 100 are connected and the upper and the lower guide rails 50 and 57 are combined to each other and the loading slot 55 connected thereto as described above in respect of the sub-loading position.

The pole bases 24 and 24a are loaded according to the movement of the plate slider 27 by means of the second cam gear 35, according to which they are moved to the loading slot 55 of the right and left upper guide rails 51 and 52.

In this state, a branch lower guide part of the pole base 24 is inserted into the branch slot 56 while being lifted from the loading slot 55 and the pole base 24 is stopped after being rotated by a predetermined angle anti-clockwise.

Since the pole base 24 is rotated anti-clockwise, the tape 22 guided to the second inclined pole 16 on the pole base 24 is stably contacted with the periphery of the drum 10. The movement of the pole bases 24 and 24a is stopped by the stoppers 54, provided with V-grooves 53, of the right and left upper guide rail 51 and 52, and in this condition the tape is reproduced.

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Referring to Figures 1 and 5, since the tension arm 26, having a tension pole 11, is placed on the outside of the tape by being rotated around the hinge part through

the unloading stop position ULS and end sensor position ESP, the tension pole 11 of the tension arm 26 presses against the outside of the tape, resulting in tension being applied to the tape by using the contacting force of the tension band 98.

In this playback position PBP, the tape 22 wound on the supply reel 110 is to be wound on the take-up reel 120 in order to record or reproduce a signal on the tape. For this purpose, the tape 22 is wound between the pinch roller 105 and the capstan shaft 20 by the revolving force of the capstan motor 40.

The operation of pressing the pinch roller 105 against the capstan shaft 20 will be explained with reference to Figure 6C.

The third cam gear 38 is provided with a cam lever 29 for guiding the guiding pin 29a along the cam slot 38a. The cam lever 29, having a guiding part 29b at one side thereof, may be rotated around the hinge part 29d with a predetermined angle according to the rotation of the third cam gear 38.

The cam lever 29 is rotated around the hinge part 29d in the condition that the guide pin 102 is guided at the guiding part 29b of the cam lever 29. The pinch arm 106 has the pinch roller 105 and a pinch roller lever 101 downwardly disposed at the guide pin 102, so that the pinch roller 105 being guided toward the capstan shaft 20 is pressed down to the capstan shaft 20 by the rotation of the cam lever 29.

The stand-by position SBP is carried out to stop reproduction of the picture in the playback position and perform a desired position. In this position, both reels 110 and 120 are braked by the arm brake 72 and the arm clutch 82, the pinch roller 105 is separated from the capstan shaft 20 to stop running of the tape, and the tension pole 11 becomes loose to protect the tape in the loading condition.

Each part operated in the stand-by position will now be explained.

Referring to Figure 6E, the arm brake 72 is actuated according to the rotation of the second cam gear 35, rotated by the loading motor 30, and brakes the supply reel 110.

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That is, a protrusion 35c is formed at a predetermined position on the second cam gear 35. The lever 71, having a contacting part 73 contacted with the protrusion 35c, is disposed at a predetermined position on the supply reel 110. The arm brake 72 for controlling the supply reel 110 by means of the lever brake 71 is disposed at one side of the lever brake.

Accordingly, when the protrusion 35c of the second cam gear 35 is contacted with the contacting part 73 according to the rotation of the second cam gear 35, the lever brake 71 is rotated around the hinge part by a predetermined angle and releases the protrusion 75 of the arm brake 72.

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Then, the braking part of the arm brake 72 brakes the supply reel 110 by using the elastic force of the elastic member 77.

Referring to Figures 3 and 6E, the arm clutch 82, braking the take-up reel 120, actuates the arm brake 81 by means of the third cam gear 38 rotated by the loading motor 30, according to which the arm clutch 82 is actuated and the braking part 86 of the arm clutch brakes the take-up reel 120.

That is, referring to Figures 3 and 6E, if the cam lever 29, disposed on the third cam gear, is rotated by a predetermined angle around the hinge part 29d within the long slot 29c, according to the rotation of the third cam gear 39, the downward protrusion 84 is guided to the cam surface 29e of the cam lever 29 and the arm brake 81 is rotated around the hinge part.

The arm brake 81 being rotated pushes the arm clutch 83, disposed at one side of the arm brake 81, whereby the braking part 86 of the arm clutch 82 brakes the take-up reel 120.

The releasing operation of the pinch roller 105 for stop running of the tape will be explained below with reference to Figures 1, 3 and 6C.

The cam lever 29 rotated by a predetermined angle, according to the rotation of the third cam gear 38, slightly regresses in the direction opposite the rotation due to the shape of the cam slot 38a of the third gear 36. According to the regressive rotation of the cam lever 29, the guide pin 102 of the pinch roller lever 101, disposed at the guiding part 29b, regresses to the pinch roller lever 101 by means of the elastic member 103 as much as the regression of the cam lever 29, resulting in that the pinch roller 105 is separated from the capstan shaft 20.

The releasing operation of the tension pole 11 for protecting the tape after the loading condition will now be explained.

Referring to Figures 2 and 6F, a guide pin 39a of the cam lever 39 is inserted into the cam slot 33a of the first cam gear 33 rotated by the rotation of the loading motor 30, so that the cam lever 39 is moved slightly outside around the hinge part to form the stand-by position in accordance with the shape of the cam slot 39a.

According to the rotation of the cam lever 39, the cam lever 39 pushes the downwardly bending part 26b of the tension arm 26, hingably disposed on the sub-chassis 200, toward the outside, so that the tension arm 26 is moved by the pretermined angle around the hinge part toward the outside, according to which the tension pole 11 is digressed to the outside and the tension pole 11, supporting the periphery of the tape 22, is released.

As stated above, in the camcorder deck driving device, the drum is disposed slanting forward on the main deck, and the tension pole is disposed to push the tape from the outside thereof to the inside. Moreover, the structure of each element is simplified as well as the braking part for braking both reels and the pinch roller driving part.

Therefore, the present invention has an advantage in that the size of the deck can be considerably minimized. Moreover, a simplified and generalized drum can be used, the handling and operation are simple and the production cost can be reduced.

The invention is not limited to the embodiment described hereinbefore. Various modifications of disclosed embodiment as well as other embodiments of the claimed invention will readily be apparent to persons skilled in the art upon reference to the above description.

Claims

1. A video tape deck comprising a main chassis, a sub-chassis movable relative to the main chassis between a tape loading position and a tape playing position, a head drum mounted on the main chassis, first and second guide means provided on the main chassis on respective sides of the head drum, third and fourth guide means provided on the sub-chassis and arranged to create first and second combined guide means with the first and second guide means respectively when the sub-chassis is moved into the tape playing position, and first and second pole bases mounted on the sub-chassis for loading a tape onto the head drum by being guided along respective combined guide means, wherein the first guide means is provided with a branching portion for receiving a pole base so as to allow rotation thereof during tape loading, such that a tape-guiding pole thereon is brought towards the head drum.

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2. A video tape deck according to claim 1, wherein the head drum is 40mm in diameter and its axis is inclined at 80° to the main chassis.

25 3. A video tape deck according to claim 1 or 2, wherein the first and second guide means include stoppers, for stopping the pole bases, at their ends remote from the third and fourth guide means.



4. A video tape deck according to claim 1, 2 or 3, including tape guide means comprising in sequence: a tension pole, a lever guide roller, a first inclined pole, a first inclined guide roller, a second inclined guide roller, said tape-guiding pole which is inclined, the head drum, a second inclined pole, a third inclined guide roller, a third inclined pole, a capstan shaft and a review arm pole.
- 10 5. A video tape deck according to claim 4, wherein the tension pole is provided at an end of a tension arm to bear against the outer surface of a tape, the tension arm being provided on the sub-chassis, the lever guide roller is provided at an end of a guide lever which is coaxially
15 mounted with the tension arm, the first inclined pole and the first inclined guide roller are provided on a base which is fixedly mounted on the main chassis, the second inclined guide roller is fixedly mounted on said first pole base, the second inclined pole and the third
20 inclined guide roller are fixedly mounted on the second pole base, and the third inclined pole is fixedly mounted to a capstan base.
5. A video tape deck substantially as hereinbefore
25 described with reference to the accompanying drawings.



lever guide roller is provided at a front end of a guide lever which is coaxially mount to a short of said tension arm, said first inclined pole and said first inclined guide lever roller are provided on a base which is fixedly mounted on the main chassis, said second inclined guide roller and said second inclined pole are fixedly provided on the left pole base, said third inclined pole and said inclined guide roller are fixedly provided on the right pole base, and said fourth inclined pole is fixedly provided on a capstan base.

7. A method for controlling a deck of a camcorder comprising:
- an ejecting step for moving backward a sub-chassis on a main chassis to open a housing and for ejecting a tape;
 - an unloading stop step for inserting a tape into said housing and for locking said housing to said sub-chassis;
 - a sensing step for sensing a tape position to load the tape and for moving a pinch roller and a review arm together with said sub-chassis;
 - a sub-loading step for loading pole bases;



a playing back step for operating the pole bases and pressing the pinch roller against a capstan shaft to play back records on the tape; and
5 a stand-by step for stopping a take-up reel and a supply reel and for moving the pinch roller apart the capstan shaft to stop said playing back step and select a desired step.

8. A method as claimed in claim 7, wherein said
10 sub-loading step comprises a first sub-loading sub-step for starting to load the pole bases in accordance with movement of said sub-chassis on said main chassis and for loading primarily the pole bases by fitting together said main chassis and said sub-chassis, and a
15 second sub-loading sub-step for loading completely the pole bases by moving a plate slide.

9. A video tape deck comprising:
a main chassis;
20 a sub-chassis movable relative to the main chassis between a tape loading position and a tape playing position;
a head drum mounted on the main chassis;



first guide means provided on the main chassis on either side of the head drum;

second guide means provided on the sub-chassis and arranged to create combined guide means with respective first guide means when the sub-chassis is moved into the tape playing position; and

pole bases mounted on the sub-chassis for loading a tape onto the head drum by being guided along respective combined guide means.

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10. A video tape deck substantially as hereinbefore described with reference to the accompanying drawings.

11. A method of operating a video tape deck substantially as hereinbefore described with reference to the accompanying drawings.

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