

MAGNETIC TAPE RUNNING DIRECTION
CHANGEOVER MECHANISM

BACKGROUND OF THE INVENTION

1) Field of the Invention

This invention relates to a magnetic tape running direction changeover mechanism.

5 2) Description of the Prior Art

In e.g. a tape recorder permitting changeover of the running direction of a magnetic tape in either one of the two directions, it is desirable that the magnetic head is brought into contact at an appropriate
10 position with a magnetic tape (hereinafter called "tape" for the brevity of simplicity) no matter in which direction the tape is caused to run.

As a mechanism enabling such positioning (azimuth alignment) one example is disclosed in Japanese Utility
15 Model No. 17624/1983.

The mechanism disclosed in the above-mentioned publication can however effect an azimuth alignment when a tape is caused to run in only one direction. It is difficult to incorporate it in a tape recorder
20 which allows a change in the running direction of a tape in either one of two directions.

SUMMARY OF THE INVENTION

An object of this invention is therefore to provide a tape running direction changeover mechanism which can automatically perform, without making the structure complex, an azimuth alignment to bring the magnetic head into contact with an appropriate position of a tape no matter in which direction the tape is caused to run.

According to the present invention there is provided a tape running direction changeover mechanism comprising paired reel shafts, capstans and pinch rollers respectively arranged symmetrically at both sides of a magnetic head, a tape running direction changeover member which is reciprocable, to and fro, to change over two torque transmission paths, which extend from a motor to the respective reel shafts respectively, from one to the other, and vice versa, a pinch roller changeover member for bringing the respective pinch rollers into and out of contact with their associated capstans responsive to each changeover of the tape running direction changeover member, a pair of azimuth alignment screw support members provided one on each side of the magnetic head and mechanically interlinked for movement with the pinch roller changeover member, and front and rear pairs of azimuth alignment screws mounted, one

screw of each pair, in each of said support members, the arrangement being such that in accordance with the movements of the pair of azimuth alignment screw support members, one of each pair of alignment screws are brought into contact respectively with opposite ends of a magnetic head support strip which carries the magnetic head between its ends, thereby to control the vertical position and inclination of the magnetic head.

In spite of the above-described simple structure, the tape running direction changeover mechanism of this invention can automatically bring the magnetic head into contact with an appropriate position of the tape no matter in which direction the tape is caused to run.

A specific embodiment of the present invention will now be described in detail by way of example with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view illustrating a part of a tape running direction changeover mechanism according to this invention, in which a tape is running in the leftward direction as viewed in the Figure;

FIG. 2 is a plan view similar to Figure 1 but with the tape running in the rightward direction as viewed in the Figure.

FIG. 3 is an exploded perspective view of a magnetic head and its peripheral parts in the mechanism;

FIG. 4 is a plan view showing the relationship between a pinch roller changeover member and an azimuth alignment screw support member in the mechanism;

FIGS. 5(a) and 5(b) are plan views each of which shows the relationship between a magnetic head support strip and azimuth alignment screws in the mechanism; and

FIG. 6 is a side view showing the relationship between the magnetic head support strip and the azimuth alignment screws in the mechanism.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

With reference to the drawings, the numeral 1 indicates a tape running direction changeover member. This tape running direction changeover member 1 is longitudinally reciprocal and is controlled to move, for example, from the right to the left or from the left to the right in Figure 1 by a control system (not shown) when a tape has been fully taken up. Of course, it may be controlled by a manual operation in some instances.

When the tape running direction changeover member 1 assumes a right-hand position as depicted in Figure 1, the torque of a motor (not shown) is transmitted to a left-hand reel shaft 7L via gears 2, 3R, 3L, 4L, 5L, 6L.

When the tape running direction changeover member 1 has moved leftwards as depicted in Figure 2, the torque of the motor is transmitted to a right-hand reel shaft 7R via the gear 2,3R and gears 4R,5R,6R.

5 Incidentally, the gears 5L,5R are supported respectively on members 8L,8R which are turnable about the reel shafts 7L,7R respectively. A tension spring 9 extends between the members 8L,8R. Owing to the pulling force of the spring 9, the gears 5L,5R are biased in
10 such directions that they are brought into meshing engagement with their corresponding gears 4L,4R. On the other hand, the tape running direction changeover member 1 and the members 8L,8R are arranged in such relationship that lugs 10L,10R are selectively brought into engagement
15 with projections 11L,11R respectively. Namely when the changeover member 1 assumes the right-hand position, the lug 10R is brought into contact with the projection 11R so that the gear 5R is separated from the gear 4R to transmit the torque of the above-described motor to
20 the left-hand reel shaft 7L only. When the changeover member 1 assumes the left-hand position on the other hand, the lug 10L is brought into contact with the projection 11L so that the gear 5L is separated from the gear 4L to transmit the torque of the above-described
25 motor to the right-hand reel shaft 7R only.

The tape running direction changeover member 1 defines an opening 12 having a portion in which a pin 14 of a pinch roller changeover member 13 is slidingly engaged. The changeover member 13 is pivotably supported by a shaft 15. The changeover member 13 is interlocked by the pin 14 with the changeover member 1, so that the changeover member 13 is turned about the shaft 15, clockwise for rightward movement of the member 1 and anti-clockwise for leftward movement of the member 1. A horizontally-extending long rod-like spring 16 is supported on the changeover member 13. Both horizontal ends of the rod-like spring 16 engage pinch roller support members 18L, 18R which support pinch rollers 17L, 17R respectively. The left-hand pinch roller 17L is therefore maintained in contact under pressure with a left-hand capstan 19L while the changeover member 1 assumes its right-hand position as shown in Figure 1. When the changeover member 1 is at the left-hand position as depicted in Figure 2, the right-hand pinch roller 17R is maintained in contact under pressure with a right-hand capstan 19R. Needless to say, the force for pressing each of the pinch rollers against its corresponding capstan is given by the rod-like spring 16.

On both sides of a magnetic head 20, there are arranged azimuth alignment screw support members 21L, 21R.

The support members 21L,21R are turnable about their corresponding pivots 22L,22R. Here, both pivots 22L,22R are provided upright on a plate-like member 23 (see Figure 3) which supports the magnetic head 20 thereon for back and forth movement.

The left-hand and right-hand support members 21L,21R are provided with projections 24L,24R respectively as shown in Figure 4. These projections 24L,24R are maintained in engagement between corresponding bifurcated bent portions 25L,25R formed at left and right hand end portions respectively of the pinch roller changeover member 13. In the respective azimuth alignment screw support members 21L,21R, azimuth alignment screws 26La, 26Lb; 26Ra,26Rb are received in front-and-rear pairs 26La,26Ra and 26Lb and 26Rb respectively.

On the other hand, a mounting base 27 made of a synthetic resin is provided on the upper surface of the plate-like member 23. Guide projections 28L,28R are provided upright on left and right end portions of the upper surface of the mounting base 27. Above the upper surface of the mounting base 27, there are successively arranged a downwardly-arched leaf spring 29 and a magnetic head support strip 30. The magnetic head 20 is secured centrally on the support strip 30. The leaf spring 29 and support strip 30 define guide

holes 32L,32R; 33L,33R through left and right end portions thereof. The guide holes 32L,32R; 33L,33R are fitted on their corresponding guide projections 28L,28R, whereby the leaf spring 29 and support strip 30 are movable up and down. Further, transverse, upwardly-arched portions 34L,34R are formed at both left and right end portions of the support strip 30 respectively.

Figures 5(a) and 5(b) illustrate the relationship between the azimuth alignment screws 26La,26Lb; 26Ra,26Rb and the upwardly-arched portions 34L,34R.

In the state shown in Figure 1 in which the pinch roller changeover member 13 has turned clockwise, the left-hand member 21L has been turned frontward, towards the member 1, whereas the right-hand member 21R has been turned rearward away from the member 1. This is depicted in Figure 5(a). Hence, as illustrated in Figure 6, the rear azimuth alignment screw 26Lb is in contact at the bottom thereof with the arched portion 34L on the left and the front azimuth alignment screw 26Ra is in contact at the bottom thereof with the arched portion 34R on the right. The vertical position and inclination of the magnetic head 20 is controlled by these two screws 26Lb,26Ra. In the state shown in Figure 2 in which the pinch roller changeover member 13 has turned counterclockwise, the left-hand member 21L has been turned rearward

whereas the right-hand member 21R has been turned frontward as depicted in Figure 5(b). As a result, the front azimuth alignment screw 26La is in contact at the bottom thereof with the arched portion 34L on the left and the rear azimuth alignment screw 26Rb is in contact at the bottom thereof with the arched portion 34R on the right. The vertical position and inclination of the magnetic head 20 is then controlled by these two screws 26La, 26Rb.

Owing to the adoption of the above-described structure, the vertical position and inclination of the magnetic head 20 is controlled by the azimuth alignment screws 26Lb, 26Ra when a tape is caused to run in the leftward direction. When the tape is caused to run in the rightward direction on the other hand, the vertical position and inclination of the magnetic head 20 is controlled by the azimuth alignment screws 26La, 26Rb. It is hence possible to perform an azimuth alignment so as to bring the magnetic head 20 into contact with an appropriate position of a tape by turning and adjusting these four screws independently in advance, no matter in which direction the tape is caused to run.



CLAIMS:

1. A tape running direction changeover mechanism comprising

paired reel shafts, capstans and pinch rollers respectively arranged symmetrically at both sides of a magnetic head,

a tape running direction changeover member which is reciprocable, to and fro, to change over two torque transmission paths, which extend from a motor to the respective reel shafts respectively, from one to the other, and vice versa,

a pinch roller changeover member for bringing the respective pinch rollers into and out of contact with their associated capstans responsive to each changeover of the tape running direction changeover member,

a pair of azimuth alignment screw support members provided one on each side of the magnetic head and mechanically interlinked for movement with the pinch roller changeover member,

and front and rear pairs of azimuth alignment screws mounted, one screw of each pair, in each of said support members, the arrangement being such that in accordance with the movements of the pair of azimuth alignment screw support members, one of each pair of alignment screws are brought into contact respectively with opposite ends



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of a magnetic head support strip which carries the magnetic head between its ends, thereby to control the vertical position and inclination of the magnetic head.

2. A tape running direction changeover mechanism
- 5 substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.
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