

Magnetic Tape

Magnetic tape devices for video recording require high relative speeds between magnetic tape and write-read head.

These are usually obtained by the known "Helical-Scan" system. The tape is pulled out of the cassette and wound around a rotating head drum in a helical loop.

In order to scan the tracks, which have a width of only a few μ , a precise tape guidance is necessary at the head drum as well as in the tape segments running in and running off.

In the incoming tape segment usually two vertical position guides are fitted, one of which is in a fixed position between tape tension sensor and erasing head, and the other as a guide flange at the deflecting roller of the threader. Generally, both guides are vertically adjusted by means of screw spindles.

1. In order to obtain a good tape-to-head contact and stable tape run at the run-in of the drum without unnecessarily increasing the overall tape tension in a magnetic tape recorder according to the preamble of the independent claims, the tensioning of the lower edge of the tape is increased (DE-A-3040016 and EP-A-0083932). This leads to bow-shaped curving of the incoming tape segment. The curvature radius is - apart from the tape tension - also dependent upon the type of tape and, in case of insufficient compensation through the first vertical position guide, leads to an unwanted angular running-in into the deflecting roller, whereby the edge of the tape, by screw motion, is pressed onto the guide flange with excessively high force and overstretched. With fixedly-adjusted flanges an optimal tape guidance can be obtained only for one type of tape.

It is the object of the invention to improve the tape guidance in the area of the running-in of the tape before the head drum,

From document EP-A-0186591 there is known a tape tension adjustment arrangement with a pivotally-mounted tape-tension sensing lever, upon which is arranged a tape guiding roller on a perpendicular axis. This tape guiding roller, having for tape guidance an upper and a lower flange, is positioned vertically by means of a pressure spring bearing on the tape-tension sensing lever.

Furthermore from document JP-A-61199262 there is known a tape guiding roller which has an upper and a lower

flange and is arranged at the incoming tape side of the rotating head drum of a video-recorder. In the lower flange there is provided a coaxially-arranged tape support device, which can be actuated by a pressure spring such that the upper edge of the tape is pressed against the upper flange in order to achieve a stable and non-oscillatory tape run even at the start of the recording or reproduction operation.

The object set out above is solved according to the invention by the features set out in claim 1, or claim 2. An advantageous further development of the invention is characterised in the dependent claim.

In principle, a resilient guide is integrated into the tape tension sensing pin; in this way, costs can be saved by omitting the fixed guide. As the tape tension sensor must be an easily movable element, a fixed vertical guide cannot be sufficiently precisely positioned at this pin. If, then a sprung guide flange is fitted there, the resilience of which compensates the flexing perpendicular to the direction of the tape run, the optimal running-in angle into the deflecting roller can be obtained better than with a fixed guide, because the tape tension is regulated.

An example of the invention will be explained below in more detail with reference to the Figures:

Fig.1 shows a known tape guidance means;

Fig.2 shows possible tape guidance means in the area of the running-in to the head drum;

Fig.3 shows a tape guidance means according to the invention;

Fig.4 shows a possible construction for the sprung tape tension sensing pin.

Figure 1 shows a known tape guidance means. The magnetic tape 1 is pulled out of a cassette 5 and, via deflecting pin 4, tape tension sensor 3, vertical guide 2, audio head 7 and deflecting roller 8, laid against the head drum 6.

Figure 2 shows possible tape guidances in the area of the running-in of the tape towards the head drum.

Figure 2a shows an ideal tape guidance in which the guide 2, which is adjustable in its vertical position, is provided with a flange upon which the lower edge of the magnetic tape 1 rests. The auxiliary flange 9 mounted on the deflecting roller 8 is co-planar with the

flange of guide 2 in such a way that angular running-in of the magnetic tape into the deflecting roller 8 is avoided.

Figure 2b shows a guidance 2 without flange. Here a stress is put on the tape edge in the area of auxiliary flange 9, because the magnetic tape 1 - dependent on its stiffness - is "bent" more or less.

Figure 2c shows a fixedly-adjusted guide 2 by means of which an equal guide height is set for a stiff tape 10 as well as for a yielding tape 11. From the different types of tape differing running-in angles result in the region of the auxiliary flange 9 of the deflecting roller 8.

Figure 2d shows a sprung guide 2, by which the changing degrees of stiffness in different types of tape are compensated by the spring 12, so that always the same running-in angle results due to the vertical positioning in the deflecting roller 8 adjusted by flange 13 according to the stiffness of the tape.

Figure 3 shows a tape guidance according to the invention. The tape 1 is pulled out of a cassette 5 and, via tape tension sensor 3 with the sprung tape tension sensing pin 2, audio head 7 and deflecting roller 8, applied to the head drum 6. A further guide between the sprung tape tension sensing pin 2 and the deflecting roller 8 is not provided.

Figure 4 shows a possible construction for the sprung tape tension sensing pin. The sensing pin 2 is fixedly arranged on the tape tension sensing lever 3. A flange 13 which is movable on the sensing pin 2 and on which rests the lower edge of the magnetic tape 1 is set in a vertically adjustable manner by a pressure spring 12. The spring 12 rests on the tape tension sensing lever.

In an arrangement not shown the flange 13 can be fixedly connected to the sensing pin 2. In this arrangement the whole sensing pin 2 must be movable and directed against the tape guide lever 3 by the spring pressure of the pressure spring 12.

Claims

1. A magnetic tape recorder, which operates according to the "Helical-Scan" system, and which in the region of the incoming tape run before the head drum (6) has a deflecting roller (8) and a tape-tension sensing pin (2) fixed on a tape-tension sensing lever (3), characterised in that on the tape tension sensing pin (2) for guidance of the lower edge of the magnetic tape there is provided a displaceable flange (13), the vertical position of which is determined by a pressure spring (12) resting on the tape tension sensing lever (3), the resilience of the spring being designed so that the running-in angle of the magnetic tape at the deflecting roller (8) is consistent with different stiffnesses of the magnetic tapes used.
2. A magnetic tape recorder, which operates according to the "Helical-Scan" system, and which in the region of the incoming tape run before the head drum (6) has a deflecting roller (8) and a tape-tension sensing pin (2) fixed on a tape-tension sensing lever (3), characterised in that the tape tension sensing pin (2) for guidance of the lower edge of the magnetic tape has a fixedly mounted flange, and that the tape sensing pin (2) is vertically adjustable by means of a pressure spring (12) resting against the tape tension sensing lever (3), the resilience of the spring being designed so that the running-in angle of the magnetic tape at the deflecting roller (8) is consistent with different stiffnesses of the magnetic tapes used.
3. A magnetic tape recorder according to any one of claims 1 or 2, characterised in that no further tape guide is provided between tape sensing pin (2) and deflecting roller (8).

