SPECIFICATION

Magnetic-tape recording and/or playback apparatus and a magnetic-tape cassette for use on the apparatus.

The invention relates to a combination of a magnetic-tape recording and/or playback apparatus and a magnetic-tape cassette for use on the apparatus, the cassette comprising a housing which accomodates two rotatable winding hubs, a length of magnetic tape connected at one end to one winding hub and at the other end to the other winding hub so that by rotation of the hubs the tape is unwound from one hub and wound on the other hub and at least one tape-guide roller which is rotatable by the magnetic tape, for guiding the tape during its transport from one hub to the other, and the recording and/or playback apparatus comprising tape-drive means for the transport of the magnetic tape in the cassette from one hub to the other.

In such a combination it is known to provide means for measuring and indicating the length of magnetic tape transported between the hubs and comprising a radition source for the generation of a radiation beam, a radiation-sensitive electrical element located in the path of the radiation beam, and a pulse device for cooperation with the radiation beam, which pulse device is disposed in the path of the radiation beam between the radiation source and the radiation-sensitive element and is rotatable by the tape-drive means and is provided with means for varying during rotation of the pulse device the exposure of the radiation-sensitive element by the radiation beam alternately between a maximum and a minimum value so as to vary an electrical property of the radiation-sensitive element between a maximum and a minimum value.

United States Patent Specification 3,820,101 discloses a magnetic-tape recording and/or playback apparatus in which the tape-drive means for the transport of the magnetic tape in the cassette comprises two winding spindles which cooperate with the two winding hubs. One of these winding spindles drives a pulse device *via* a belt, which pulse device consists of a disc in which apertures are formed. A radiation source in the form of an incandescent lamp is arranged on one side of the disc and a radiation-sensitive element in the form of a phototransistor is arranged on the other side. During the rotation of the disc the phototransistor is periodically exposed to the light beam transmitted by the lamp. The variations in the voltage at the output of the phototransistor are counted with the aid of an electronic counting circuit. The number of pulses counted by the electronic circuit is a measure of the transported length of magnetic tape.

A disadvantage of this known system and of similar magnetic-tape transport systems is the fact that the relationship between the transported length of tape and the number of counted pulses is non-linear. This is because the diameter of the respective reel of tape changes during unwinding or winding, so that there is no constant relationship between the number of pulses per revolution of the pulse device and the length of magnetic tape which is transported per revolution of a winding hub.

According to the invention there is provided a combination of a magnetic-tape recording and/or playback apparatus and a magnetic-tape cassette for use on the apparatus, the cassette comprising a housing which accomodates two rotatable winding hubs, a length of magnetic tape connected at one end to one winding hub and at the other end to the other winding hub so that by rotation of the hubs the tape is unwound from one hub and wound on the other hub, and at least one tape-guide roller which is rotatable by the magnetic tape, for guiding the tape during its transport from one hub to the other, and the recording and/or playback apparatus comprising tape-drive means for the transport of the magnetic tape in the cassette from one hub to the other, wherein means are provided for measuring and indicating the length of magnetic tape transported between the hubs and comprising a radiation source for the generation of a radiation beam, a radiation-sensitive electrical element located in the path of the radiation beam, and a pulse device for coooperation with the radiation beam, which pulse device is disposed in the path of the radiation beam between the radiation source and the radiation-sensitive element and is operable by the tape, during transport thereof, to vary the exposure of the radiation-sensitive element by the radiation beam alternately between a maximum and a minimum value so as to vary an electrical property of the radiation-sensitive element between a maximum and a minimum value, the tape-guide roller, or one of the tape-guide rollers, in the cassette being constructed to serve as the pulse device, and the cassette housing being constructed to allow transmission of the radiation beam into the interior of the housing for cooperation with the tape-guide roller serving as the pulse device.

As a result of using a tape-guide roller, which is driven by the magnetic tape itself, as the pulse device, an excellent linearity between the measured number of variations in the electrical property of the radiation-sensitive element and the length of magnetic tape which has been transported can be achieved. Measuring the transported length of tape is effected directly at the location where the magnetic tape is transported without the intervention of further movement-imparting components.

In one embodiment of the invention the tape-guide roller serving as the pulse device has a bore extending through it at a distance from and parallel to its axis of rotation to permit periodic passage of said radiation beam through the roller during rotation thereof. In a further embodiment of the invention the tape-guide roller serving as the pulse device comprises at at least one end of the roller two portions with different radiation-reflecting properties for periodically reflecting the radiation beam during rotation of the roller.

In yet another embodiment the tape-guide roller which serves as the pulse device comprises a cylindrical surface having two portions with different radiation-reflecting properties for periodically re-

flecting said radiation beam during rotation of the roller.

The invention further provides a magnetic-tape cassette for the combination according to the invention, the cassette comprising a housing which accommodates two rotatable winding hubs, a length of magnetic tape connected at one end to one winding hub and at the other end to the other winding hub so that by rotation of the hubs the tape is unwound from one hub and wound on the other hub, and at least one tape-guide roller which is rotatable by the magnetic tape, for guiding the tape during its transport from one hub to the other, wherein the tape-guide roller, or one of the tape-guide rollers, is constructed to serve as the pulse device, and the cassette housing is constructed to allow transmission of the radiation beam into the interior of the cassette for cooperation with the tape-guide roller serving as the pulse device. An opening may be provided in the cassette housing for the transmission of the radiation beam into the housing. If this is undesirable, the cassette housing may be constructed with a transparent part to allow the transmission of the radiation beam.

Embodiments of the invention will now be described in more detail with reference to the accompanying drawings, in which:

Figure 1 is an exploded perspective view of a magnetic-tape cassette for use in a first embodiment of the invention,

Figure 2 is a perspective view of a magnetic-tape recording and/or playback apparatus according to this first embodiment of the invention,

Figure 3 is an exploded perspective view of a cassette holder of the apparatus shown in Figure 2,

Figure 4 illustrates schematically the tape-transports measuring and indicating means of the apparatus shown in Figure 2,

Figure 5 is a perspective view of a magnetic-tape recording and/or playback apparatus according to a second embodiment of the invention,

Figure 6 is a fragmentary perspective view of a detail of a magnetic-tape cassette for use on the apparatus shown in Figure 5,

Figure 7 is a sectional view on an enlarged scale of part of the tape-transport measuring and indicating means of the apparatus shown in Figure 5, and

Figure 8 illustrates schematically the tape-transport measuring and indicating means of the apparatus shown in Figure 5.

The magnetic-tape cassette 40 shown in Figure 1 is a double-sided cassette, that is to say, a cassette containing a tape on which two tracks can be recorded. It comprises a housing of rectangular shape consisting of complementary top and bottom parts 1 and 2 respectively which can be secured together with five screws 3. The housing accommodates two winding hubs 4 and 5. A magnetic tape 6 is connected at one end to the winding hub 4 and at the other end to the winding hub 5. The tape 6 is shown with the greater part of the tape wound in a reel 7 on the winding hub 4 and a smaller part wound in a reel 8 on the winding hub 5. By rotation of the winding hubs 4 and 5 the magnetic tape can be unwound from one winding hub and wound on the other winding hub. The bottom housing part 2 is provided with two pins 9 and 10 on which two tape guide rollers 11 and 12 are rotatably mounted. The axes of rotation of the tape guide rollers 11 and 12 are designated 13 and 14 respectively. The top housing part 1 has two openings 15 and the bottom part 2 has two openings 16. These openings are provided for the passage of the winding spindles which are provided on a magnetic-tape recording and/or playback apparatus for cooperation with the winding hubs 4 and 5. The housing has a front wall which is formed on the top housing part 1 and which has a number of openings 17, 18, 19, 20 and 21 for the passage of the means which are provided on a magnetic-tape recording and/or playback apparatus for cooperation with the magnetic tape, such as a magnetic recording and/or playback head, a tape pressure roller, an erase head, etc. The bottom housing part 2 is provided with an upright stationary tape guide 22 along which the magnetic tape 6 is guided on its way from the tape-guide roller 11 to the tape-guide roller 12 or vice versa. In the tape guide 22 are mounted a mu-metal screening bracket 23 and a phosphor-bronze spring 24 provided with a felt pressure pad 25 for shielding magnetic fields from a recording and/or playback head and pressing the magnetic tape against such a head respectively. Between the reels of tape 7 and 8 and each of the top and bottom housing parts a flat foil 26 and a corrugated foil 27 are interposed for resiliently exerting pressure on the axially guiding the reels of tape 7 and 8 in the correct manner.

The tape-guide rollers 11 are further constructed so that one or the other of them, depending on which half of the tape in the cassette is being scanned by the magnetic head at the time, can serve additionally as a pulse device. To this end the roller 11 has a bore 28 extending through at a distance from and parallel to its axis of rotation 13 to allow a radiation beam to pass periodically through the roller during its rotation. The top and bottom housing parts 1 and 2 have corresponding openings 29 and 30. These openings are in such positions relative to each other and at such a distance from the axis of rotation 13 of the tape-guide roller 11, that in a specific position of the roller (see Figure 1) a radiation beam which is incident on the lower side of the magnetic-tape cassette in the direction of the axis 31 can pass through the opening 29 and through the bore 28 and the opening 30 to the other side of the cassette. Similarly, the tape-guide roller 12 has an eccentric, axially extending bore 32, and the top and bottom housing parts 1 and 2 have corresponding openings 33 and 34, so that a radiation beam can also pass through the cassette along an axis 35. In the case of a single-side cassette, i.e., a cassette containing a tape on which only one track can be recorded, only one of the tape-guide rollers need be constructed to serve as a pulse device for cooperation with the radiation beam.

Figure 2 shows a magnetic-tape recording and playback apparatus 36, usually referred to as "a cassette recorder", of the front-loading or vertical

type. It comprises a casing 37 and a front panel 38 on which is provided a number of conventional control and indicating elements, which are shown in Figure 2 but not designated by reference numerals. In the front panel 38 a hinged cassette holder 39 is mounted. A cassette 40 of the construction shown in Figure 1 is shown inserted in the holder 39. In Figures 1, 2 and 4 corresponding parts of the cassette bear corresponding reference numerals. The cassette holder 39 can be moved through a 90° angle between the open or loading position shown in Figure 2 and a closed position in which is almost completely accommodated in a recess 41 in the front panel 38 of the recorder. This recess has a bottom 42 through which two locating pins 43 and 44 project, as well as a tape-drive capstan 45. The housing of the cassette 40 (see Figure 1) has openings 46 and 47 in its top part 1 and corresponding openings 48 and 49 in its bottom part 2 for the passage of the locating pins 43 and 44; it also has corresponding openings 50, 51 and 52, 53 in the top and bottom housing parts respectively for the passage of the capstan. Two winding spindles pass through the bottom 42 and are adapted to cooperate with the winding hubs of the cassette 40; these spindles are not visible in Figure 2. The winding spindles and the capstan 45 are driven by one or more electric motors (not shown) in the interior of the cassette recorder 36 and form parts of the tape-drive means for the transport of the magnetic tape in the cassette 40 from one winding hub to the other. These tape-drive means are not shown but may be of any type such as is used in commercially available cassette recorders. When the cassette holder 39 has been moved to the closed position a magnetic head 54 and a tape pressure roller 55 are moved into the cassette 40 through the openings provided in the front wall of the cassette housing. The pressure roller 55 cooperates with the magnetic tape in known manner and presses it against the cylindrical surface of the capstan 45.

As shown in Figure 3, the cassette holder 39 is of basically rectangular shape and comprises two complementary parts 56 and 57 which are screwed together. On the inner side of the part 56, at each of the left- and right-hand sides thereof (looking at the front of the recorder), a leaf spring 58 is disposed (only one spring is visible) for pressing the cassette in the direction of the part 57 of the holder. At the rear of the upper part 56, viewed in the open position of the holder (Figure 2), there is located a leaf spring 59 which presses the cassette forwards against a lip 60 on the lower part 57. A cassette inserted in the cassette holder 39 is so positioned relative to the part 57 by the springs 58 and 59 that it assumes a comparatively well-defined position in the cassette holder. In the upper part 56 a light source 61 is mounted, which receives its voltage supply by means of two wires 62 and 63. Opposite the light source 61 a phototransistor 64 is mounted in the part 57 in front of an opening (not visible in the drawing) in the part 57. The phototransistor is provided with two wires 65 and 66 for connection to an electronic circuit which processes the output signal from the phototransistor. The light source 61 and the phototransistor 64 are arranged at locations such that, depending on which way up the cassette 40 is inserted in the holder 39, the light source and the phototransistor can cooperate with the bore 28 or 32 in the relevant tape-guide roller 11 or 12 of the cassette 40 and with the corresponding openings 29, 30 or 33, 34 in the cassette housing. This cooperation is further illustrated in Figure 4, which shows the situation in which the cassette has been inserted in the cassette holder with the part 1 of the cassette housing uppermost. The light source 61 emits a light beam 96, which is incident on the phototransistor 64 once per revolution of the tape guide roller 11. Ths pulsating voltage which is supplied by the phototransistor 64 is applied to an amplifier 67. The output signal of the amplifier is applied to an electronic circuit 68 which counts the pulses from the phototransistor and converts them into suitable signals for a mechanically driven or an electronic digital display unit 69 which is provided with illuminated digits or liquid crystals. The number displayed by the digital display unit 69, which in the present embodiment can display a maximum of four digits, is a measure of the length of magnetic tape which has been wound from reel 7 to reel 8.

The digital display unit 69 is located at the front of the cassette recorder (see Figure 2) next to a second digital display unit 70. This digital display unit can also display a number consisting of four digits, which number can be set with the aid of two push-buttons 71 and 72. The cassette recorder is equipped with a circuit arrangement such that when the numbers displayed by the digital display units 69 and 70 are the same the cassette recorder is automatically turned off.

Figure 5 shows a cassette recorder 36 similar to that shown in Figure 2 but with a modified cassette holder 73 and a modified tape-transport measuring and indicating means. These means are adapted to use a reflected light beam instead of a transmitted light beam and comprise a measuring probe 74 which projects through the bottom 42 of the recess 41 in the front panel 38 of the recorder (see also Figure 7). The cassette holder 73 contains a cassette 75 which is substantially identical to the cassette 40 of Figure 1 with the exception of some modifications in the tape-guide rollers and the cassette housing. Figure 6 shows one of the modified guide rollers, namely, the roller 76 which replaces the guide roller 11 of Figure 1. Unlike the guide roller 11 the guide roller 76 does not have an eccentric axially extending bore. Instead, on at least one end of the tape-guide roller is fixed a disc 77 which is provided with a first and second portion 78 and 79 respectively, having different light-reflecting properties. For example, the portion 78 may be black and the portion 79 white. The housing of the cassette 75 has no openings for the passage of a light beam but is manufactured from a transparent plastics material. Obviously, the housing of the cassette 40 of Figure 1 may be made from a transparent plastics material instead of having openings for the light beam. An alternative possibility is to construct the cassette housing with only local transparent

portions, for example, transparent inserts.

The method of cooperation of the measuring proble 74 with the cassette 75 when the cassette holder 73 is in the closed position is shown in Figure 7. In the lower part 81 of the cassette holder 73 an opening 82 is formed having a cross-section which is slightly greater than that of the measuring probe 74. The measuring probe consists of a transparent plastics body 83 having a projecting portion which extends to a point near the cassette 75 in the closed position of the cassette holder. In the transparent body 83 a lamp 84 is mounted, which can be energized *via* two wires 85 and 86. In a slot in the transparent body 83 is fitted a curved plastics wire 87 which is surrounded by an opaque sheath 88. The plastics wire 87 is made of a transparent material and serves as a light guide. The amount of light which is guided through the transparent wire 87 depends on the reflecting properties of that portion of the end disc 77 of the tape-guide roller 76 which is disposed over the end of the wire 87 at any given moment. If the black portion 78 of the disc 77 is located over the end of the light guide 87, less light will be transmitted by the light guide than when the white portion 79 is at this location. The light transmitted *via* the light guide 87 is used for exposure of a phototransistor 89 at a suitable location in the cassette recorder, which transistor can be connected to a suitable electronic circuit *via* wires 90 and 91. As is shown in Figure 8, the same electronic circuitry can be used for processing the signals from the phototransistor 89 as in the cassette recorder of Figure 2 (see also Figure 4).

Instead of using a surface disposed at the end of the tape-guide roller 76, it is alternatively possible to use the cylindrical surface of the tape-guide roller for reflecting the radiation beam and thus measuring the number of revolutions of the tape-guide roller and consequently the transported length of magnetic tape. This alternative, which is not shown in the drawing, employs a modification of the measuring probe 74 in which the portion of the probe which projects from the bottom 42 of the recess 41 in the front panel of the cassette recorder has a smaller diameter and the housing of the cassette has an opening through which this probe portion can project into the interior of the housing next to the tape-guide roller. The distal end of the measuring probe is modified in such a way that the light is incident on the cylindrical surface of the tape-guide roller in a lateral direction and the reflected light can be picked up by the light guide, for example, by means of an oblique reflecting surface.

For suitable electronic circuits for the electronic section of the tape-transport measuring and indicating means, reference may be made to the manuals available from manufacturers of electronic components.

CLAIMS

1. A combination of a magnetic-tape recording and/or playback apparatus and a magnetic-tape cassette for use on the apparatus, the cassette comprising a housing which accommodates two rotatable winding hubs, a length of magnetic tape connected at one end to one winding hub and at the other end to the other winding hub so that by rotation of the hubs the tape is unwound from one hub and wound on the other hub, and at least one tape-guide roller which is rotatable by the magnetic tape, for guiding the tape during its transport from one hub to the other, and the recording and/or playback apparatus comprising tape-drive means for the transport of the magnetic tape in the cassette from one hub to the other, wherein means are provided for measuring and indicating the length of magnetic tape transported between the hubs and comprising a radiation source for the generation of a radiation beam, a radiation-sensitive electrical element located in the path of the radiation beam, which pulse device is disposed in the path of the radiation beam between the radiation source and the radiation sensitive element and is operable by the tape, during transport thereof, to vary the exposure of the radiation-sensitive element by the radiation beam alternately between a maximum and a minimum value so as to vary an electrical property of the radiation-sensitive element between a maximum and a minimum value, the tape-guide roller, or one of the tape-guide rollers, in the cassette being constructed to serve as the pulse device, and the cassette housing being constructed to allow transmission of the radiation beam into the interior of the housing for cooperation with the tape-guide roller serving as the pulse device.

2. A combination as claimed in Claim 1, wherein the tape-guide roller serving as the pulse device has a bore extending through it at a distance from and parallel to its axis of rotation to permit periodic passage of said radiation beam through the roller during rotation thereof.

3. A combination as claimed in Claim 1, wherein the tape-guide roller serving as the pulse device comprises at least one end of the roller two portions with different radiation-reflecting properties for periodically reflecting said radiation beam during rotation of the roller.

4. A combination as claimed in Claim 1, wherein the tape-guide roller which serves as the pulse device comprises a cylindrical surface having two portions with different radiation-reflecting properties for periodically reflecting said radiation beam during rotation of the roller.

5. A magnetic-tape cassette for the combination claimed in Claim 1, comprising a housing which accommodates two rotatable winding hubs, a length of magnetic tape connected to one end to one winding hub and at the other end to the other winding hub so that by rotation of the hubs the tape is unwound from one hub and wound on the other hub, and at least one tape-guide roller which is rotatable by the magnetic tape, for guiding the tape during its transport from one hub to the other, wherein the tape-guide roller, or one of the tape-guide rollers, is constructed to serve as the pulse device, and the cassette housing is constructed to allow transmission of the radiation beam into the interior of the cassette for cooperation with the

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portions, for example, transparent inserts.

The method of cooperation of the measuring proble 74 with the cassette 75 when the cassette holder 73 is in the closed position is shown in Figure 7. In the lower part 81 of the cassette holder 73 an opening 82 is formed having a cross-section which is slightly greater than that of the measuring probe 74. The measuring probe consists of a transparent plastics body 83 having a projecting portion which extends to a point near the cassette 75 in the closed position of the cassette holder. In the transparent body 83 a lamp 84 is mounted, which can be energized *via* two wires 85 and 86. In a slot in the transparent body 83 is fitted a curved plastics wire 87 which is surrounded by an opaque sheath 88. The plastics wire 87 is made of a transparent material and serves as a light guide. The amount of light which is guided through the transparent wire 87 depends on the reflecting properties of that portion of the end disc 77 of the tape-guide roller 76 which is disposed over the end of the wire 87 at any given moment. If the black portion 78 of the disc 77 is located over the end of the light guide 87, less light will be transmitted by the light guide than when the white portion 79 is at this location. The light transmitted *via* the light guide 87 is used for exposure of a phototransistor 89 at a suitable location in the cassette recorder, which transistor can be connected to a suitable electronic circuit *via* wires 90 and 91. As is shown in Figure 8, the same electronic circuitry can be used for processing the signals from the phototransistor 89 as in the cassette recorder of Figure 2 (see also Figure 4).

Instead of using a surface disposed at the end of the tape-guide roller 76, it is alternatively possible to use the cylindrical surface of the tape-guide roller for reflecting the radiation beam and thus measuring the number of revolutions of the tape-guide roller and consequently the transported length of magnetic tape. This alternative, which is not shown in the drawing, employs a modification of the measuring probe 74 in which the portion of the probe which projects from the bottom 42 of the recess 41 in the front panel of the cassette recorder has a smaller diameter and the housing of the cassette has an opening through which this probe portion can project into the interior of the housing next to the tape-guide roller. The distal end of the measuring probe is modified in such a way that the light is incident on the cylindrical surface of the tape-guide roller in a lateral direction and the reflected light can be picked up by the light guide, for example, by means of an oblique reflecting surface.

For suitable electronic circuits for the electronic section of the tape-transport measuring and indicating means, reference may be made to the manuals available from manufacturers of electronic components.

CLAIMS

1. A combination of a magnetic-tape recording and/or playback apparatus and a magnetic-tape cassette for use on the apparatus, the cassette comprising a housing which accommodates two rotatable winding hubs, a length of magnetic tape connected at one end to one winding hub and at the other end to the other winding hub so that by rotation of the hubs the tape is unwound from one hub and wound on the other hub, and at least one tape-guide roller which is rotatable by the magnetic tape, for guiding the tape during its transport from one hub to the other, and the recording and/or playback apparatus comprising tape-drive means for the transport of the magnetic tape in the cassette from one hub to the other, wherein means are provided for measuring and indicating the length of magnetic tape transported between the hubs and comprising a radiation source for the generation of a radiation beam, a radiation-sensitive electrical element located in the path of the radiation beam, which pulse device is disposed in the path of the radiation beam between the radiation source and the radiation sensitive element and is operable by the tape, during transport thereof, to vary the exposure of the radiation-sensitive element by the radiation beam alternately between a maximum and a minimum value so as to vary an electrical property of the radiation-sensitive element between a maximum and a minimum value, the tape-guide roller, or one of the tape-guide rollers, in the cassette being constructed to serve as the pulse device, and the cassette housing being constructed to allow transmission of the radiation beam into the interior of the housing for cooperation with the tape-guide roller serving as the pulse device.

2. A combination as claimed in Claim 1, wherein the tape-guide roller serving as the pulse device has a bore extending through it at a distance from and parallel to its axis of rotation to permit periodic passage of said radiation beam through the roller during rotation thereof.

3. A combination as claimed in Claim 1, wherein the tape-guide roller serving as the pulse device comprises at least one end of the roller two portions with different radiation-reflecting properties for periodically reflecting said radiation beam during rotation of the roller.

4. A combination as claimed in Claim 1, wherein the tape-guide roller which serves as the pulse device comprises a cylindrical surface having two portions with different radiation-reflecting properties for periodically reflecting said radiation beam during rotation of the roller.

5. A magnetic-tape cassette for the combination claimed in Claim 1, comprising a housing which accommodates two rotatable winding hubs, a length of magnetic tape connected to one end to one winding hub and at the other end to the other winding hub so that by rotation of the hubs the tape is unwound from one hub and wound on the other hub, and at least one tape-guide roller which is rotatable by the magnetic tape, for guiding the tape during its transport from one hub to the other, wherein the tape-guide roller, or one of the tape-guide rollers, is constructed to serve as the pulse device, and the cassette housing is constructed to allow transmission of the radiation beam into the interior of the cassette for cooperation with the

tape-guide roller serving as the pulse device.

6. A magnetic-tape cassette as claimed in Claim 5 for the combination claimed in Claim 2 wherein the tape-guide roller serving as the pulse device has a bore extending through it at a distance from and parallel to its axis of rotation to permit periodic passage of said radiation beam through the roller during rotation thereof.

7. A magnetic-tape cassette as claimed in Claim 5 for the combination claimed in Claim 3, wherein the tape-guide roller serving as the pulse device comprises at least one end of the roller two portions with different radiation-reflecting properties for periodically reflecting said radiation beam during rotation of the roller.

8. A magnetic-tape cassette as claimed in Claim 6 or 7, wherein the cassette housing is constructed with a transparent part to allow transmission of the radiation beam into the interior of the housing.

9. A magnetic-tape cassette as claimed in Claim 5 for the combination claimed in Claim 4, wherein the tape-guide roller which serves as the pulse device comprises a cylindrical surface having two portions with different radiation-reflecting properties for periodically reflecting said radiation beam during rotation of the roller.

10. A combination of a magnetic-tape recording and/or playback apparatus and a magnetic-tape cassette for use on the apparatus, substantially as herein described with reference to Figures 1 to 4 or Figures 5 to 8 of the accompanying drawings.

11. A magnetic-tape cassette substantially as herein described with reference to Figures 1 to 4 or Figures 5 to 8 of the accompanying drawings.

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