

SPECIFICATION

A Tape Reel

This invention relates to a tape reel for devices using tapes, such as a motion-picture projector, a

5 tape recorder and a computer.

Generally, as shown in Figures 1 to 5, a conventional tape reel is constructed of a pair of side discs 1 and 3 supporting the edges of a tape wound on the reel, and an inner hub 2 which

10 serves as a tape winding core. However, conventional tape reels of this kind made of synthetic resin have the defect that curvature or warp is frequently produced in the side discs thereof, especially if the discs are made of a

15 synthetic resin having a high degree of crystallization. Accordingly, when such a tape reel is rotated in use, marked oscillations of the side discs occur so that a tape wound on the reel is liable to be cut due to contact between the tape

20 edges and the side discs of the tape reel, and at the same time distortion of the output signal results. Moreover, with cassette tape, since the space between tape reels and the inner surface of the cassette tape case are generally small, if the

25 curvature or warp of the tape-reel side discs is great, the side discs are liable to abut with the inner surface of the cassette tape case.

A recent attempt to reduce the problem of curvature of tape reel side discs is shown in

30 Figures 6 and 7, in which a side disc 3 of the tape reel is formed as a flat disc having annular ribs 4 and 5 extending around the outer and inner diameter portions respectively of its surface

35 remote from a winding reel 2. The maximum amplitude of the swings or oscillations of such a side disc employed in a tape reel of an audio cassette was 0.5 to 0.6 mm when measured by a

three-dimensional metering device.

As shown in Figures 8 and 9, it is also known

40 to produce a tape reel having a plurality of ribs radially disposed on the outer surface of a side disc 3 remote from a winding core 2. The maximum amplitude of the oscillations of such a side disc were again measured at 0.5 to 0.6 mm

45 when the side disc was employed in a tape reel of an audio cassette.

Upon repeated trials, it has now been found that the oscillations of a tape reel side disc can be decreased when a plurality of coaxial ribs are

50 formed on the outer surface of the side disc spaced from the inner and outer diameter portions of the side disc.

Accordingly, the invention resides in a tape reel made of a synthetic resin material and comprising

55 a pair of side discs having a tape winding core extending therebetween, and a plurality of coaxial ribs each having a width of 1 to 3 mm provided on the outer surface of at least one of the side discs and spaced from the inner and outer

60 diameter portions of the disc, the inner surface of said one side disc defining a flat surface extending between the winding core and the external periphery of the disc.

In the accompanying drawings:

65 Figure 1 is a side view of a conventional tape-reel;

Figure 2 is a plan view of one side disc of the tape reel shown in Figure 1;

70 Figure 3 is a cross section taken along the line III—III in Figure 2;

Figure 4 is a plan view of the other side disc of the tape reel shown in Figure 1;

Figure 5 is a cross section taken along the line V—V in Figure 4;

75 Figure 6 is a plan view of another conventional tape-reel side disc;

Figure 7 is a cross section taken along the line VII—VII in Figure 6;

80 Figure 8 is a plan view of still another conventional tape-reel side disc;

Figure 9 is a cross section taken along the line IX—IX in Figure 8;

85 Figure 10 is a plan view of a tape-reel side disc according to one example of the present invention; and

Figure 11 is a cross section taken along the line XI—XI in Figure 10.

Referring to Figures 10 and 11 the tape reel of said one example of the present invention is

90 formed of a synthetic resin material and includes a side disc 3 having a winding core 2 projecting from the inner surface thereof; the remainder of said inner surface being flat. The other outer surface of the disc 3 is formed with annular ribs 4, 5 extending around the inner and outer diameter portions respectively of said outer surface and

95 between the ribs 4, 5, is formed with three further coaxial ribs 7, 8, 9 each having a height of 0.2 mm. The maximum amplitude of oscillation of the side disc 3 according to said one example of the present invention was 0.2 mm when measured in

100 the same manner as described above, i.e. about 1/2 to 1/3 of that experienced in the prior art tape reels. Thus the tape reel of said one example exhibits little oscillation, in use, and hence the defects which are inherent in conventional tape-reels, such as the cutting of the tape film, the distortion of the projected image and the damage of the tape casing and/or the reel side discs, are

105 minimised.

110 The height, width and number of the ribs in the tape reel of the invention are determined according to the dimensions of the side discs. The rib width is 1 to 3 mm, and desirably the rib

115 height is about 0.1 to 1.0 mm and the number of the ribs is 2 to 10. Preferably, the ribs are provided on the outer surfaces of both side discs of the tape reel.

Claims

120 1. A tape reel made of a synthetic resin material and comprising a pair of side discs having a tape winding core extending therebetween, and a plurality of coaxial ribs each having a width of 1 to 3 mm provided on the

125 outer surface of at least one of the side discs and spaced from the inner and outer diameter portions of the disc, the inner surface of said one



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Generally, as shown in Figures 1 to 5, a conventional tape reel is constructed of a pair of side discs 1 and 3 supporting the edges of a tape wound on the reel, and an inner hub 2 which serves as a tape winding core. However, conventional tape reels of this kind made of synthetic resin have the defect that curvature or warp is frequently produced in the side discs thereof, especially if the discs are made of a synthetic resin having a high degree of crystallization. Accordingly, when such a tape reel is rotated in use, marked oscillations of the side discs occur so that a tape wound on the reel is liable to be cut due to contact between the tape edges and the side discs of the tape reel, and at the same time distortion of the output signal results. Moreover, with cassette tape, since the space between tape reels and the inner surface of the cassette tape case are generally small, if the curvature or warp of the tape-reel side discs is great, the side discs are liable to abut with the inner surface of the cassette tape case.

A recent attempt to reduce the problem of curvature of tape reel side discs is shown in Figures 6 and 7, in which a side disc 3 of the tape reel is formed as a flat disc having annular ribs 4 and 5 extending around the outer and inner diameter portions respectively of its surface remote from a winding reel 2. The maximum amplitude of the swings or oscillations of such a side disc employed in a tape reel of an audio cassette was 0.5 to 0.6 mm when measured by a three-dimensional metering device.

As shown in Figures 8 and 9, it is also known to produce a tape reel having a plurality of ribs radially disposed on the outer surface of a side disc 3 remote from a winding core 2. The maximum amplitude of the oscillations of such a side disc were again measured at 0.5 to 0.6 mm when the side disc was employed in a tape reel of an audio cassette.

Upon repeated trials, it has now been found that the oscillations of a tape reel side disc can be decreased when a plurality of coaxial ribs are formed on the outer surface of the side disc spaced from the inner and outer diameter portions of the side disc.

Accordingly, the invention resides in a tape reel made of a synthetic resin material and comprising a pair of side discs having a tape winding core extending therebetween, and a plurality of coaxial ribs each having a width of 1 to 3 mm provided on the outer surface of at least one of the side discs and spaced from the inner and outer diameter portions of the disc, the inner surface of said one side disc defining a flat surface extending between the winding core and the external periphery of the disc.

In the accompanying drawings:

65 Figure 1 is a side view of a conventional tape-reel;

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Referring to Figures 10 and 11 the tape reel of said one example of the present invention is formed of a synthetic resin material and includes a side disc 3 having a winding core 2 projecting from the inner surface thereof; the remainder of said inner surface being flat. The other outer surface of the disc 3 is formed with annular ribs 4, 5 extending around the inner and outer diameter portions respectively of said outer surface and between the ribs 4, 5, is formed with three further coaxial ribs 7, 8, 9 each having a height of 0.2 mm. The maximum amplitude of oscillation of the side disc 3 according to said one example of the present invention was 0.2 mm when measured in the same manner as described above, i.e. about 1/2 to 1/3 of that experienced in the prior art tape reels. Thus the tape reel of said one example exhibits little oscillation, in use, and hence the defects which are inherent in conventional tape-reels, such as the cutting of the tape film, the distortion of the projected image and the damage of the tape casing and/or the reel side discs, are minimised.

The height, width and number of the ribs in the tape reel of the invention are determined according to the dimensions of the side discs. The rib width is 1 to 3 mm, and desirably the rib height is about 0.1 to 1.0 mm and the number of the ribs is 2 to 10. Preferably, the ribs are provided on the outer surfaces of both side discs of the tape reel.

Claims

1. A tape reel made of a synthetic resin material and comprising a pair of side discs having a tape winding core extending therebetween, and a plurality of coaxial ribs each having a width of 1 to 3 mm provided on the outer surface of at least one of the side discs and spaced from the inner and outer diameter portions of the disc, the inner surface of said one

side disc defining a flat surface extending between the winding core and the external periphery of the disc.

2. A tape reel as claimed in Claim 1, wherein
5 the height of each rib, from the outer surface of the side disc is 0.1 to 1.0 mm.

3. A tape reel as claimed in Claim 1 or Claim 2, wherein there are between 2 and 10 of said ribs.

4. A tape reel as claimed in any preceding
10 Claim, wherein the outer surface of the other side disc is also provided with a plurality of said ribs

spaced from the inner and outer diameter portions of the disc.

5. A tape reel as claimed in any preceding
15 Claim, wherein the outer surface of the or each side disc is provided with further ribs extending around its inner and outer diameter portions respectively.

6. A tape reel as claimed in Claim 1,
20 substantially as hereinbefore described with reference to Figures 10 and 11 of the accompanying drawings.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1982. Published by the Patent Office,
25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

