

REEL RECEIVER FOR A MAGNETIC TAPE
FEEDING DEVICE

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to a reel receiver for a magnetic tape feeding device.

5 Description of the Prior Art

A typical one of conventional reel receivers for a magnetic tape feeding device has a drivable sleeve journaled on a fixed, upright shaft. A reel driving member is mounted on the sleeve and is likewise
10 journaled on the fixed shaft at its upper end, the reel driving member being prevented from coming off the fixed shaft by a lock washer fitted in a circumferential groove at the top of the shaft.

SUMMARY OF THE INVENTION

15 It is an object of the invention to provide an improved reel receiver for a magnetic tape feeding device wherein loading of a cassette thereto and assembly thereof is facilitated.

According to the invention, there is provided

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a reel receiver for a magnetic tape feeding device comprising a shaft member having a base end thereof secured to a chassis and having a circumferential groove formed around an intermediate portion thereof, a drivable
5 reel receiver base member mounted for rotation on said shaft member, a reel driving member having an axial center hole formed therein in which said reel receiver base member is press fitted, said hole having an end closed by a top end portion of said reel driving member,
10 said reel driving member further having a bearing recess formed in said top end portion thereof in a contiguous relationship to said hole and receiving an end portion of said shaft member therein, and a locking member for said base member for locking said base member on
15 said shaft member, said locking member being positioned in said hole of said reel driving member and having an axial center hole formed therein through which said shaft member extends, said locking member being at least partially received in said circumferential groove
20 of said shaft member.

With the construction of the invention described in the immediately preceding paragraph, by pushing the reel driving member together with the reel receiver base member onto the shaft member, with the locking
25 member positioned in the hole in the reel driving member,

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the locking member is automatically fitted into the groove of the shaft member. Accordingly, the troublesome operation of separately fitting a lock washer to a groove in the shaft as in the conventional arrangement, is avoided. Further, since the top of the reel driving member is closed, the top of the reel driving member can be rounded to facilitate loading of a cassette, and closing the top end of the reel driving member prevents the entry of dust into the assemblage.

10 A specific embodiment of the present invention will hereinafter be described in detail by way of example with reference to certain figures of the accompanying drawings, one of which illustrates a conventional arrangement.

15 BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a reel receiver for a magnetic tape feeding device according to the present invention;

FIG. 2 is a sectional view taken along line II-II of Figure 1; and

20 FIG. 3 is a view similar to Figure 2 but showing a conventional reel receiver for a magnetic tape feeding device.

DETAILED DESCRIPTION WITH REFERENCE TO
THE ACCOMPANYING DRAWINGS

Referring to Figure 3, in the prior art arrangement, a sleeve 34 is mounted for rotation on a fixed shaft member 32 secured at a base end thereof to a chassis 31. The sleeve is formed as the hub of a gear wheel. A reel driving member 35 is press-fitted on the sleeve 34 and a lock washer 36 is fitted in a circumferential groove 32a of the shaft member 32 to prevent the sleeve 34 and the reel driving member 35 from coming off the shaft member 32.

This kind of arrangement has the following problems. If the shaft member 32 extends upwardly from the top of the reel driving member 35, the vertical dimension of the entire reel receiver tends to be increased, which is an objectionable design feature. Therefore, in the usual prior art arrangement, the reel driving member 35 has a recess 40 formed therein and the lock washer 36 is located within the recess 40 so that the shaft member 32 does not extend upwardly from the reel driving member 35. However, the recess 40 necessarily has a comparatively large diameter, and the reel driving member 35 has, therefore, a large flat face at the top thereof, which makes loading of a cassette difficult. Therefore, the diameter of the

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recess 40 is conventionally made as small as possible, involving reduction of the size of the washer 36. However, it is a very difficult operation to fit a washer 36 of small size into an annular groove 32a of the shaft member 32 within the recess 40 if this is of a small diameter. Besides, due to the necessity for mounting of the washer 36, the end of the reel driving member 35 must necessarily be open. This raises a problem that dust may enter the bearings between the shaft member 32 and the sleeve 34 and between the shaft member 32 and the reel driving member 35 by way of the opening at the top of the reel driving member 35.

Referring now to Figures 1 and 2 in an arrangement according to the present invention, a fixed, reel mounting metal shaft 12 is rivetted at a base end 18 thereof to a metal plate chassis 11. The shaft 12 has a circumferential groove 12a adjacent the upper, free end thereof.

A synthetic resin reel receiver sleeve base member 14 having an integral gear 13 is journalled as at 17 on the shaft 12. A synthetic resin reel driving member 15 for engaging with a reel of a cassette (not shown) is fixed to the sleeve 14 by press fitting. The member 15 has three exterior reel engaging projections

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15b and an inner bore or axial center hole 19 formed therein. The inner bore 19 is open at the lower end thereof, and an upper portion of the sleeve 14 is press fitted in the lower portion of the inner bore 19 of the reel driving member 15. The upper end of the inner bore 19 is closed by a top portion 15c of the reel driving member 15, and the top portion 15c is rounded and tapers off upwardly. A bearing recess 15a, formed in contiguous co-axial relationship with the inner bore 19 in the top portion 15c of the reel driving member 15 journals the free end of the shaft 12.

A stepped, hollow generally cylindrical member 16 is fitted on the shaft 12 for preventing the sleeve 14 from coming off the reel mounting shaft 12. The member 16 is accommodated in a space in the inner bore 19 above the sleeve 14. The member 16 is made of an elastomeric material such as a synthetic resin material and has a major outer diameter substantially equal to or a little greater than the diameter of the bore 19. The inner diameter of the member 16 is enlarged at 16c over an intermediate portion of its length and is thus spaced from the outer periphery of the shaft 12 as seen in Figure 2 but the member 16 has an upper portion 16a and a lower portion 16b.

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The upper portion 16a has an inner diameter about the same as or a little larger than the outer diameter of the bottom of the groove 12a and the portion 16b has an inner diameter a little smaller than the major diameter of the shaft 12 and when the member 16 is fitted in position on the shaft 12, the upper end portion 16a thereof is received or fitted in the groove 12a adjacent the free end of the shaft 12 to prevent the member 16 from coming off the shaft 12 and the lower end portion 16b grips the shaft with a tight fit. The lower end portion 16b of the member 16 is stepped at its outer diameter which is smaller than the diameter of the bore 19 of the member 15 and hence the portion 16b is spaced from the inner periphery of the member 15 as seen in Figure 2.

In assembling the components mentioned above, first the member 16 is inserted into the bore 19 of the reel driving member 15, then the reel driving member 15 is pushed onto the sleeve 14 to press fit the member 15 onto the sleeve 14. Then, the sleeve 14 and the reel driving member 15 are pushed onto the reel mounting shaft 12 so that the member 16 is pushed downwardly onto the shaft 12 until the narrowed portion 16a thereof is fitted into the groove 12a.

As the member 16 is fitted in this manner,

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at first the elasticity or resiliency of the member 16 itself and a chamfer at the extreme top end of the shaft 12 allow the lower end portion 16b of the member 16 to be expanded outwardly to allow the member 16 to be fitted on the shaft 12. The reduced outer diameter of the portion 16b of the member 16 prevents the portion 16b from interfering with the inner wall of the reel driving member 15 to hinder the passage of the shaft 12 through the cylindrical member 16. To facilitate the entry of the major diameter of the shaft 12 through the lower end portion 16b of the member 16, the top end of the major diameter portion of the shaft 12 below the annular groove 12a is also chamfered.

Thus, as may be seen from the drawings, the member 16 has an axial length sufficient to bridge the annular groove 12a of the shaft 12 while abutting the upper shoulder of the shaft provided by the groove 12a.

Once the member 16 is fitted in position on the reel mounting shaft 12, its lower end portion 16b resiliently grips the major diameter of the shaft 12.

Meanwhile, once the portion 16a of the member 16 is fitted in the groove 12a, if the reel driving

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member 15 is removed, the sleeve 14 is, nevertheless, prevented from being pulled off the reel mounting shaft 12 by the member 16.

It is to be noted that where the major outer diameter of the cylindrical member 16 is a little greater than the diameter of the bore 19 of the reel driving member 15, the inner diameter of the lower end portion 16b of the member 16 in the free condition of the members need not be less than the major outer diameter of the shaft 12 in order to establish a close fitting contact therebetween because, in that case, the inner wall of the reel driving member 15 presses against the outer periphery of the cylindrical member 16 to contract the lower end portion 16b of the cylindrical member 16.

Thus, according to the present embodiment, fitting of the portion 16a of the cylindrical member 16 into the groove 12a can be automatically achieved simply by pushing the reel driving member 15 press fitted with the sleeve 14 onto the reel mounting shaft 12. Accordingly, such a troublesome operation as fitting a lock washer into a groove with a reel driving member held in a pushed down position, as in a conventional arrangement, becomes unnecessary, and hence assembly of the entire arrangement can be achieved

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very easily. Further, since the top end of the reel driving member 15 is closed, it can be smoothly rounded to facilitate the loading of a cassette. Besides, since the top end of the reel driving member 15 is closed, the disadvantage that dust may enter between the reel mounting shaft 12 and the sleeve 14 is eliminated. In addition, since outer and inner peripheries of the cylindrical member 16 are held in contact with an inner periphery of the reel driving member 15 and an outer periphery of the reel mounting shaft 12 respectively, if the reel receiver is employed for tape rewinding, that is, for a supply reel, a braking effect is obtained so that slackening of a tape is eliminated, by the resistance applied to rotation of the reel driving member 15 by the cylindrical member 16. The member 16 may be formed simply as a coming off preventing member, by fitting into the groove 12a of the shaft 12 upon assembly of the components in the manner described. Accordingly, it may only have an inner diameter portion thereof to interfit with the groove. Further, the member 16 may be made of any material of suitable elasticity, and for example, nylon may be used therefor. Further, or alternatively, it is also possible to form a recess or an axial slit in the member 16 in order to increase



its elasticity and hence its deformability to allow it to be fitted during the assembly.

As described in detail hereinabove, with reference to the accompanying drawings, in a reel receiver for a magnetic tape feeding device a
5 cylindrical member as a coming off preventing member, can be fitted into a groove adjacent an end portion of a shaft member simply by pushing the reel driving member onto the shaft member. Accordingly, an effect
10 is obtained that the reel driving member can be assembled very easily. Further, since the top end of the reel driving member is closed, another effect is obtained that dust is prevented from entering between the journals and the journal bearings. In addition,
15 since the top end of the reel driving member is rounded, a further effect is obtained that the loading of a cassette is facilitated.

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CLAIMS:

1. A reel receiver for a magnetic tape feeding device, comprising a shaft member having a base end thereof secured to a chassis and having a circumferential groove formed around an intermediate portion thereof, a drivable reel receiver base member mounted for rotation on said shaft member, a reel driving member having an axial center hole formed therein in which said reel receiver base member is press fitted, said hole having an end closed by a top end portion of said reel driving member, said reel driving member further having a bearing recess formed in said top end portion thereof in a contiguous relationship to said hole and receiving an end portion of said shaft member therein, and a locking member for said base member for locking said base member on said shaft member, said locking member being positioned in said hole of said reel driving member and having an axial center hole formed therein through which said shaft member extends, said locking member being at least partially received in said circumferential groove of said shaft member.

2. A reel receiver according to claim 1, wherein outer and inner peripheries of said locking member are in contact with an inner periphery of said





reel driving member and an outer periphery of said shaft member, respectively.

3. A reel receiver according to claim 1 or 2, wherein said center hole of said locking member has, at one end portion thereof, an inner diameter smaller than the outer diameter of said shaft member, said one end portion of said locking member being received in said annular groove of said shaft member to lock said base member to said shaft member.

4. A reel receiver according to claim 3 wherein said locking member has an outer diameter substantially equal to or a little greater than the diameter of said center hole of said reel driving member in which said locking member is located.

5. A reel receiver according to claim 3 or 4 wherein said center hole of said locking member has, at the other end portion thereof, an inner diameter a little smaller than the major outer diameter of said shaft member, said other end portion of said locking member engaging the major diameter of said shaft member between said groove and the base end of the shaft member.

6. A reel receiver according to claim 5 wherein the other end portion of said locking member has a smaller outer diameter than the inner diameter of



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said center hole of said reel receiver base member.

7. A reel receiver according to claim 6 wherein the other end portion of said locking member has an axial length greater than the axial length of said
5 groove.

8. A reel receiver for a magnetic tape feeding device according to claim 6 wherein said shaft member is chamfered adjacent said groove to facilitate the fitting of said locking member on said shaft member.

10 9. A reel receiver for a magnetic tape feeding device substantially as hereinbefore described with reference to, and as shown in, Figures 1 and 2 of the accompanying drawings.

