

"TAPE CASSETTE HOLDER"

This invention relates to a tape cassette holder in a cassette tape recorder, and especially to a tape cassette holder allowing a free end of a spring member, which biases a tape cassette toward a head, to assume the same position while no tape cassette is loaded.

As is known very well, relatively firm holding of a tape cassette on a chassis of a tape recorder is indispensable upon loading the tape cassette on a tape cassette loading part provided on the chassis. If this firm holding should be insufficient, the positional relationship between a head and magnetic tape varies during running of the magnetic tape so that desired performance cannot be exhibited.

For the reasons mentioned above, conventional cassette tape recorders are usually provided with cassette supports 2,3 at a cassette mounting position on a chassis 1 as shown in FIGURE 3 so as to regulate the height of a tape cassette 4 relative to the chassis 1 by the cassette supports 2,3. A leaf spring 5 is also provided upright behind the cassette mounting position, whereby the tape cassette 4 is pressed toward

a head by an end portion of the leaf spring 5. At the position behind the cassette mounting position, the leaf spring 5 is fixedly secured at a base portion thereof on the chassis 1 by means of a screw or the like. The leaf spring 5 is bent in the form of an opened "V" from the fixed portion toward the cassette support 2 so that a free end portion of the leaf spring extends to a point above the cassette support 2. An arcuate portion 6 is also formed in the free end portion. When the tape cassette 4 has been loaded on the cassette supports 2,3, a lower part of the arcuate portion 6 is forced to contact with the edge of a rear portion of the tape cassette 4. The resulting deflection applies forces, which are directed toward the head and chassis respectively, to the tape cassette 4. Accordingly, the tape cassette 4 is held firmly on the cassette supports 2,3, namely, on the chassis 1. Incidentally, numeral 7 indicates a reel shaft in FIGURE 3.

Conventional so-called cassette holders constructed as described above are however accompanied by the following problems. Namely, the strength of the pressing force of the leaf spring 5 toward the head and that of the pressing force of the leaf spring 5 toward the chassis are proportional to the degree of the initial bending of the leaf spring 5. Compared with a

bending degree indicated by two-dot chain lines A in FIGURE 4, a bending degree indicated by B can hold the tape cassette 4 more firmly. If an initial bending degree is set like B, the free end portion of the leaf spring 5 assumes a position at a point far front of a point above the cassette support 2 while no tape cassette is loaded. Problems may hence arise that the leaf spring 5 is deformed or the loading and unloading of the tape cassette 4 may be impeded depending on the direction of loading of the tape cassette 4, namely, when the loading of the tape cassette 4 is effected in a direction as indicated by two-dot lines in FIGURE 4. It may hence be contemplated to solve such inconvenience by increasing the thickness of the leaf spring 5 to enlarge the restoring force of the leaf spring 5 and hence to decrease its initial bending degree. This approach is however accompanied by a problem that a higher cost is required for the production of the leaf spring 5.

As has been described above, conventional cassette holders are accompanied by a problem that when one attempts to hold a tape cassette firmly on a chassis without increasing the thickness of a spring member, the spring member may be deformed upon loading or unloading a tape cassette or the loading or unloading operation of a tape cassette may be impeded.

An object of this invention is therefore to provide a tape cassette holder which in spite of its simple structure, can prevent occurrence of the above-described inconvenience without need for increasing the thickness of a spring member.

The present inventor has carried out an extensive investigation with a view toward fulfilling the above object of this invention. As a result, it has been found that the object of this invention can be achieved by maintaining a spring member in contact under stress with a cassette support while a tape cassette is unloaded.

In one aspect of this invention, there is thus provided a tape cassette holder equipped with a cassette support and a spring member. The cassette support is formed on a chassis of a cassette tape recorder so as to determine the height of a tape cassette relative to the chassis. The spring member biases the tape cassette, the height of which has been determined relative to the chassis by the cassette support, toward a head of the cassette tape recorder. The spring member is fixed at one end portion thereof on the chassis and biases at the other end portion thereof the tape cassette toward the head. The spring

member is maintained in contact under stress with the cassette support while the tape cassette is unloaded.

When the spring member is maintained at an intermediate portion thereof in contact under stress with the cassette support, the position of the free end of the spring member is obviously regulated at the same position by the contact under the force irrespective of the force of the spring member. It is hence possible to increase the spring force of the spring member and hence to strengthen the pressing force, namely, the holding force for the tape cassette without increasing the thickness of the spring member and moreover by disposing the spring member with its free end positioned at a location not impeding the loading and unloading of the tape cassette.

Therefore, the tape cassette holder of this invention can surely exhibit its cassette-holding function without need for increasing the thickness or diameter of the spring member, moreover without impeding the loading and unloading of the tape cassette by the spring member, and further without the danger of possible deformation of the spring member upon loading or unloading the tape cassette.

The above and other objects, features and advan-

tages of the present invention will become apparent from the following description and the appended claims, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a fragmentary perspective view of a tape cassette holder according to one embodiment of this invention;

FIGURE 2 is a fragmentary side view of the tape cassette holder with a tape cassette loaded on the holder;

FIGURE 3 is a side view of a conventional tape cassette holder; and

FIGURE 4 illustrates problems of the conventional tape cassette holder.

The tape cassette holder according to the one embodiment of this invention will hereinafter be described with reference to FIGURES 1 and 2, in which like elements of structure to those shown in FIGURES 3 and 4 are identified by like reference numerals.

In the tape cassette holder of this embodiment, a leaf spring 5 which applies forces toward both head (not illustrated) and chassis 1 respectively is maintained at an intermediate portion thereof in

contact under stress with a rear end portion of a cassette support 2 while the tape cassette 4 is unloaded. A projection 11 which extends rearwardly is formed integrally at the rear end portion of the cassette support 2 and the leaf spring 5 is maintained at the intermediate portion thereof in contact under stress with the projection 11. The projection 11 serves to maintain the leaf spring 5 apart from the upper edge of the cassette support 2, whereby the loading of the tape cassette 4 is facilitated. The cassette support 2 has been formed by slitting a part of the chassis 1 in the form of an elongated U and then raising the thus-slit part upright relative to the chassis 1.

Owing to the above-described structure, the restoring turning angle of the leaf spring 5 toward the cassette support 2 is regulated by the projection 11 provided on the cassette support 2 while no tape cassette is loaded. Hence, the position of the free end of the leaf spring 5 is naturally maintained at the same position while no tape cassette is loaded. The loading and unloading of the tape cassette 4 are not impeded at all and the leaf spring 5 is not subjected to deformation upon loading the cassette 4 even when the initial bending degree of the leaf spring 5 is increased at the time of its assembly to increase its

restoring force and thus the pressing force of the leaf spring 5 against the tape cassette 4, provided that the height of the projection is determined beforehand so as to allow the free end of the leaf spring 5 to assume a position not impeding the loading and unloading of the tape cassette 4 while no tape cassette is loaded. Namely, the above structure allows to exhibit the cassette holding function surely without need for increasing the thickness of the leaf spring 5, further without impeding the loading and unloading of the tape cassette 4, and moreover without the potential danger that the leaf spring 5 is subjected to deformation upon loading the tape cassette 4.

The leaf spring is used as a spring member in the above-described embodiment. A bar or rod spring may also be used instead of the leaf spring.



CLAIMS:

1. A tape cassette holder equipped with a cassette support and a spring member, said cassette support being formed on a chassis of a cassette tape recorder and adapted to determine the height of a tape cassette relative to the chassis, and said spring member biasing the tape cassette, the height of which has been determined relative to the chassis by the cassette support, toward a head of the cassette tape recorder, characterized in that the spring member is fixed at one end portion thereof on the chassis and biases at the other end portion thereof the tape cassette toward the head, and while the tape cassette is unloaded, the spring member is maintained in contact under stress with the cassette support.

2. A tape cassette holder according to Claim 1, wherein the spring member is a leaf spring.

3. A tape cassette holder according to Claim 1 or 2, wherein cassette support has been formed by slitting a part of the chassis in the form of an elongated U and then raising the thus-slit part upright relative to the chassis.



- 10 -

4. A tape cassette holder according to any one of the preceding claims, wherein the cassette support has a projection on a side facing the spring member and the spring member is in contact under stress with the projection of the cassette support while the tape cassette is unloaded.

5. A tape cassette holder substantially as hereinbefore described with reference to, and as shown in, FIGURES 1 and 2 of the accompanying drawings.

---