

## COMMONWEALTH OF AUSTRALIA

## PATENTS ACT 1952

## APPLICATION FOR A STANDARD PATENT

I\We,

SONY CORPORATION

of

7-35 KITASHINAGAWA 6-CHOME  
SHINAGAWA-KU  
TOKYO  
JAPAN

hereby apply for the grant of a standard patent for an invention entitled:

MAGNETIC TAPE CASSETTE WITH REEL BRAKE.

which is described in the accompanying complete specification

Details of basic application(s):

| Number of basic application | Name of Convention country in which basic application was filed | Date of basic application |
|-----------------------------|---|---------------------------|
| 330839/1989                 | JP  | 20 DEC 89                 |

My/our address for service is care of GRIFFITH HACK & CO.,  
Patent Attorneys, 601 St. Kilda Road, Melbourne 3004,  
Victoria, Australia.

DATED this 11th day of December 1990

SONY CORPORATION

GRIFFITH HACK & CO



TO: The Commissioner of Patents.

M 023543 11-290

AUSTRALIA  
PATENTS ACT 1952

B

APPLICATION  
BY ASSIGNEE  
OF INVENTOR

DECLARATION IN SUPPORT OF AN APPLICATION  
FOR A PATENT

NAME OF  
APPLICANT

In support of an application made by:  
SONY CORPORATION

TITLE

for a patent for an invention entitled:  
MAGNETIC TAPE CASSETTE WITH REEL BRAKE

FULL NAME AND  
ADDRESS OF  
SIGNATORY

I, Yujiro Yamanaka  
of c/o SONY CORPORATION, 7-35, Kitashinagawa  
6-chome, Shinagawa-ku, Tokyo, Japan

do solemnly and sincerely declare as follows:

1. I am authorised by the above mentioned applicant for the patent to make this declaration on its behalf.

2. The name and address of each actual inventor of the invention is as follows:  
MASANOBU SUGIYAMA

of c/o SONY MAGNETIC PRODUCTS, INC.  
5-6, Kitashinagawa 6-chome,  
Shinagawa-ku, Tokyo, Japan

3. The facts upon which the applicant is entitled to make this application are as follows:

The applicant is the assignee of  
the actual inventor(s).

4. The basic application(s) as defined by Section 141 of the Act was (were) made as follows:

Country Japan on December 20, 1989

in the name(s) SONY CORPORATION

and in \_\_\_\_\_ on \_\_\_\_\_

in the name(s) \_\_\_\_\_

5. The basic application(s) referred to in the preceding paragraph was (were) the first application(s) made in a Convention country in respect of the invention the subject of this application.

Declared at Tokyo, Japan

this 3rd day of Decmeber 1990

Signed Yujiro Yamanaka  
Position Manager, Intellectual Property Gp.



FULL NAME AND  
ADDRESS OF  
INVENTOR(S)

SEE NOTES OVER



DELETE PARAGRAPHS  
AND 4 FOR  
NON CONVENTION  
APPLICATION



PLACE AND DATE OF  
SIGNING

GRIFFITH HACK & CO

PATENT AND TRADE MARK ATTORNEYS

MELBOURNE · SYDNEY · PERTH



AU9067939

**(12) PATENT ABRIDGMENT (11) Document No. AU-B-67939/90**  
**(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 638516**

- (54) Title  
**MAGNETIC TAPE CASSETTE WITH REEL BRAKE**
- International Patent Classification(s)  
(51)<sup>5</sup> **G11B 023/087**
- (21) Application No. : **67939/90** (22) Application Date : **11.12.90**
- (30) Priority Data
- (31) Number (32) Date (33) Country  
**1-330839 20.12.89 JP JAPAN**
- (43) Publication Date : **27.06.91**
- (44) Publication Date of Accepted Application : **01.07.93**
- (71) Applicant(s)  
**SONY CORPORATION**
- (72) Inventor(s)  
**MASANOBU SUGIYAMA**
- (74) Attorney or Agent  
**GRIFFITH HACK & CO , GPO Box 1285K, MELBOURNE VIC 3001**
- (56) Prior Art Documents  
**EP 323199**  
**EP 312891**  
**EP 311920**
- (57) Claim

1. A magnetic tape cassette having a cassette casing formed of upper and lower parts, reel hubs accommodated within said cassette casing and around which a magnetic tape is wound, a locking member for locking said reel hubs, reel shaft insertion apertures through which said reel hubs can be engaged, a slider for opening and closing said reel shaft insertion apertures, a slider lock member provided on the part through which said reel shaft insertion apertures are formed and for locking said slider at an opening position and at a closing position and limiter pins for preventing said slider lock member from being deformed more than is necessary, said magnetic tape cassette further comprising:

a hub lock spring having a first spring portion for spring-biasing said hub lock member in the direction in which it locks said reel hubs, said hub lock spring also having a second spring portion for spring-biasing said slider lock member in the direction in which it locks said slider.

638516

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Form 10

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE

Short Title:

Int. Cl:

Application Number:  
Lodged:

Complete Specification-Lodged:  
Accepted:  
Lapsed:  
Published:

Priority:

Related Art:

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TO BE COMPLETED BY APPLICANT

Name of Applicant:

SONY CORPORATION

Address of Applicant: 7-35 KITASHINAGAWA 6-CHOME  
SHINAGAWA-KU  
TOKYO  
JAPAN

Actual Inventor:

Address for Service: GRIFFITH HACK & CO.,  
601 St. Kilda Road,  
Melbourne, Victoria 3004,  
Australia.

Complete Specification for the invention entitled:  
MAGNETIC TAPE CASSETTE WITH REEL BRAKE.

The following statement is a full description of this invention including the best method of performing it known to me:-

BACKGROUND OF THE INVENTIONField of the Invention

The present invention generally relates to magnetic tape cassettes and, more particularly, is directed to a magnetic tape cassette which can be applied to a digital audio tape recorder using a rotary head (i.e. R-DAT).

Description of the Prior Art

A digital audio tape recorder has been proposed so far, in which an analog signal such as an audio signal or the like is converted to a digital signal and this digital signal is recorded on and/or reproduced from a magnetic tape. As such digital audio tape recorder, the R-DAT is proposed, which utilizes a rotary head to provide a high recording density.

In the magnetic tape cassette used in the high density recording, if a magnetic tape is smudged by oily components such as fingerprints and dusts or the like, a drop-out occurs in a reproduced signal. Therefore, in order to avoid the occurrence of such drop-out, the magnetic tape must be shielded within the magnetic tape cassette.

An arrangement of a magnetic tape cassette of a shield type for the DAT will be explained with reference to Figs. 1 to 4.

As illustrated, a magnetic tape cassette represented by reference numeral 1 includes a cassette casing 2, and the cassette casing 2 is formed by fastening an upper half or upper part 3 and a lower half or lower part 4 ~~part 2 and a lower half or lower part 3~~ by some suitable means such as screws or the like. A pair of reel shaft insertion apertures 5 are bored through the lower part 4, and a pair of reel hubs 7 around which a magnetic tape 6 is wound are rotatably supported on the pair of reel hubs 7. The magnetic tape 6 wound around the reel hubs 7 is extended between left and right tape



guides 8 provided at the lower half 4 and is exposed to a front surface opening portion 9 of the cassette casing 2.

At the front portion of the lower part 4, a loading pocket portion 10 is formed, and this pocket portion 10 has a recess portion of U-letter configuration formed at its portion corresponding to the rear side of the magnetic tape 6 exposed to the front opening portion 9. When this magnetic tape cassette is loaded onto a magnetic recording and reproducing apparatus (not shown), a tape loading guide member on the apparatus side enters this pocket portion 10 and withdraws the magnetic tape 6 <sup>through</sup> to the front of the cassette casing 2 (so-called tape loading is performed).

A transparent window portion 11 is formed on the upper part 3, and the user can visually confirm the tape volume of this magnetic tape 6 wound around the reel hubs 7 via this transparent window portion 11. A front lid 12 which opens and closes the front surface opening portion 9 of the cassette casing 2 is attached to the front end portion of the upper half 3 so that it can be rotated in the up to lower direction. When the magnetic tape cassette 1 is not in use, the front surface opening portion 9, i.e. the magnetic tape exposed portion is closed by the front lid 12. When this magnetic tape cassette is loaded onto the magnetic recording and reproducing apparatus, the front lid 12 is opened and rotated in the up direction by a mechanism on the apparatus side, thereby the magnetic tape 6 being exposed to the outside.

Further, as shown in Fig. 3, a hub lock member 13 is assembled within the cassette casing 2 so as to inhibit the left and right reel hubs 7 from being rotated uselessly when the magnetic tape cassette is not in use.



The hub lock member 13 is provided with engaging protrusions 13a which correspond with engaging slits 7a formed around the outer peripheral portions of the reel hubs 7. The hub lock member 13 is always spring-biased in the locking direction by a hub lock spring 14 secured to a spring securing portion 13b provided at the central portion of hub lock member 13. The hub lock spring 14 might be formed of a torsion spring. More specifically, the hub lock spring 14 extends its two ends as substantially inverted V-letter configuration and two ends 14a of the hub lock spring 14 are brought in contact with a front wall 3a of the upper part 3, whereby the hub lock member 13 is always spring-biased in the rear direction, i.e. in the direction in which the engaging protrusions 13a are engaged with the engaging slits 7a of the reel hubs 7. Thus, the reel hubs 7 are locked so as not to rotate when the magnetic tape cassette 1 is not in use.

When the magnetic tape cassette 1 is loaded onto the magnetic recording and reproducing apparatus and the front lid 12 is opened upwardly and rotated as described above, rear end portions 12a of two side surfaces of the front lid 12 are brought in contact with and in engagement with engaging portions 13c elongated to the front portions of the two end portions of the hub lock member 13 to thereby withdraw the engaging portions 13c. Therefore, the hub lock member 13 is moved in the front side, i.e. in the direction in which the engaging protrusions 13a are disengaged from the engaging slits 7a of the reel hubs 7 while spring-biasing the torsion spring 14 in its opening direction, thus releasing the reel hubs 7 from their locked conditions.

The hub lock member 13 is assembled within the cassette casing 2 at the same time when the upper and lower parts 3 and 4 are fastened together under the condition such that the hub lock

member 13 is slidably engaged on the upper part 3 in the front to back direction beforehand in the assembly process of the magnetic tape cassette. An engaging structure in which the hub lock member 13 is engaged with the upper part 3 will be explained hereinafter. Rectangular openings 15 long in the front to back direction are bored through the left and right portions of the hub lock member 13 and the hub lock member 13 attached to the upper part 3 by caulking pins 16 formed on the inner surface side of the upper part 3 within the rectangular openings 15. Therefore, the hub lock member 13 is slidably moved along the inner surface of the upper part 3 in the front to back direction.

A sliding member or slider 17 is attached to the bottom surface of the lower part 4 of the cassette casing 2 so as to become slidable in the front to back direction. When the magnetic tape cassette is not in use, the slider 17 is located at the front closing position and closes the pocket portion 10 and the reel shaft insertion apertures 5 of the lower part 4.

Further, when the magnetic tape cassette is loaded onto the magnetic recording and reproducing apparatus, the slider 17 is slidably moved to the rear opening position by a mechanism of the magnetic recording and reproducing apparatus side, whereby the pocket portion 10 and the reel shaft insertion apertures 5 of the lower part 4 are opened.

A slider locking mechanism is provided between the slider 17 and the lower half 4 to hold the slider 17 in the locked condition at the front closing position and at the rear opening position. More specifically, as shown in Fig. 2, this slider locking mechanism is comprised of left and right slider lock members 18 which are formed on one portion of the lower part 4 so as to be vibrated in the up to lower direction and front and back

engaging apertures 19a and 19b bored through the slider 17 in correspondence with the slider lock members 18. Under the condition that engaging convex portions 18a formed on the tops of the slider lock members 18 are engaged with the rear engaging apertures 19b, the slider 17 is locked at the front closing position, while under the condition that the engaging convex portions 18a of the slider lock members 18 are engaged with the front engaging apertures 19a, the slider 17 is locked at the rear opening position. The slider 17 locked by the slider locking members 18 is released from its locked condition by a releasing member (not shown) provided at the magnetic recording and reproducing apparatus side.

Limiter pins 20 are protruded on the inner side surface of the upper part 3 in correspondence with the slider lock members 18, and the top surfaces of the limiter pins 20 are opposed to the inner surface sides of the top portions of the slider locking members 18 with a predetermined spacing. The limiter pins 20 restrict the amount in which the slider lock members 18 are vibrated with resiliency, or the limiter pins 20 can prevent the slider lock members 18 from being vibrated and deformed more than is necessary, thereby being prevented from being damaged.

In the conventional DAT tape cassette thus constructed, the slider 17 is locked only by the resiliency of the slider lock member 18 so that, because the slider 17 is opened and/or closed repeatedly or due to aging change, the engaging force of the slider lock member 18 is weakened, resulting in the locked condition of the slider 17 being loosened.

To remove this disadvantage, a magnetic tape cassette is proposed, in which a coil spring is additionally interposed between the upper part 3 and the top portion of the slider lock

member 18 and a lock holding force applied to the slider 17 by the slider lock member 18 is reinforced by the resilient force of this coil spring (see Japanese Patent Laid-Open Gazette No. 62-279573).

5                    However, in this prior art magnetic tape cassette, the slider locking coil spring is incorporated in addition to the ordinary arrangement, which increases the number of assembly parts. In addition, assembling the very small coil spring is very complicated, which results in a  
10 more complicated and expensive assembly process for the magnetic tape cassette.

OBJECTS AND SUMMARY OF THE INVENTION

15                    It is an object of the present invention to provide an improved magnetic tape cassette in which a slider can be positively locked at its closed position or at its opened position.

20                    According to the present invention there is provided a magnetic tape cassette having a cassette casing formed of upper and lower parts, reel hubs accommodated within said cassette casing and around which a magnetic tape is wound, a locking member for locking said reel hubs, reel shaft insertion apertures through which said reel hubs can be engaged, a slider for opening and closing said reel shaft insertion apertures, a slider lock member provided on  
25 the part through which said reel shaft insertion apertures are formed and for locking said slider at an opening position and at a closing position and limiter pins for preventing said slider lock member from being deformed more than is necessary, said magnetic tape cassette further comprising:  
30

35                    a hub lock spring having a first spring portion for spring-biasing said hub lock member in the direction in which it locks said reel hubs, said hub lock spring also having a second spring portion for spring-biasing said slider lock member in the direction in which it locks said slider.



Other objects and advantages of the present invention will be apparent in the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, in which like reference numerals are used to identify the same or similar parts in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view illustrating an example of a conventional magnetic tape cassette;

10 Fig. 2 is a perspective view of the conventional magnetic tape cassette of Fig. 1 and illustrating the condition that a front lid and a slider of the conventional magnetic tape cassette are opened;

15 Fig. 3 is a plan view of the conventional magnetic tape cassette of Fig. 1 and illustrating the inside portion of an upper part thereof;

Fig. 4 is a side view of the conventional magnetic tape cassette of Fig. 1 and illustrating one portion thereof in a cross-sectional fashion;

20 Fig. 5 is a plan view of an embodiment of a magnetic tape cassette according to the present invention and illustrating the inside portion of a main portion of an upper part thereof; \_\_\_\_\_



Fig. 6 is a cross-sectional side view of a main portion of the magnetic tape cassette of Fig. 5;

Fig. 7 is a fragmentary plan view of a main portion of the present invention and illustrating the condition that a hub lock spring is mounted;

Fig. 8A is a cross-sectional view taken through the line A - A in Fig. 7;

Fig. 8B is a cross-sectional view taken through the line B - B in Fig. 7; and

Figs. 9A and 9B are cross-sectional views corresponding to Figs. 8A and 8B, respectively.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

An embodiment of the magnetic tape cassette according to the present invention will hereinafter be described with reference to Fig. 5 to Figs. 9A and 9B, wherein like parts corresponding to those of the example of the conventional magnetic tape cassette shown in Figs. 1 to 4 are marked with the same references and therefore need not be described in detail. In this embodiment, only a main portion will be described, and the most specific feature of the present invention lies in that a hub lock spring for spring-biasing a hub lock member in the locking direction ~~is~~ <sup>also serves</sup> ~~served also~~ as an auxiliary spring for a slider lock member.

More specifically, in this embodiment, the hub lock spring is formed of a pair of left and right hub lock springs 24. In the two hub lock springs 24, one end portion sides 24a thereof are formed as hub lock member spring-biasing portions which are slidably engaged with the hub lock member 13 to push the hub lock member 13. Thus, the hub lock springs 24 are constructed substantially as torsion springs. On the other end portions of the hub lock springs 24, there are provided coil spring portions



24b in the direction perpendicular to axial direction and, the two hub lock springs 24 are shaped symmetrical with respect to the up to down direction.

When the hub lock member 13 is assembled to the upper part 3, the two hub lock springs 24 are assembled to the magnetic tape cassette as follows. The coil spring portions 24b are ~~engaged~~<sup>received</sup> ~~into limiter pins 20~~<sup>on limiter pins 20 provided</sup> planted on the inner surface of the upper part 3 and the intermediate portions of the hub lock springs 24 are engaged with engagement supporting portions 25 protruded on the inner surface of the upper part 3, whereby the two hub lock springs 24 are provided symmetrically with respect to the center of the hub lock member 13 on the inner surface of the upper part 3. Then, one end portions 24a of the springs 24 are brought in

contact with and engaged with contact engaging portions 13d of the hub lock member 13 on its side portion, thus the two hub lock springs 24 being assembled to the upper part 3.

In this arrangement, the limiter pins 20 and the coil spring portions 24b of the two hub lock springs 24 are each shaped as frusta and, a plurality of, for example, two engagement supporting portions 25 for engagingly supporting the two hub lock springs 24 are each protruded on the inner surface of the upper part 3 at a predetermined spacing. In this embodiment, engaging surfaces 25a of the two engagement supporting portions 25 are formed to have configurations of L letter cross section in their opposing directions and vertical engagement surface portions 25a1 of the engaging surfaces 25a are coincident with a straight line a shown by a one-dot chain line in Fig. 7. Accordingly, when the hub lock spring 24 is engaged with the engagement supporting portions 25, the hub lock spring 24 is deformed by an amount of its diameter between the engaging surfaces 25a so that the hub



lock spring 24 is urged against the vertical engagement surface portions 25a1 and secured thereto by a force of restitution to become straight under the condition that it is in contact with horizontal engagement surface portions 25a2.

Under the finished state of the assembly-process in which the upper part 3 and the lower part 4 are fastened together, the top of the coil spring portion 24b of the hub lock spring 24 is brought in contact with the inner surface of the top portion of the slider lock member 18. In that case, the coil spring portion 24b of the hub lock spring 24 is opposed at its tapered portion to the lower part 4 side and therefore comes in contact with the slider lock member 18 at its predetermined position positively.

Thus, the resilient force of the hub lock spring 24 can reinforce

the engaging force of the slider lock member 18 relative to the slider 17.

Under this condition, the hub lock spring 24 is secured at its intermediate portion to the upper part 3 by the engagement supporting portion 25 so that, even when the one end portion 24 of the hub lock spring 24 is deformed with resiliency by the lock releasing operation of the hub lock member 13, the coil spring portion 24b can be prevented from being affected at all.

Accordingly, the coil spring portion 24b can be prevented from being displaced from the predetermined portion of the slider lock member 18 and the spring force of the coil spring portion can be prevented from being changed. Further, the one end portion 24a of the hub lock spring 24 can positively spring-bias the hub lock member 13 regardless of the contraction and expansion of the coil spring portion 24b, i.e. the pushing operation against the slider lock member 18.

Further, since the hub lock springs 24 are separately

provided with respect to the slider lock member 18, the spring-biasing force is applied to the slider lock member 18 in a well-balanced condition, thus the two reel hubs 5 being locked or being released from their locked states smoothly and positively.

As described above, according to this embodiment, since the symmetrical hub lock springs 24 for spring-biasing the hub lock member 13 in the locking direction are provided with the coil spring portions 24b which reinforce the lock holding force of the slider lock member 18, the increase of the assembly parts can be suppressed and the assembly process can be simplified as compared with the conventional tape cassette in which the slider lock reinforcing spring is independently assembled.

Further, since the hub lock spring 24 is not affected by its

one end portion 24b and acts as the spring-biasing means independently of its one end portion 24a which spring-biases the hub lock member 13, the coil spring portion 24b can positively reinforce the lock holding force of the slider lock member 18.

Accordingly, even when the slider lock member 18 itself is

lowered in resiliency by repeatedly opening and closing the

slider 17 or due to aging change or even when the slider lock

member 18 is deformed by heat while being kept in a high

temperature under the condition that the slider 17 is opened or

that the slider 17 is not closed fully, the slider lock member 18

can positively hold the slider 17 in the locked condition.

Further, in this embodiment, since the limiter pin 20 and

the coil spring portion 24b of the hub lock spring 24 are formed

as the frusta, the coil spring portion 24b can be smoothly

inserted into the limiter pin 20, which simplifies the assembly

process and increases efficiency in assembly work.

Furthermore, various changes and modifications of the

present invention may be possible. By way of example, the engagement supporting portion 25 for engagingly supporting the hub lock spring 24 may be modified as follows. The engaging surface thereof may be shaped as U-letter configuration in cross section as shown in Fig. 9. That is, an engaging concave portion 25b along the vertical engaging surface portion 25a1 is formed on the horizontal engaging surface portion 25a2 of the engaging surface 25a which is formed similarly to the engaging surface shown in Figs. 8A and 8B, and the hub lock spring 24 may be engaged with and supported by this engaging concave portion 25b. By forming the engagement supporting portion 25, it is possible to support and secure the hub lock spring 24 more positively.

In addition, the layout of the respective members may be reversed in the upper and lower parts, and the configurations of the respective members may be changed, if necessary.

As set out above, according to the present invention, since one end portions of the pair of hub lock springs for spring-biasing the hub lock member are employed as the spring-biasing portions which are slidably engaged with the hub lock member, the coil spring portions are formed on the other end portions of the hub lock springs so as to be inserted into the limiter pins to oppose the slider lock member and the hub lock springs are engaged with and secured to the cassette casing at their intermediate portions, the hub lock member spring-biasing portions formed at one end portions and the coil spring portions are prevented from interfering with each other and act as the spring-biasing members independently, whereby the hub lock member can lock the reel hubs positively and the lock holding force of the slider lock member can be reinforced by the coil spring portions. Thus, the slider can be positively locked when it is

opened and closed.

Furthermore, since the coil spring portions for reinforcing the lock holding force of the slider lock member are formed on the hub lock springs, the increase of assembly parts can be suppressed and the assembly process can be prevented from becoming complicated as compared with the conventional magnetic tape cassette in which the slider locking coil spring is additionally assembled. Therefore, it is possible to realize the magnetic tape cassette in which the slider can be positively locked while the magnetic tape cassette is kept inexpensive from a money standpoint.

Having described a preferred embodiment of the invention with reference to the accompanying drawings, it is to be understood that the invention is not limited to that precise embodiment and that various changes and modifications could be effected by one skilled in the art without departing from the spirit or scope of the novel concepts of the invention as defined in the appended claims.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A magnetic tape cassette having a cassette casing formed of upper and lower parts, reel hubs accommodated within said cassette casing and around which a magnetic tape is wound, a locking member for locking said reel hubs, reel shaft insertion apertures through which said reel hubs can be engaged, a slider for opening and closing said reel shaft insertion apertures, a slider lock member provided on the part through which said reel shaft insertion apertures are formed and for locking said slider at an opening position and at a closing position and limiter pins for preventing said slider lock member from being deformed more than is necessary, said magnetic tape cassette further comprising:

a hub lock spring having a first spring portion for spring-biasing said hub lock member in the direction in which it locks said reel hubs, said hub lock spring also having a second spring portion for spring-biasing said slider lock member in the direction in which it locks said slider.

2. A magnetic tape cassette according to claim 1, wherein said hub lock spring is one of a pair of hub lock springs engaged at one end to said hub lock member, and wherein said second spring portions are coil spring portions formed on the other end of said hub lock springs, said coil spring portions being received on said limiter pins within the cassette casing.

3. A magnetic tape cassette according to claim 2, wherein each hub lock spring is engaged with and secured by an intermediate portion to either one of said upper and lower parts while being deformed resiliently.

4. A magnetic tape cassette according to claim 2, wherein said limiter pins are formed on an inner surface of



said part opposing a top of said slider lock member and are shaped as frusta which are tapered towards the tops thereof.

5. A magnetic tape cassette substantially as herein  
5 described with reference to and as illustrated in Figures 5 to 9 of the accompanying drawings.

Dated this 19th day of April, 1993.

SONY CORPORATION

By its Patent Attorneys:

10

GRIFFITH HACK & CO.

Fellows Institute of Patent Attorneys of Australia



FIG. 1

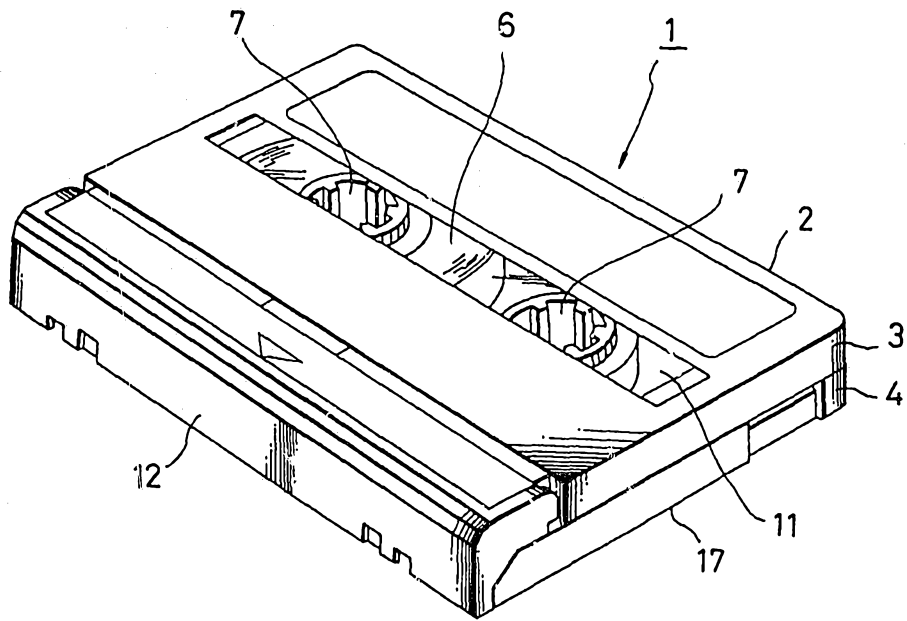


FIG. 2

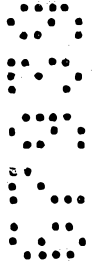
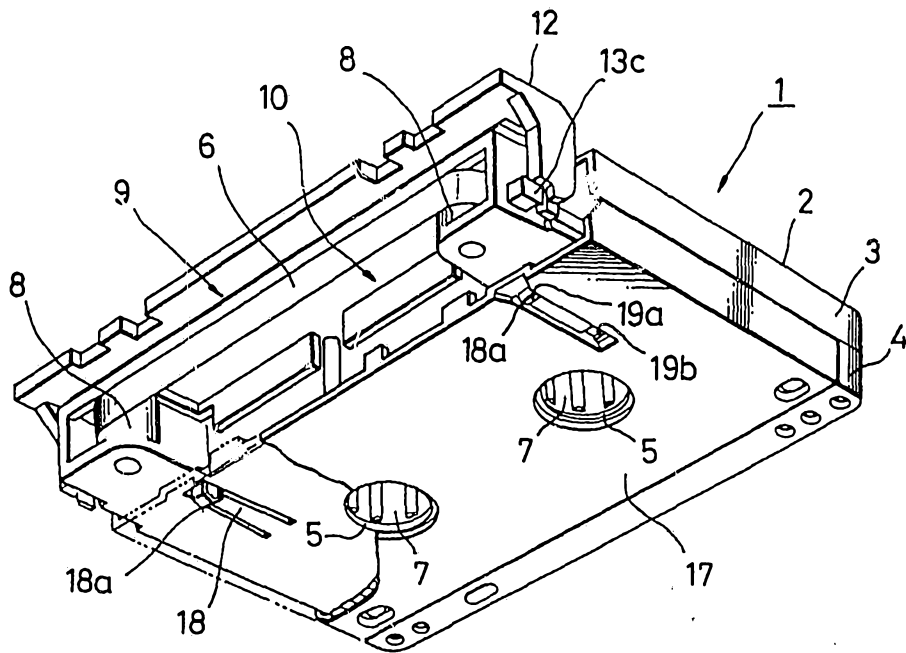


FIG. 3

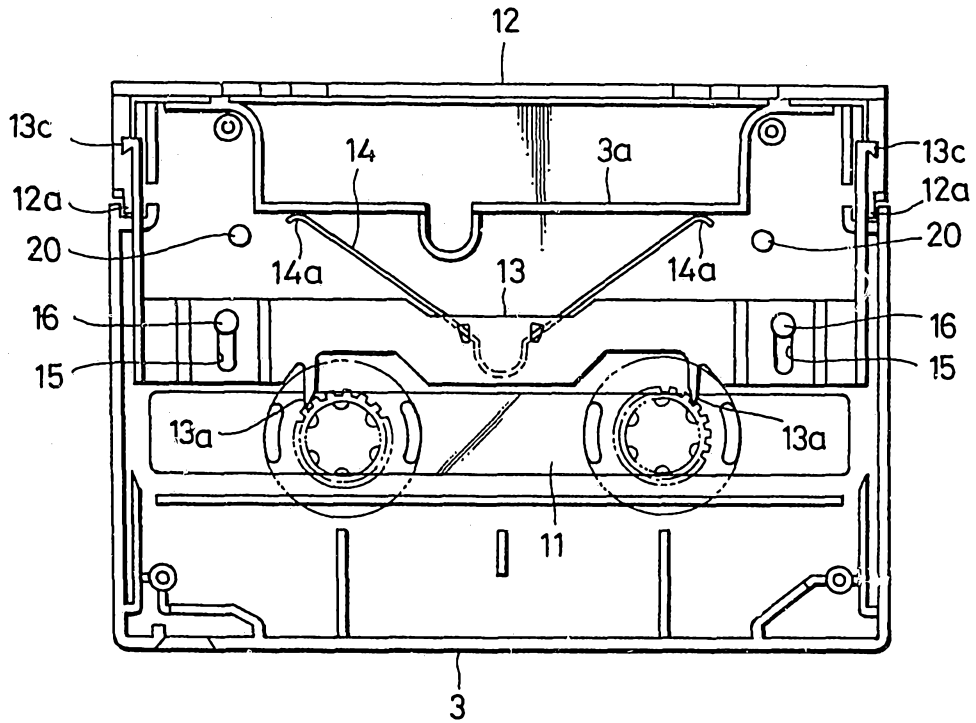
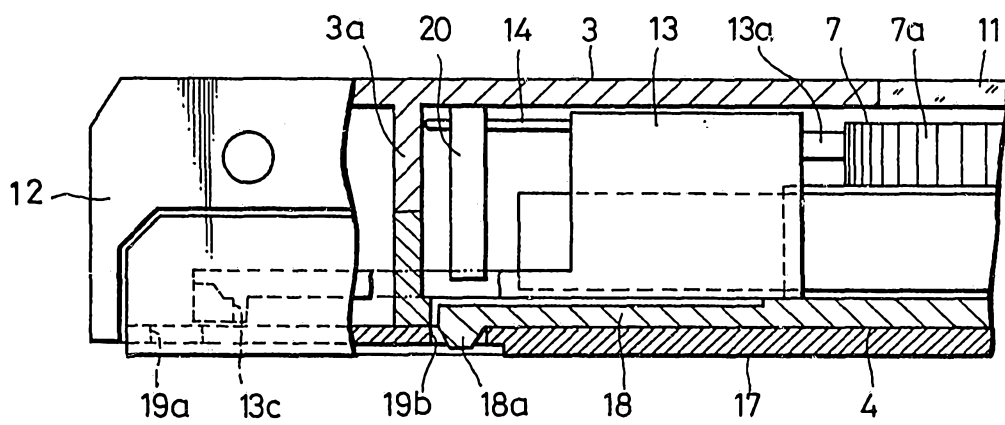
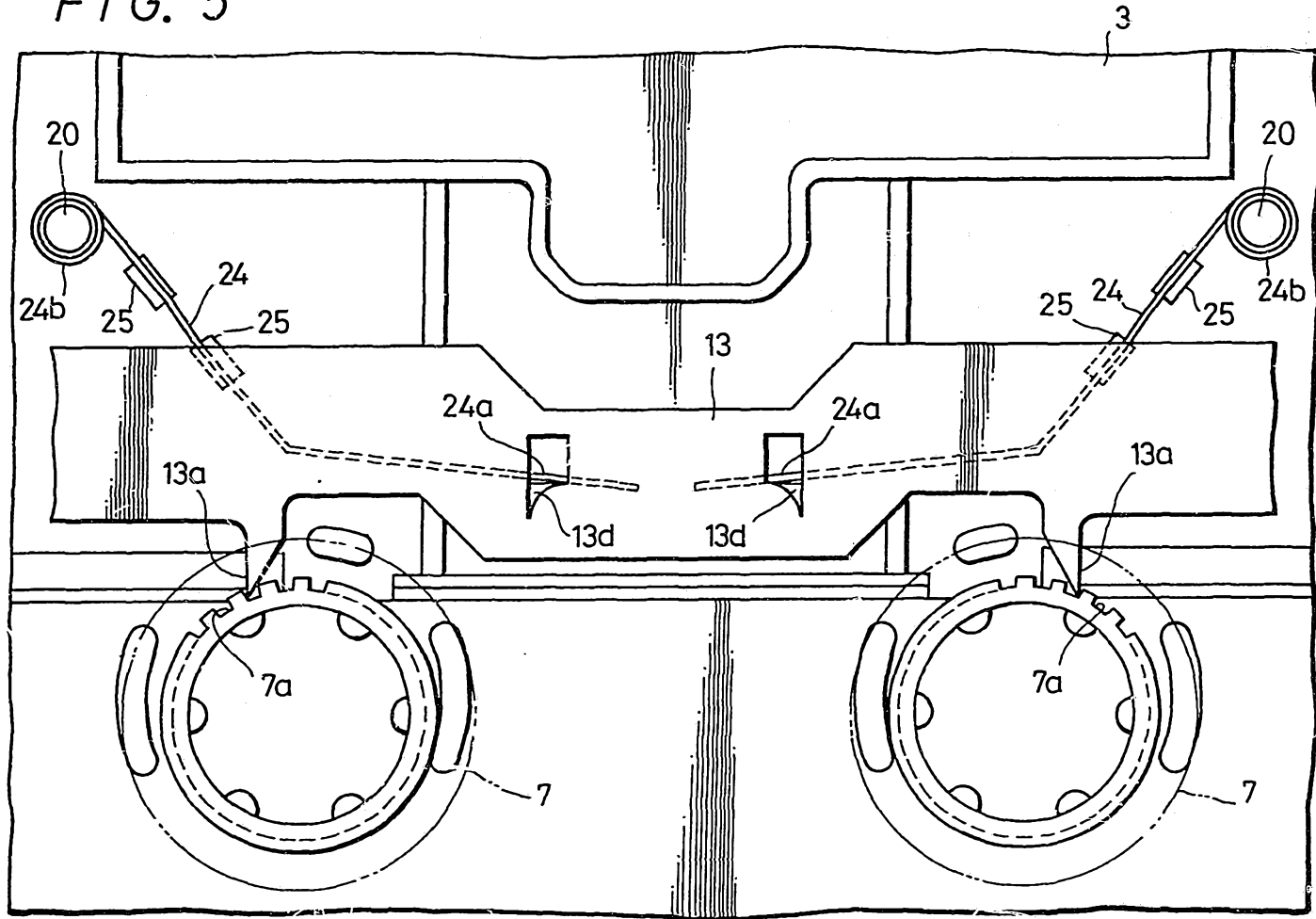


FIG. 4



11 12 90 67939

FIG. 5



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11 12 90 67939

FIG. 6

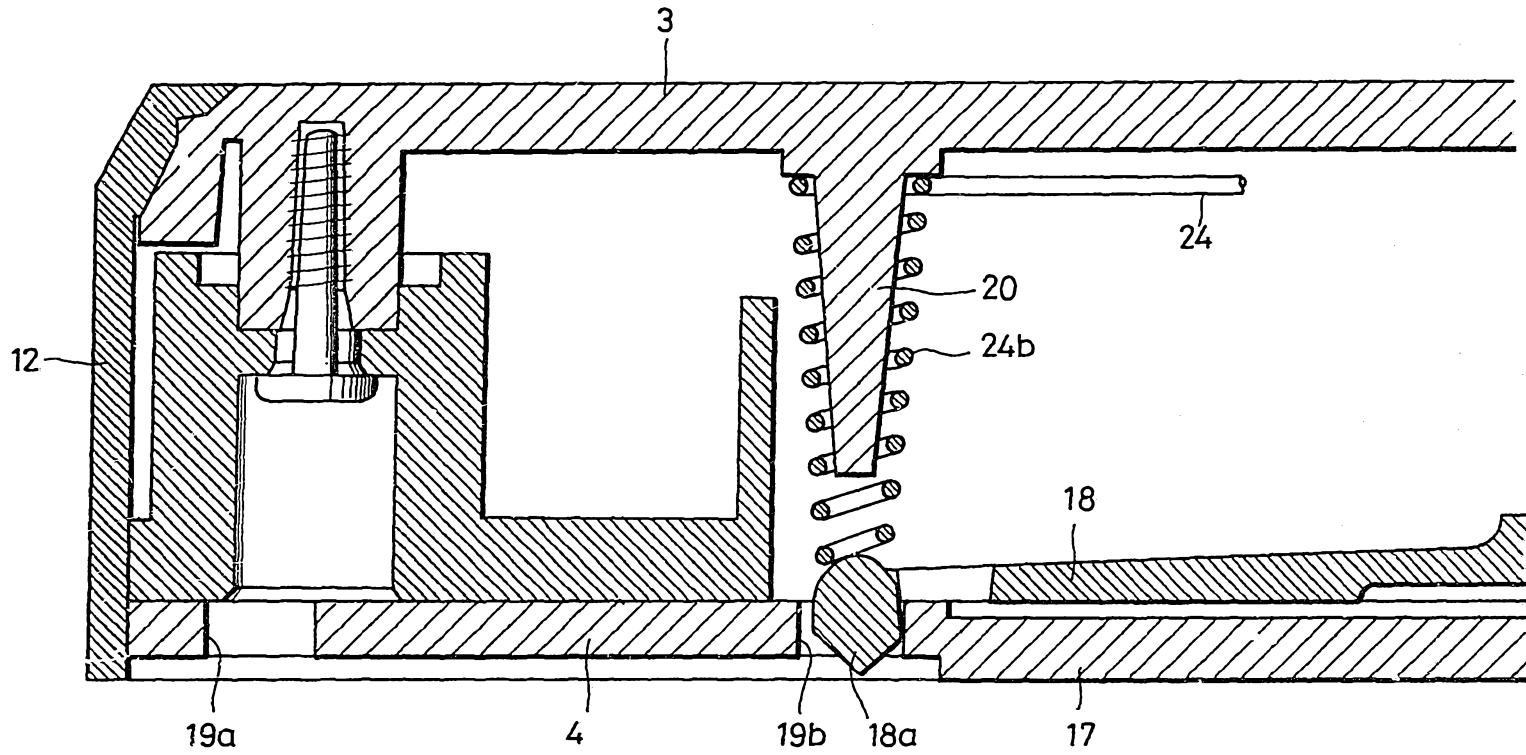


FIG. 7

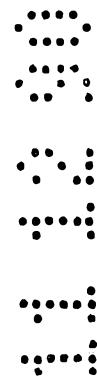
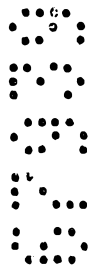
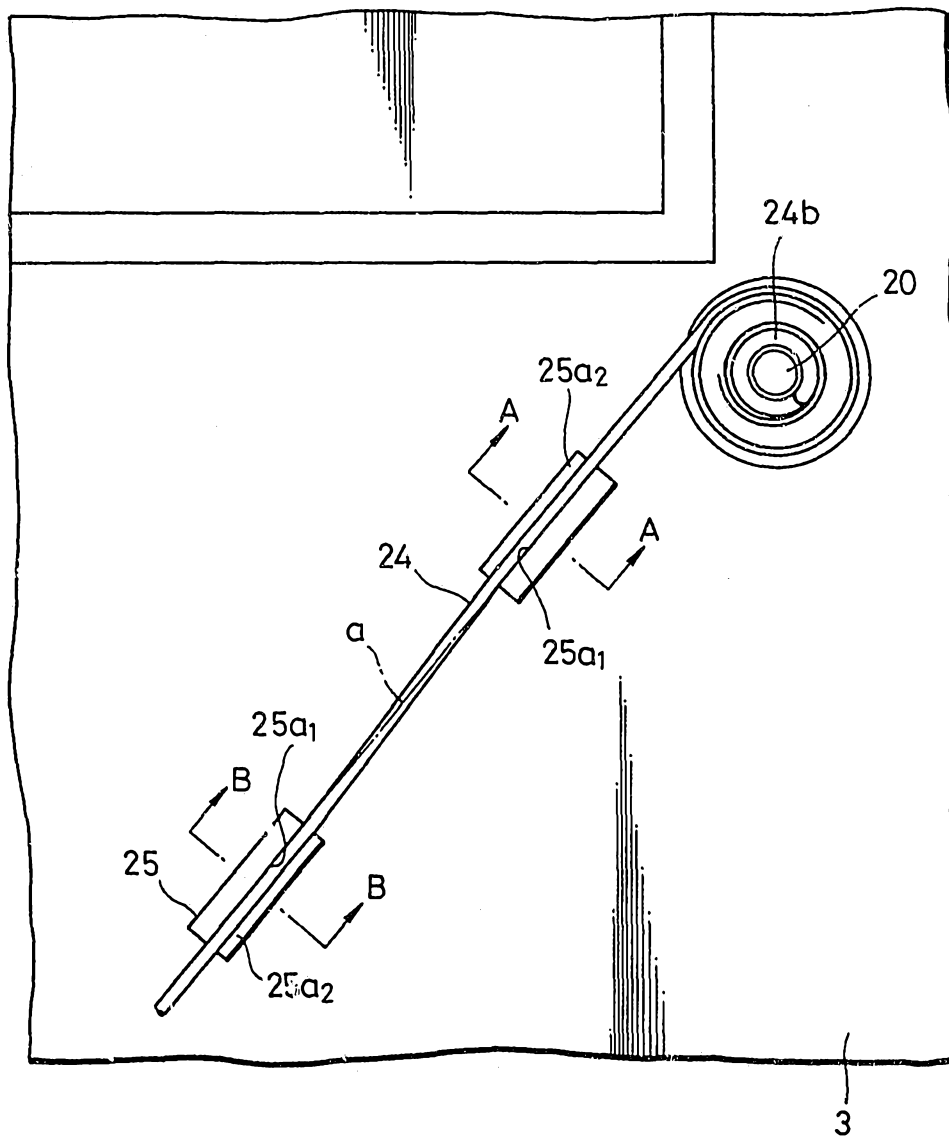


FIG. 8A

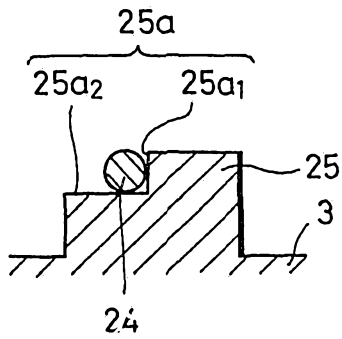


FIG. 8B

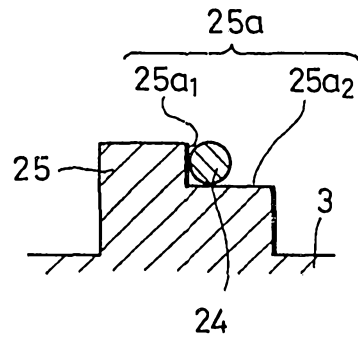


FIG. 9A

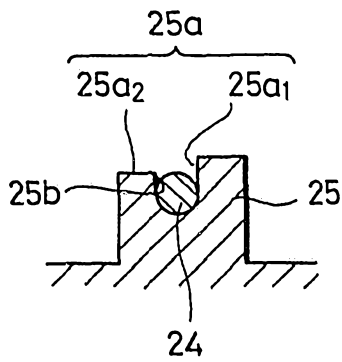


FIG. 9B

