Description

The invention relates to a magnetic tape cassette. The invention has particular though not exclusive application to a tape protective closure for openably closing an opening of a cassette casing of a magnetic tape cassette, such as a pulse-code modulated (PCM) audio cassette, which has means for normally biasing the closure to a closed position.

FR-A-2557348 (Horikawa et al) discloses a cassette casing for a magnetic tape cassette with an openable and closable pivotal closure lid at its front portion and an openable and closable sliding shutter member at its lower surface. When the magnetic tape is not in use, the sliding shutter member covers the underside of the magnetic tape cassette to cover the reel shaft insertion apertures, and a cut-out for receiving a tape loading mechanism of a recording and/or reproducing apparatus. The pivotal closure lid and the sliding shutter member are coupled while in the closed position. The sliding shutter member is biased toward the closed position by means of a coil spring. This is reflected in the reamble of claim 1.

A drawback is encountered in this mechanism due to the presence of the coil spring biasing the sliding shutter member toward the closed position. Specifically, in order to accommodate the coil spring, some clearance must be provided between the lower surface of the cassette casing and the upper surface of the sliding shutter member. This adversely affects how thin the magnetic tape cassette can be made.

In addition, in order to anchor the front end of the coil spring, a spring anchor column must be formed in the lower section of the cassette casing, and, in order to anchor the rear end, a spring anchor member must be formed in the sliding shutter member. The front and rear ends of the coil spring must also be hooked onto the spring anchor column and the spring anchor member during assembly. This makes assembly rather troublesome and thus degrades the manufacturing productivity of the magnetic tape cassette.

Patent Abstracts of Japan Vol. 9 No. 304 of Japanese Patent Application 60/136079 discloses a tape cassette in which a sliding closure member is biased to a closed position by a torsion spring mounted in the cassette and having a projecting spring and bearing against a projection from the sliding closure member.

According to one aspect of the invention there is provided a magnetic tape cassette comprising:
a cassette casing with a front end opening and an underside cut-out in the front edge of a floor thereof, and a shield wall extending along the rear edge of the cut-out and defining an essentially enclosed internal space which receives a tape reel onto which a magentic tape is wound, and a tape run path exposed frontward and downward through the opening and the cut-out; and
a sliding closure member slidingly attached to the bottom of the cassette casing and movable between a first position in which the sliding closure member closes the cut-out, and a second position in which the sliding closure member is away from the first position to open the cut-out;
characterised in that a torsion spring has a first section secured to the sliding closure member in front of the shield wall, and a second section abutting against the front surface of the shield wall thereby constantly to exert a frontward biasing force on the sliding closure member.

Such a magnetic tape cassette can have a sliding shutter member with an associated biasing means which requires minimal space and thus allows the magnetic tape cassette to be thin but convenient to assemble.

Preferably the first section of the torsion spring is in the form of a coil generating torsional force and is wound around a pin near the front edge of the sliding closure member. The pin may be sufficiently tall to position its top near the lower surface of a ceiling of the cassette casing so as to abut thereagainst when the sliding closure member is slightly deformed downward.

In accordance with the preferred embodiment, the pin is located approximately in the lateral centre of the front edge of the closure member and in front of the shield wall and has a top located immediately beneath the lower surface of a ceiling of the cassette casing so as to abut thereagainst in order to prevent significant deformation of the closure member.

Preferably, the torsion spring further comprises another bar-like section abutting a projection extending from the closure member near the pin. The pin and projection are advantageously so located as to be positioned in front of the shield wall when the closure member is in the second position.

Advantageously the magnetic tape cassette further comprises a pivotal closure lid for openably closing the front end opening of the cassette casing. The pivotal closure lid is preferably co-operative with the sliding closure member for movement between a first closed position and a second open position as the sliding closure member moves between the first and second positions. The magnetic tape cassette may also have a locking means for releasably locking the sliding closure member at the first and second positions.

The invention is diagrammatically illustrated by way of example with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of one embodiment of a magnetic tape cassette according to the invention, in which a pivotal closure lid and a sliding closure member are shown in their respective closed positions;

Figure 2 is a perspective view of the magnetic tape cassette of Figure 1, viewed from the lower side of the cassette, in which the pivotal closure lid and the sliding closure member are shown in their respective open positions during use of the cassette;

Figure 3 is an exploded perspective view of the magnetic tape cassette of Figure 1;

Figure 4 is a partial plan view of the preferred embodiment of the magnetic tape cassette, showing a sliding closure member biasing spring in the closed position of the sliding closure member;

Figure 5 is a front elevation of the biasing spring and mounting structure therefor;

Figure 6 is a partial plan view similar to Figure 4, but showing the biasing spring in the open position of the sliding closure member; and

Figure 7 is an explanatory perspective view of the preferred embodiment of the magnetic tape cassette showing how the cassette would normally be gripped by a user.

Referring to the drawings and firstly to Figures 1 to 3, a magnetic tape cassette has a casing 10 including an upper section 11 and a lower section 12 which are connected by threaded bolts (not shown) in a per se well-known manner to form a single unit. A transparent window plate 11a is built into the upper surface of the upper section 2. A pair of reel hubs 13 incorporated into the cassette casing 10 rotatably engage a pair of reel shaft insertion apertures 12a. The apertures 12a are formed in the lower section 12 at predetermined positions which establish a suitable spacing between the reel hubs 13. A magnetic tape 14 is wound around the reel hubs 13.

The cassette casing 10 has a front end opening through which the magnetic tape 14 is exposed to the outside. In addition, the lower section 12 of the cassette casing 10 is formed with a cut-out portion 12b at its front edge. The cut-out 12b adjoins the front end opening. The cut-out portion 12b of the lower section 12 extends over a predetermined width so as to expose the rear surface of the magnetic tape 14 extending thereacross. During recording or reproduction, loading posts constituting part of a tape loading mechanism enter the cut-out portion 12b and draw out a section of the magnetic tape 14. Along the rear edge of the cut-out portion 12b, a vertical shield wall 16 extends upwards from the lower section 12. The shield wall 16 mates with a corresponding shield wall (not shown) extending down from the lower surface of the upper section 11. Tape guide columns 15 are formed on both sides of the cut-out 12b. The tape guide columns 15 are generally cylindrical with rounded tape contact surfaces. The magnetic tape 14 is stretched between and around the tape guide columns 15 so as to follow a predetermined tape run or path along the front edge o the tape cassette and across the front opening over the rotary head. Positioning holes 15a are formed through the bottom of the lower section 12 directly under each tape guide column 15. The shield wall 16 and the tape guide columns 15 co-operate to define a tape path with enough clearance to accommodate a tape loading mechanism, such as the loading post of a recording and/or reproducing apparatus, e.g. PCM recorder.

A pivotal closure lid 17 is rotatably or pivotally attached at the right and left side walls of the cassette casing 10 near the front end of the tape cassette. When the pivotal closure lid 17 is pivoted away from the front surface of the tape cassette, the magnetic tape 6 is exposed through the front end opening. A sliding closure member 24 slidably engages the lower section 12 and openably covers the cut-out portion 12b.

While the tape cassette is not in use, the pivotal closure lid 17 opposes the front end opening of the cassette casing 10 to cover the front end opening. At the same time, the sliding closure member 24 is in its forwardly-shifted position, in which it covers the cut-out portion 12b of the lower section 12 and thus prevents the tape loading mechanism of the recording and/or reproducing apparatus from reaching into the tape cassette. The pivotal closure lid 17 can pivot away from the front surface of the magnetic tape cassette to expose the magnetic tape 14, and the sliding closure member 24 can move to the rear to expose the cut-out portion 12b so that the tape loading mechanism can reach into the cut-out portion 12b to draw some of the magnetic tape 14 out of the cassette casing 10 for loading onto a rotary drum (not shown) for recording or playback. Thereafter, when the recording or playback is over and the magnetic tape cassette is returned to the stand-by state, the pivotal closure lid 17 and the sliding closure member 24 are returned to the aforementioned closed positions. Throughout the rest of this document, the positions of the pivotal closure lid 17 and the sliding closure 24 in which they cover the front opening and the cut-out portion 12b respectively will be referred to as "stand-by position" or "closed position" and the position of the lid 17 and the closure 24 in which they expose the front opening and the cut-out portion 12b will be referred to as "operating position" or "open position".

As shown in Figures 1 to 3, the pivotal closure lid 17 is elongate along the major dimension of the front end opening and has arms 17b projecting from its opposite ends which pivotably attach the pivotal closure lid 17 to the front of the cassette casing 10 by means of pivot shafts 18. The pivot shafts 18 about which the pivotal closure lid 17 pivots are approximately centred on the inner surfaces of the respective arms 17b. Thus, the pivotal closure lid 17 can be pivoted selectively to cover and expose the front opening of the cassette casing 10. In order to mount the pivotal closure lid 17 pivotably, the front ends of the left and right side walls are stepped laterally inwards by the thickness of the arms 17b of the pivotal closure lid 17 to form support walls 12c. The tops of the support walls 12c are formed with indentations 190. When the upper section 11 and the lower section 12 are assembled, matching support walls 11b in the upper section 11 abut the support walls 12c edge-to-edge. The indentations 19 then form apertures allowing pivotal mounting of the pivot shafts 18 (only one of which is visible in Figure 3) of the closure lid 17.

The closure lid 17 also comprises a plate 17a which is elongate in the direction of the opening in the cassette casing 10 and covers the entire length of the front of the cassette casing 10. When the pivotal closure lid 17 is rotated to the closed position to cover the front of the cassette casing 10, the arms 17b lie flush with the contours of the upper section 11 as best shown in Figures 1 and 2 since the arms 17b are received within the step defined by the support walls 12c and 11b. The pivotal closure lid 17 is held in this position by the closure member 24 which is held in its stand-by position under the arms 17b as shown in Figure 1.

Cut-away portions 17c are formed by cutting small grooves into the lower edge of the plate 17a toward the left and right extremes of the cut-out portion 12b of the lower section 12.

The sliding closure member 24 has a flattened U-shaped configuration and is so mounted on the lower section 12 of the cassette casing 10 that it can slide back and forth parallel to the lower surface of the lower cassette section 12. Apertures 24c, respectively corresponding to the reel shaft insertion apertures 12a, are formed in the sliding closure member 24 in such positions that after the sliding closure member 24 slides all the way backwards to expose the cut-out portion 12b, the apertures 24c are respectively aligned with the reel shaft insertion apertures 12a.

The sliding closure 24, as shown in Figure 3 comprises a flat plate 24a which lies parallel to the lower surface of the lower section 12 and side plates 24b along the left and right sides of the flat plate 24a which lie parallel to the outer surfaces of the left and right side walls of the lower section 12. Flanges 25 are formed by bending the upper ends of the side plates 24b inwardly. The flanges 25 are restrained vertically but not horizontally between the side walls of the upper and lower sections 11 and 12 after the cassette casing 10 is assembled.

Contact pieces 24d extend upwards perpendicularly from the flat plate 24a at the front of the plate at positions which correspond to the cut-away portions 17c of the closure lid 17. The contact pieces 24d enable the recording and/or reproducing apparatus to slide the closure 24 to the rear in preparation for opening the cassette casing 10.

Stepped rests 12e extend along the upper edges of the left and right side walls of the lower section 12 and parallel thereto. The depth of the stepped rests 12e is not as great as the thickness of the arms 17b of the pivotal closure lid 17. Guide grooves 26 extend along each of the side walls of the lower section 12 parallel to each other and to the stepped rests 12e. Similarly to the rests 12e, the guide grooves 26 are not as deep as the arms 17b of the closure lid 17 are thick. The stepped rests 12e receive the flanges 25 of the sliding closure 24. Also, the guide grooves 26 slidably receive inwardly depressed indentations 24e formed in the side plates 24b of the sliding closure 24. Sliding engagement between the rests 12e and the flange 25 and between the guide grooves 26 and the indentations 24e guides sliding movement of the sliding closure 24 with respect to the cut-out portion 12b along the side walls of the lower section.

A knurled recess 11c is formed near the rearward end of each of the right and left side walls to facilitate a secure grip when the magnetic tape cassette is held in the hand. V-shaped concave supports 11d are formed near the centre of the left and right side walls. When the tape cassette is loaded in the recording and reproducing apparatus, the concave supports 11d are engaged by support studs (not shown) from both the right and the left.

As shown in Figure 3, a reel brake member 20 comprises a slide guide plate 20a which is elongate in a direction parallel to the front opening of the casing and to the pivotal closure lid 17 and lies along the inner surface of the upper section 11. The member 20 also comprises L-shaped arms 23 which respectively extend perpendicularly downward from either end of the slide guide plate 20a and then forward. Brake pins 22 corresponding to the reel hubs 13 respectively extend rearward from the slide guide plate 20a. Brake wheels are formed on the outer peripheral portions of the reel hubs 13 opposite the brake pins 22.

A spring-engaging stud 20b is provided at the centre of the slide guide plate 20a, and operating tabs 23a are formed on the extreme ends of the

arms 23 respectively. The centre coil 21a of a torsion spring 21 used to bias the reel brake member 20 towards its braking position is fitted onto the spring-engaging stud 20b. The free ends 21b of the spring 21 press against the rear of the shield wall of the upper section 11 so that the brake pins 22 normally engage the brake wheels of the reel hubs 13, whereby the reel hubs 13 are prevented from rotating.

In order to receive the tabs 23a, rectangular apertures 12d are formed near the front, lower corners of the support walls 19.

The reel brake member 20 is so disposed within the cassette casing 10 that the ends of the tabs 23a protrude through the insertion apertures 12d of the lower section 12 outside of the support walls 12c to a predetermined extent. When the pivotal closure lid 17 is pivoted upwards, the protruding tabs 23a are engaged by the ends of the arms 17b of the closure lid 17, and the reel brake member 20 is pulled forward against the biasing force of the spring 21. The brake pins 22 are thus disengaged from the brake wheels of the reel hubs 13, allowing the reel hubs 13 to rotate. It should be noted that the closure lid 17 is driven upwards by actuating pins (not shown) of the recording/playback system when the cassette casing 10 is fully deployed in the operating position. The actuating pins provide the force needed to overcome the force of the torsion spring 21.

In order to bias the sliding closure 24 toward the forward closed position, there is provided a torsion spring 28. The torsion spring 28 has a coil section 37 wound around a spring support pin 27 extending from the upper surface of the sliding closure member 24. The torsion spring 28 also has a rod-shaped extension 38a abutting against the front surface of the shield wall 16 of the lower section 12.

The torsion spring 28 also has another rod-shaped extension 38b abutting against a spring engaging block 39 fixed to the upper surface of the sliding closure member 24.

As shown in Figure 5, the height of the spring support pin 27 approximately matches that of but is slightly shorter than the overall internal height between the lower surface of the ceiling of the upper section 11 and the upper surface of the sliding closure member. The free end of the rod-shaped extension 38a is bent downwards to provide a wider contact area with the front surface of the shield wall 16.

The torsion spring 28 exerts its spring force in the unwinding direction of the coil section 37 and thereby biases the rod-shaped extensions 38a and 38b away from each other. In the position shown in Figure 4, where the pivotal closure member 24 is in the forward, closed position, the spring force of the torsion spring 28 is at the level initially set when the magnetic tape cassette is assembled. On the other hand, as the sliding closure member 24 is shifted to the rearward, open position, the rod-shaped extension 38b approaches the rod-shaped extension 38a and accumulates an increasing torsional spring force. This accumulated spring force serves as a return force biasing the sliding closure member 24 toward the closed position.

Locking levers 29 with rounded locking heads 31 are integrally formed with the lower section 12. Each of the locking levers 29 is defined by an essentially U-shaped slit 29a in the lower section 12. The locking locking heads 31 are selectively engageable with pairs of openings 32 and 33 in order to lock the sliding closure member 24 in the closed or open position. The openings 32 are aligned substantially parallel to the longitudinal axis of the magnetic tape cassette as are the openings 33. Grooves 24f in the lower surface of the sliding closure member 24 join each pair of openings 32 and 33. The peripheral edges of the openings 32 and 33 are tapered upwardly so as to facilitate unlocking of the locking head 31 when it is actuated.

The locking levers 29 also have upward extensions 34 near their free ends. The upward extension 34 is designed to engage the lower surface of the upper section after deformation of the locking lever 29 to a given extent and thereby serve as a stopper.

Actuation of the sliding closure member 24 between the closed position and the open position, and as the locking and unlocking of the sliding closure member in the closed and open positions, has been disclosed in GB-A-2 155 905, EP-A-0 160 822. The discussion of the structure and actuation of the sliding closure member 24 is hereby incorporated by reference for the sake of disclosure. Also, prior descriptions of various magnetic tape cassette structures, such as is disclosed in US-A-4 572 461, are hereby incorporated by reference for the sake of disclosure.

Little or no space is required to accommodate the means providing the spring force biasing the sliding closure member. In addition, since the torsion spring is always hidden by the sliding closure member, the appearance of the underside of the magnetic tape cassette, especially in the sliding closure member open position, can be improved.

Furthermore, the spring support pin extending from the sliding closure member serves to prevent the sliding closure member from bending even when the magnetic tape cassette is held in a manner shown in Figure 7. When the magnetic tape cassette is gripped in the manner shown in Figure 7, the top fo the spring support pin 27 abuts against the lower surface of the upper section 11 to

prevent substantial deformation of the sliding closure member 24. This prevents the sliding closure member from being deformed.

Employing a torsion spring as the bias spring for the sliding closure member can simplify fabrication and assembly of the magnetic tape cassette. In particular, fabrication of the sliding closure member is simplified in that a sliding core which has heretofore been required to form an under-cut used to anchor one end of the coil spring is no longer unnecessary.

Claims

1. A magnetic tape cassette comprising:
a cassette casing (10) with a front end opening and an underside cut-out (12b) in the front edge of a floor thereof, and a shield wall (16) extending along the rear edge of the cut-out (12b) and defining an essentially enclosed internal space which receives a tape reel (13) onto which a magnetic tape (14) is wound, and a tape run path exposed frontward and downward through the opening and the cut-out; and
a sliding closure member (24) slidingly attached to the bottom of the cassette casing (10) and movable between a first position in which the sliding closure member (24) closes the cut-out (12b), and a second position in which the sliding closure member (24) is away from the first position to open the cut-out (12b);
characterised in that a torsion spring (28) has a first section (37) secured to the sliding closure member (24) in front of the shield wall (16), and a second section (38a) abutting against the front surface of the shield wall (16) thereby constantly to exert a frontward biasing force on the sliding closure member (14).

2. A magnetic tape cassette according to claim 1, wherein the first section (37) of the torsion spring (28) is in the form of a coil generating torsional force and wound around a pin (27) near the front edge of the sliding closure member (24).

3. A magnetic tape cassette according to claim 2, wherein the pin (27) is sufficiently tall to position its top near the lower surface of a ceiling of the cassette casing (10) so as to abut thereagainst when the sliding closure member (24) is slightly deformed downward.

4. A magnetic tape cassette according to claim 3, which further comprises a pivotal closure lid (17) openably to close the front end opening of the cassette casing (10).

5. A magnetic tape cassette according to claim 4, wherein the pivotal closure lid (17) is co-operative with the sliding closure member (24) for movement between a first closed position and a second open position as the sliding closure member (24) moves between the first and second positions.

6. A magnetic tape cassette according to claim 3, which further comprises a locking means (29, 31, 32, 33) releasably to lock the sliding closure member (24) at the first and second positions.

Revendications

1. Cassette à bande magnétique comportant:
un boîtier (10) de cassette présentant une ouverture à l'extrémité avant et, sur sa face inférieure, une découpe (12b) sur le bord avant de son plancher, ainsi qu'une paroi de protection (16) s'étendant le long du bord arrière de la découpe (12b) et définissnt un espace intérieur, essentiellement clos, qui reçoit une bobine de bande (13) sur laquelle est enroulée une bande magnétique (14), ainsi qu'un chemin de passage de la bande dégagé de l'avant et de l'arrière par l'ouverture et par la découpe; et
un élément (24) d'obturation coulissant fixé, avec liberté de coulissement, à la partie inférieure du boîtier (10) de la cassette et pouvant se déplacer entre une première position dans laquelle l'élément (24) d'obturation coulissant obture la découpe (12b), et une seconde position dans laquelle l'élément (24) d'obturation coulissant est écarté de la première position pour ouvrir la découpe (12b);
cassette caractérisée par le fait qu'un ressort de torsion (28) présente une première section (37) fixée à l'élément (24) d'obturation coulissant, en avant de la paroi de protection (16), et une seconde section (38a) butant contre la surface avant de la paroi de protection (16), de façon à exercer constamment une force de contrainte, dirigée vers l'avant, sur l'élément (24) d'obturation coulissant.

2. Cassette à bande magnétique selon la revendication 1, dans laquelle la première section (37) du ressort de torsion (28) est sous la forme d'une spirale générant une force de torsion et enroulée autour d'un axe (27) situé près du bord avant de l'élément (24) d'obturation coulissant.

3. Cassette à bande magnétique selon la revendication 2, dans laquelle l'axe (27) est suffisamment haut pour placer sa partie supérieure

prevent substantial deformation of the sliding closure member 24. This prevents the sliding closure member from being deformed.

Employing a torsion spring as the bias spring for the sliding closure member can simplify fabrication and assembly of the magnetic tape cassette. In particular, fabrication of the sliding closure member is simplified in that a sliding core which has heretofore been required to form an under-cut used to anchor one end of the coil spring is no longer unnecessary.

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a sliding closure member (24) slidingly attached to the bottom of the cassette casing (10) and movable between a first position in which the sliding closure member (24) closes the cut-out (12b), and a second position in which the sliding closure member (24) is away from the first position to open the cut-out (12b);
characterised in that a torsion spring (28) has a first section (37) secured to the sliding closure member (24) in front of the shield wall (16), and a second section (38a) abutting against the front surface of the shield wall (16) thereby constantly to exert a frontward biasing force on the sliding closure member (14).

2. A magnetic tape cassette according to claim 1, wherein the first section (37) of the torsion spring (28) is in the form of a coil generating torsional force and wound around a pin (27) near the front edge of the sliding closure member (24).

3. A magnetic tape cassette according to claim 2, wherein the pin (27) is sufficiently tall to position its top near the lower surface of a ceiling of the cassette casing (10) so as to abut thereagainst when the sliding closure member (24) is slightly deformed downward.

4. A magnetic tape cassette according to claim 3, which further comprises a pivotal closure lid (17) openably to close the front end opening of the cassette casing (10).

5. A magnetic tape cassette according to claim 4, wherein the pivotal closure lid (17) is co-operative with the sliding closure member (24) for movement between a first closed position and a second open position as the sliding closure member (24) moves between the first and second positions.

6. A magnetic tape cassette according to claim 3, which further comprises a locking means (29, 31, 32, 33) releasably to lock the sliding closure member (24) at the first and second positions.

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un élément (24) d'obturation coulissant fixé, avec liberté de coulissement, à la partie inférieure du boîtier (10) de la cassette et pouvant se déplacer entre une première position dans laquelle l'élément (24) d'obturation coulissant obture la découpe (12b), et une seconde position dans laquelle l'élément (24) d'obturation coulissant est écarté de la première position pour ouvrir la découpe (12b);
cassette caractérisée par le fait qu'un ressort de torsion (28) présente une première section (37) fixée à l'élément (24) d'obturation coulissant, en avant de la paroi de protection (16), et une seconde section (38a) butant contre la surface avant de la paroi de protection (16), de façon à exercer constamment une force de contrainte, dirigée vers l'avant, sur l'élément (24) d'obturation coulissant.

2. Cassette à bande magnétique selon la revendication 1, dans laquelle la première section (37) du ressort de torsion (28) est sous la forme d'une spirale générant une force de torsion et enroulée autour d'un axe (27) situé près du bord avant de l'élément (24) d'obturation coulissant.

3. Cassette à bande magnétique selon la revendication 2, dans laquelle l'axe (27) est suffisamment haut pour placer sa partie supérieure

près de la surface inférieure du plafond du boîtier (10) de la cassette de façon à buter contre ce dernier lorsque l'élément (24) d'obturation coulissant se déforme légèrement vers le bas.

4. Cassette à bande magnétique selon la revendication 3, qui Comporte en outre un couvercle (17) d'obturation pivotant pour obturer l'ouverture d'extrémité avant du boîtier (10) de la cassette, avec possibilité de la réouvrir.

5. Cassette à bande magnétique selon la revendication 4, dans laquelle le couvercle (17) d'obturation pivotant coopère avec l'élément (24) d'obturation coulissant pour se déplacer entre une première position fermée et une seconde position ouverte lorsque l'élément (24) d'obturation coulissant se déplace entre la première et la seconde positions.

6. Cassette à bande magnétique selon la revendication 3, qui comporte en outre des moyens de verrouillage (29, 31, 32, 33) pour verrouiller, avec possibilité de déverrouillage, l'élément (24) d'obturation coulissant à la première et à la seconde positions.

Patentansprüche

1. Eine Magnetbandkassette mit:
einem Kassettengehäuse (10) mit einer vorderen Stirnseiten-Öffnung und einem unterseitigen Ausschnitt (12b) im vorderen Rand eines Gehäuse-Bodens, und einer Schutzwand (16), die sich am rückwärtigen Rand des Ausschnitts (12b) entlang erstreckt und einen im wesentlichen umschlossenen Innenraum begrenzt, der eine Bandspule (13) aufnimmt, auf die ein Magnetband (14) gewickelt ist, und einer Bandlaufbahn, die über die Öffnung und den Ausschnitt nach vorn und unten freiliegt; und
einem verschiebbaren Verschlußelement (24), das verschiebbar am Boden des Kassettengehäuses (10) angebracht und bewegbar ist zwischen einer ersten Stellung, in der das verschiebbare Verschlußelement (24) den Ausschnitt (12b) verschließt, und einer zweiten Stellung, in der das verschiebbare Verschlußelement (24) von der ersten Stellung entfernt angeordnet ist, um den Ausschnitt (12b) zu öffnen;
dadurch gekennzeichnet, daß eine Torsionsfeder (28) einen am verschiebbaren Verschlußelement (24) vor der Schutzwand (16) befestigten ersten Abschnitt (37) und einen an der vorderen Fläche der Schutzwand (16) anliegenden zweiten Abschnitt (38a) aufweist, um dadurch dauernd eine nach vorn gerichtete Vorspannkraft auf das verschiebbare Verschlußelement (24) auszuüben.

2. Eine Magnetbandkassette nach Anspruch 1, in welcher der erste Abschnitt (37) der Torsionsfeder (28) die Form einer Spirale aufweist, die eine Torsionskraft erzeugt und um einen Stift (27) nahe dem vorderen Rand des verschiebbaren Verschlußelementes (24) gewickelt ist.

3. Eine Magnetbandkassette nach Anspruch 2, in welcher der Stift (27) ausreichend lang ist, um mit seinem oberen Ende nahe der unteren Fläche einer Abdeckung des Kassettengehäuses (10) so angeordnet zu sein, daß er an dieser anliegt, wenn das verschiebbare Verschlußelement (24) etwas nach unten verformt ist.

4. Eine Magnetbandkassette nach Anspruch 3, welche ferner einen schwenkbaren Verschlußdeckel (17) aufweist, der geöffnet werden kann, um die vordere Stirnseiten-Öffnung des Kassettengehäuses (10) zu verschließen.

5. Eine Magnetbandkassette nach Anspruch 4, in welcher der schwenkbare Verschlußdeckel (17) mit dem verschiebbaren Verschlußelement (24) zusammenwirkt zur Bewegung zwischen einer ersten geschlossenen Stellung und einer zweiten offenen Stellung, während das verschiebbare Verschlußelement (24) sich zwischen der ersten und zweiten Stellung bewegt.

6. Eine Magnetbandkassette nach Anspruch 3, welche ferner eine Sperreinrichtung (29,31,32,33) aufweist, die entsperrbar ist, um das verschiebbare Verschlußelement (24) in der ersten und zweiten Stellung zu arretieren.