CONVENTION APPLICATION FOR STANDARD PATENT OR A STANDARD PATENT OF ADDITION

Full name(s) of Applicant(s)

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

"STORAGE CONTAINER FOR COMPACT CASSETTES"

which is described in the accompanying complete specification.

DETAILS OF BASIC APPLICATION(s)

Number(s) of Basic Application(s) 83108473.6

Name(s) of Convention Country(ies) in which Basic Application(s) was/were filed

European Patent Office

Federal Republic of Germany

(respectively)

Date(s) of Basic Application(s) August 29, 1983

(respectively)

My/Our address for service is:

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Dated this FOURTEENTH day of AUGUST 1984

By: Registered Patent Attorney

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)
DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention Application made for a patent for an invention entitled:

"STORAGE CONTAINER FOR COMPACT CASSETTES"

We Peter Ackeret and Dr. Peter Heibling

Care of idn inventions and development of novelties ag
Hartbertstr. 9
CH - 7002 Chur, Switzerland

do solemnly and sincerely declare as follows:

Full name(s) and address(es) of Declarant(s)

Peter Ackeret and Dr. Peter Heibling
Hartbertstr. 9
CH - 7002 Chur, Switzerland

We are authorised by idn inventions and development of novelties ag

the applicant(s) for the patent to make this declaration on its/their behalf.

The basic application(s) as defined by Section 141 of the Act was/were made
European Patent Office,
in Federal Republic of Germany

on 29 August 1983
by idn inventions and development of novelties ag

We are the actual inventor(s) of the invention referred to in the basic application(s)

(or where a person other than the inventor is the applicant)

of

PETER ACKERET

of

Allmendstr. 18
CH - 8700 Küsnacht
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(respectively)

is/are the actual inventor(s) of the invention and the facts upon
which the applicant(s) is/are entitled to make the application are

as follows:

The said applicant is the assignee of the actual inventor

The basic application(s) referred to in paragraph 2 of this Declaration was/were the first application(s) made in a Convention country in respect of the invention(s) the subject of the application.

Declared at Switzerland his 2nd day of August 1984

To: The Commissioner of Patents

Signature of Declarant(s) 11/81

Peter Ackeret Dr. Peter Heibling
Container for accommodating compact cassettes having a housing which is open at one narrow side and in which a slider member having a front wall, a rear wall and a base connecting the two is arranged so that it can slide, having a spring arrangement which biases the slider member to an outer end position defined by stops, having a locking arrangement which can be manually released and retains the slider member in the housing against the bias of the spring arrangement, and having retaining projections arranged on the base of the slider member for locking the tape-winding core-hubs of an inserted compact cassette, characterised in that the base of the slider member comprises a central part on which the projections are arranged one behind the other in the direction of movement of the slider.
member and the length of the guide means and the position of the stops are such that in the end position the projection that is nearer to the housing lies in front of the front end wall of the housing.
The following statement is a full description of this invention, including the best method of performing it known to me/us:
Storage container for compact cassettes

The invention relates to a storage container for compact cassettes having the features mentioned in the pre-characterising clause of patent claim 1. Such a container is known from DE-C-22 48 408.

In the known container, the arrangement is such that the compact cassette lies inside with its face which is opposed to the tape head adjacent the front wall of the slider member. The known container can be stacked together with further containers of identical construction to form blocks or collections which are frequently conveyed in motor vehicles. Recesses are often provided in vehicles, for example in their central consoles, into which such a collection can be fitted, if necessary using an adaptor.

Occasionally, however, although these recesses have a considerable depth, they have only a relatively small opening so that it is possible to accommodate only small collections composed of the known containers, while the depth of the recess is inadequately utilised.

The problem of the invention is to provide a container, using the features mentioned in the pre-characterising clause of patent claim 1, which permits,
especially in the last-mentioned case, a more advantageous utilisation of the space.

The features given in the characterising part of patent claim 1 solve this problem.

As a result of these features, a compact cassette can be lifted comfortably over the front wall of the slider member because the troublesome rear retaining projection is exposed. It is still possible, however, to provide the slide bar for the slider member on or adjacent the central part of the base of the slider member, which in view of the long extraction travel of the slider member is especially important; if, in fact, the lateral guide means were to be provided at the external edges, then there would be a danger of jamming, especially if the parts distorted, the parts being thin-walled parts injection-moulded from plastics material, as is customary.

The spring arrangement should also be arranged as near to the centre as possible so that only minimum torques are transmitted to the locking arrangement when the container is closed; otherwise, under unfavourable conditions, especially at high temperatures, there would be a danger, namely in the case of the most commonly used plastics materials, of permanent deformation owing to cold flow. Such high temperatures are, however, common especially in motor vehicles.

Finally, it is clear that the manner of
construction according to the invention produces a container that is favourable with regard to cost and can be manufactured using a minimum of material.

It should be mentioned that it is known per se from DE-C-20 33 388 to accommodate compact cassettes in the same orientation in motor vehicles.

Embodiments of the subject of the invention are explained in detail below with reference to the accompanying drawings.

Fig. 1 shows a perspective view of a cassette container according to the invention, the slider member being in the position for removal of the cassette ("container open").

Fig. 1a is a perspective partial view, corresponding to Fig. 1, illustrating the guide means for the slider member,

Fig. 1b is a schematic cross-section, corresponding to Fig. 1, perpendicular to the direction of movement of the slider member,

Fig. 2 is a cross-section in the vertical plane parallel to the ejection direction of the slider member,

Fig. 3 is a plan view of an open container,

Fig. 4 is a front view of a closed container,

Fig. 5 is a vertical cross-section analogous to Fig. 2 of a second embodiment, the cross-section being off-set as indicated by the line 5-5 in Fig. 6,
Fig. 6 is a horizontal cross-section through a closed container according to the second embodiment.

Fig. 7 is a partial cross-section analogous to Fig. 6 of the open container, and

Figs. 8a to 8d show perspective partial views of four variants of a third embodiment.

Figures 1 to 4 relate to a first embodiment. The container comprises a housing 100 on the upper and lower sides of which there are provided complementary ridges 102 and 104, respectively, so that a plurality of identical containers can be pushed together to form blocks. The slider member 106 is accommodated in the housing 130 so that it can slide. Integral with the base 108 of the housing there is formed internally a rail 110 which, in order to support a helical pressure spring 114 against buckling, has a central cross-section having a partially circular contour. In the base 108 of the housing two slots are formed which are parallel to the rails 110 and in which stops run which are formed integrally with the underside of the slider member and limit the ejection path of the slider member. These stops are shown only in Fig. 1b and are numbered 116.

The slider member comprises a front wall 118 and a rear wall 120 which are connected to each other by three base plate parts 122, 124 and 126. Between each of these base plate parts there extends a slot which
begins behind the front wall 118 and runs out behind the rear wall. Each slot has a cross-section that complements the lateral profile of the rail 110 so that its laterally projecting bars 128 engage over the inwardly directed legs 129 of the two outer base plate parts 122 and 126. As can be seen most clearly in Fig. 1a, the base plate parts have an inverted U-shaped profile, thus improving the flexural strength of the slider member. As can be seen from the same Figure, the base plate part 122 is higher than the base plate part numbered 126; in this manner allowance in made for the fact that in the region of their face which is opposed to the tape head the most widely available compact cassettes have a thickened portion of trapezoidal outline which thus lies on the lower base plate part 126.

The retaining projections 132 for the tape-winding hubs are formed integrally with the upper side of the central base plate part 124.

On the left-hand side in Fig. 1, there is hinged to the front wall 118 a small push lever 134 which has an indicating button 136 (Fig. 2); when a compact cassette is inserted, the push lever 134 is swivelled downwards against a resilient force so that the indicating button 136 appears in a window 138. In this manner it is possible to recognise immediately from the outside which containers in a stacked block of
containers are full. To compensate for the dimensional tolerances of the cassettes and the containers, there is glued to the rear wall 120 of the slider member a soft foam cushion 140 so that the push lever 134, which is indeed very small, is reliably actuated and the cassette cannot rattle in the container, for example when the container is conveyed in a motor vehicle.

A portion of the front wall, right-hand side in Fig. 1, is designed as a release button 142 for a locking hook 144 (Fig. 2) which, if upward finger pressure is applied to the button 142, is lifted out of the slot, which is aligned therewith, in the base of the housing, so that the spring 114 can push the slider member out. The hook 144 is mounted on a leaf spring 146 which is formed out of the base plate part 126 and can be deflected upwards relative to the latter.

As mentioned above, the container according to Figures 1 to 4 is so constructed that a defined insertion orientation of the compact cassette is produced; if an attempt were made to insert the cassette with its face which is opposed to the tape head at the other side, then the container could no longer be used as a result not only of the thickened portion adjacent the face which is opposed to the tape head but also of the asymmetrical arrangement on compact cassettes of the tape-winding hubs which therefore do not sit exactly in the central plane in a
container of minimum width.

The embodiment according to Figs. 5 to 7 permits a cassette to be inserted in any desired orientation despite these asymmetrical features. Since the basic construction of the housing and the slider member corresponds substantially to the first embodiment, only the differences will be explained below.

The moulded flat foot of each of the tape-winding locking projections 86 projects into a transverse slot 88 in the central base plate part; on the underside of this base plate part a wire spring 90 can be snapped into a clip at 98, while its loop-like bent ends encompass the feet of the projections. In this manner, the projections can be displaced against the bias of the spring 90 at right-angles to the direction of movement of the slider member by a distance corresponding to the length of the slots 88.

If a compact cassette is held exactly with its central line over the projections, the latter are not in exact alignment with the tape-winding hubs, but there is a certain overlap which is sufficient, when the cassette is pressed down, to allow the projections to shift laterally as mentioned and then to lock the tape-winding hubs.

In order to permit the above-mentioned alignment of the cassette when it is inserted, the rear wall of the slider member has lateral funnel-like guide faces
which can be seen in Fig. 6. As can be seen in Fig. 5, the stops 54 of the slider member limit the ejection travel of the slider member in such a manner that in the outer end position the funnel opening is approximately flush with the opening of the housing. In this manner, the cassette is guided in the correct position without the user having to exercise any special skill when inserting the cassette.

As can also be seen in Fig. 6, the two outer base plates of the slide member extend, in this case, to a certain distance beyond the rear wall so that the slider member is reliably guided despite the long ejection travel. It is thus possible to use a locking device which requires space in the depth of the housing.

There is inserted in a cage formed integrally with the slider member a control slider member 64 which can be displaced in a direction at right-angles to the travel of the slider member; in the plane of Fig. 6, it can oscillate between two stops with friction-braking and in the plane of Fig. 5 it can be deflected upwards against the bias of a spring (not shown). The spring mentioned biases the control slider member 64 in such a manner that a catch 66 formed integrally with the underside thereof is pressed against the base of the housing.

A control camming plate 80 is formed integrally
with the base of the housing in the rear region thereof and a control wedge 78 is formed integrally with the rear wall 60 of the housing. The control slider member has correspondingly arranged running surfaces so that when the slider member is pushed in its catch follows a path indicated by the dot-dash line in fig. 7. When the control slider member strikes the face 68 it is initially laterally displaced until the catch 66 strikes an upwardly inclined wedge face of the camming plate and is deflected upwards against the force of its bias spring until it slides over the camming plate and snaps in behind it. This is the inner end position of the slider member. If the user releases the slider member, it slides backwards for a distance along the face 72 until the transverse face 74 of the camming plate stops the catch 66. The slider member is thus locked against the bias of its ejection spring. If the user presses again on the front wall of the slider member, the wedge 78 with its control face 76 displaces the catch 66 in front of a second upwardly inclined wedge face of the camming plate so that the catch 66 can be lifted again and the slider member released.

In the embodiment according to Figs. 1 to 4, the slider member is guided by the two lateral base plate parts by wings of the rail at the base of the housing overlapping from the inside. In addition, one of the two lateral base plate parts supports the unlocking
button and the locking hook.

Figures 8a to 8d show four variants of a third embodiment in which the base of the slider member comprises only one central base plate. This base plate 200 is overlapped by two L-shaped rails 202 at the base 204 of the housing and is guided in this manner. The four variants show different designs of the locking and unlocking means; each variant is provided with a locking hook 206 on a leaf spring 208, which hook snaps into a recess 210 in the base of the housing, and an unlocking button 212 connected to the leaf spring, the parts 200, 206-212 being injection-moulded in one piece from plastics material.

In the embodiment according to Fig. 8a, a cross-piece 214 projects laterally from the base plate 200 over the rail 202. At its end there is a thickened portion 216 which prevents the deformation of the leaf spring from being transmitted to the base plate.

In the embodiment according to Fig. 8b, the hook, leaf spring and button are arranged centrally in the front end wall 218 of the slider member. The leaf spring is mounted on a thickened block 220 formed integrally with the underside of the base plate so that its underside is aligned with the base of the housing.

In Fig. 8c, a cross-piece similar to the cross-piece 214 in Fig. 8a is provided; in this case, however, the cross-piece 224 has a hollow profile,
corresponding in height to the base of the slider member, which is resistant to bending and torsion. In order that the slider member can still be pushed in, one rail 202 is designed correspondingly shorter.

While in Figs. 8a to 8c dust can penetrate between the front end wall of the slider member and the button, this is not possible in Fig. 8d because the button is cut out from a box-shaped projection 226 which is integral with the front end wall 218 and the external wall of which lies against one inner narrow side wall of the housing.
The claims defining the invention are as follows:

1. Container for accommodating compact cassettes having a housing which is open at one narrow side and in which a slider member having a front wall, a rear wall and a base connecting the two is arranged so that it can slide, having a spring arrangement which biases the slider member to an outer end position defined by stops, having a locking arrangement which can be manually released and retains the slider member in the housing against the bias of the spring arrangement, and having retaining projections arranged on the base of the slider member for locking the tape-winding core-hubs of an inserted compact cassette, characterised in that the base of the slider member comprises a central part on which the projections are arranged one behind the other in the direction of movement of the slider member and the length of the guide means and the position of the stops are such that in the end position the projection that is nearer to the housing lies in front of the front end wall of the housing.

2. Container according to claim 1, characterised in that the central part of the base of the slider member has an inverted U-shaped profile and bars extend
from the free U-ends parallel to the U-base, which bars are overlapped by guide rails formed integrally with the housing.

3. Container according to claim 1, characterised in that the base of the slider member has a side part on each side of the central part.

4. Container according to claim 3, characterised in that each side part has an inverted U-shaped profile and bars extend from at least one free U-end of each side part parallel to the U-base, which bars are overlapped by guide rails formed integrally with the base of the housing.

5. Container according to claim 1, characterised in that there is formed inside integrally with the base of the housing facing the base of the slider member a guide rail which, for supporting the spring arrangement constructed in the form of a helical pressure spring, has a partially circular concave profile that faces away from the base of the housing.

6. Container according to claims 2 and 5 or 4 and 5, characterised in that the guide rail lies in the space bounded by the U-profile.
7. Container according to claim 1, characterised in that guide means for the slider member extend from the front wall thereof up to at least the rear wall thereof.

8. Container according to claim 7, characterised in that the guide means extend beyond the rear wall into the housing.

9. Container according to claim 1 in which the locking arrangement comprises a hook that can be released from a catch by a button, characterised in that it is arranged in the central plane of the container.

10. Container according to claim 1 in which the locking arrangement comprises a hook that can be released from a catch by a button, characterised in that the button and hook are formed in one piece with the central part of the base of the slider member.

11. Container according to claim 10, characterised in that a cross-piece extends laterally from the central part over the guide means of the slider member and the button and hook are formed integrally with the cross-piece.
12. Container according to claim 10, characterised in that a cross-piece extends laterally from the central part through a space left free by the slider member guide means and the button and hook are formed integrally with the cross-piece.

13. Container according to claim 10, characterised in that an intermediate piece that is resistant to distortion is provided between, on the one hand, the central part and, on the other hand, the button/hook assembly.

14. Container according to claim 3, in which the locking arrangement comprises a hook that can be released from a catch by a button, characterised in that the button and hook are formed integrally with one of the side parts.

15. Container according to claim 1, in which the locking arrangement comprises a hook that can be released from a catch by a button, characterised in that there is formed integrally with the front end wall of the slider member a box-shaped intermediate piece which is formed in one piece with the button and hook.

16. Container according to claim 1, characterised in that the central part of the base of the slider
member is designed to accommodate the thinner region of the compact cassette (as distinct from the trapezoidally contoured thickened portion of the compact cassette in the region of the face of the compact cassette which is opposed to the tape head).

17. Container according to claim 3 and claim 16, characterised in that one of the side parts is designed to accommodate the thickened portion of the compact cassette in the region of the face of the compact cassette which is opposed to the tape head.

18. Container according to claim 1, characterised by an indicating member which is provided at the front end wall of the slider member and can be actuated by inserting a cassette into the container.

19. Container according to claim 1, characterised in that the retaining projections can be displaced at right-angles to the direction of movement of the slider member in alignment with the tape-winding core-hubs of the compact cassette.

20. Container according to claim 1, characterised in that the locking arrangement comprises a catch which can be controlled by a camming plate and which, when the slider member is pushed in, can be displaced out of
the end position into a locked position from which, by pushing the slider member into the housing again, it can be returned to an unlocked position.

DATED this EIGHTH day of AUGUST, 1984

Inventions and development of novelties are

Patent Attorneys for the Applicant
SPRUSON & FERGUSON
outside which containers in a stacked block of
When the slider is inserted, the rear wall of the slider member has lateral funnel-like guide faces.