

3
12

-1-

2099793

CONTAINERS FOR MAGNETIC TAPE CASSETTES

This invention relates to containers for accommodating standard magnetic tape cassettes.

A known form of container for a standard magnetic tape cassette consists of a housing with a drawer, the housing and
5 drawer together defining a substantially rectangular space for accommodating a cassette. In the known container, an ejection spring is provided to push the drawer out of the housing and a releasable locking mechanism retains the drawer in its pushed-in position. Such a container is described
10 and shown in West German Patenschrift 22 48 408 and such containers are commercially available. The known containers provide practical and neat storage for magnetic tape cassettes and, at the same time, they are suitable for the retail
'packaging of new cassettes.

15 Such known containers are, however, less suitable for pre-recorded cassettes (sometimes called music cassettes or, in Germany, "Musikassetten") because they require more space on the customary sales shelves than do the familiar partly transparent cassette storage boxes with a fold-over hinged
20 closure. The reason for that is, primarily, that the ejection spring, which makes possible the one-handed use of the container, takes up a relatively large amount of space and, since it is a helical spring requires to be supported to prevent buckling.

25 For the purpose of selling pre-recorded cassettes, labels could be stuck on the known containers with the drawer and

ejection spring. Alternatively, the containers could be made from transparent plastics material and labels inserted within the containers. Such an arrangement would, however, be disadvantageous because
5 the helical spring might damage the label or the label might become jammed in the spring.

The problem underlying the invention is to provide a container for a standard tape cassette which may have the same small dimensions as the familiar
10 boxes with the hinged closure but, nevertheless can, with comfort, be used with only one hand.

The present invention provides a container for a standard magnetic tape cassette the container comprising a housing with a drawer, an ejection spring to eject the
15 drawer from the housing, and a releasable locking mechanism to hold the drawer in its pushed-in position against the bias of the spring, wherein the spring is in the form of a coiled torsion spring comprising a coil and a projecting leg at at least
20 one end of the coil, the spring being mounted on one of the two members constituted by the drawer and the housing, and the distal end of the projecting leg at the or one end of the coil slidably engaging a surface on the other of the two members, which surface
25 extends transversely with respect to the direction of movement of the drawer.

It is possible to make such a container, at least in part, of transparent plastics material and to provide a packing label that is presented in readily readable form and neither interferes with
5 the operation of the spring nor

can be damaged by it.

Containers constructed in accordance with the invention will now be described by way of example only with reference to the accompanying drawings, in which:

5 Figure 1 is an "exploded" perspective view of a first container constructed in accordance with the invention.

Figures 2 and 3 show in vertical section alternative forms the sides of the housing of the container can take,

10 Figure 4 is a schematic view of the interior of the container when closed and accommodating a cassette,

Figure 5 is similar to Figure 1 but shows a second container constructed in accordance with the invention,

15 Figure 6 is again similar to Figure 1 but shows a third container constructed in accordance with the invention, and

Figure 7 is a front elevation showing two containers according to Figure 6 fitted together to form a unit.

20 Referring to Figures 1, 2 and 4, a container for a standard magnetic tape cassette comprises a housing 10, a drawer 14 with a spring 16, and a label 18.

The housing 10 is integrally formed from plastics material

by injection moulding and has side walls 20 and 22, a rear wall 24 and a top wall 26. On the outside, the walls are completely smooth except that, if desired, stacking grooves and projections (not shown) can be provided and except that a moulded locking bar 28 is provided. Guide rails 30 (or alternatively, as shown in Fig. 3, a single guide ledge 30') project inwardly from the side walls 20 and 22. A ledge 32 serving as a stop for the spring projects inwardly from the rear wall 24. A stop wedge 34 extends downwardly in a central position from the top wall 26.

The drawer 14 is integrally formed and consists of transparent plastics material, preferably polystyrene. The drawer 14 comprises a smooth, flat bottom plate 40 having narrow, upright side parts 42 which fit, with clearance, between the guide rails 30. Onto the upper edges of the parts 42, are moulded laterally projecting guide elements 44 which project between the guide rails and are guided there in a slidable manner. In the alternative construction shown in Fig. 3, upright side cheeks 46 are attached to the guide elements 44 and, because in this region a standard cassette such as cassette 50 has a guide projection 52, the container is made correspondingly wider. It is to be noted, however, that the dimensions in the direction of the depth of the cassette are not enlarged by the guide means, since the guide means are outside the region where a standard cassette has a portion of increased thickness adjacent its tape-head opposing face.

Upstanding projections 12 are provided to serve as stops for the magnetic tape winding hubs of an inserted cassette.

There is also attached to the bottom plate 40 a front plate 48 which has corner elements on both sides serving as label holders. Exactly below the corner elements 54, the guide elements 44 are provided with a cut-away portion 45 which facilitates the removal of the cassette and also makes it possible to manufacture the drawer in a simple injection-mould, without any problems such as possibly having to provide an undercut for the corner elements 54 to enable the drawer to be removed from the mould. The corner elements are stiffened towards the bottom by narrow edge protrusions 55. The locking hook 28 moulded onto the housing engages over the left-hand edge protrusion (Fig. 1), when the drawer is pushed into the housing. Opposite to the front plate, there is moulded onto the bottom plate 40 an end plate 58 which is flush with the spring stop ledge 32 of the housing when the drawer 14 is pushed in. Projecting upwards from the end plate 58, in a central position, there is a fixing post 60 which is stiffened by being given a relatively large thickness and having a semi-circular cross-section. A torsion spring 16 comprising a helical coil or neck with a respective leg or end wire 64 projecting from each end of the neck is located on the post 60. The end wires 64 project in a 'V' towards the rear wall 24 of the housing and are bent round at their free ends. A label 18 is inserted in the drawer, the contours of which label are such that a bottom tab 68 of the label fits between the side parts 42, an end tab 70 of the

label lies against the end plate of the drawer, and a front tab 72 of the label extends over the whole depth and breadth of the front plate of the drawer, the free corners being clamped under the corner elements. After
5 the label has been inserted, the projections 12 of the drawer project through slots 36 in the label.

After the label and the cassette have been inserted, the drawer is pushed into the housing in the direction of arrow 74, which results in the fixing post contacting the
10 wedge 34, the fixing post pressing the wedge upwards, and the top wall of the housing springing out, after which the post snaps in behind the wedge. In that operation, the ends 64 of the spring make contact with the rear wall of the housing and, when the drawer is pushed further in, they
15 are spread outwardly so that the drawer is biased by the spring in the direction of opening. The spring stop ledge 32 prevents the ends of the spring from sliding downwards. Finally, the left-hand thickened end portion of the front plate of the drawer makes contact with the inclined face 76
20 of the locking bar 28, springs the locking bar outwards and finally, when the drawer is fully pushed in, allows it to snap over. By lateral pressure on the locking bar, the drawer can be unlocked whereupon it is pushed out of the housing by the spring 62 until the fixing post 60 again
25 contacts the stop wedge 34.

From Fig. 4 it can be seen that the helical part of the spring 16, which increases its diameter when tensioned, is in a clearance space above the cassette which is situated in an inclined position and relatively thin in this region.

23

By this means, damage to the cassette by the spring is avoided.

5 If desired, stacking elements can be provided at or in the top wall 26 of the housing or at the faces, which are free below, of the guide rails 30 or guide protrusions 30'.

Numerous modifications within the scope of the invention can be made to the container described, some of these modifications being mentioned below.

10 It is not absolutely necessary for the housing to be open at the bottom; it can also be closed by a transparent plate or, alternatively, it may have a stabilising cross-piece at the front and/or the rear which, together with the ledges 30 or 30', forms a frame. The
15 drawer also, however, can have open frame pieces, which may be termed bottom part or front part, instead of transparent bottom and front plates.

It is also not absolutely necessary, although very desirable, to have the braking elements for stopping the
20 magnetic tape winding hubs. They can alternatively, however, for example, be bonded inside in the label or, alternatively, they can be attached to a support which is secured inside the drawer after the label has been inserted, for example, a support held between the upright side parts
25 42. Finally, instead of the projections 12 shown in the

embodiment, brakes constructed in a different manner can also be provided that, for example, are displaced when the cassette is pushed in and removed.

The embodiment of the spring shown is preferred for reasons of manufacturing expense. If the housing, as shown, is open at the bottom, the spring should be attached either to the drawer or to the housing or, in any event, should be secured against falling out when the container is open. It is important that the spring utilises the space which remains between the cassette and the housing where the cassette is relatively thin, that is to say outside the thickening of the cassette adjacent the face opposed to the tape-head.

Furthermore, in the embodiment, the stop wedge 34 is arranged at a place where the housing can spring outward when the drawer is pushed in for assembly. Another place where the housing can spring out relatively well would be in the front region of the guide means where, therefore, the stops could also be accommodated.

The locking means does not necessarily have to be constructed on the housing and in the manner shown; for example, the drawer could, alternatively, be provided with a resilient locking bar.

The external broad or major side of the housing can be provided with a recess into which, for example, a manufacturer's label on a piece of paper can be bonded.

Fig. 5 is distinguished from the embodiment according to Figs. 1 to 4 by the design of the arrangement of the spring and the corresponding parts of the housing and

drawer; consequently, only those features which are different will be explained in detail below.

As ejection spring there is used again a legged neck spring in the case of which, however, the coiled main part 100 is now located in the housing and, indeed, in a corner where a short and a long narrow side wall meet. As in Figs. 1 to 4, the axis of the main part of the spring is oriented perpendicularly to the top wall 126 and one free leg 102 is supported on the rear wall 124 of the housing while the other, longer, leg 104 lies against the rear plate of the drawer 158. A groove 106 let into this rear plate supports the leg in an upward and downward direction and thus fulfils the same function as the protrusion 32 in the case of Figs. 1 to 4. Since the coiled main part 100 is stationary, the end of the leg 104 lying against the rear plate of the drawer must slide in the groove 106 when the drawer is moved and therefore it is appropriately bent round. In the case of this embodiment, the main part of the spring is in a place where a cassette in the container has a rounded off edge and therefore offers space for accommodating the spring itself and also, to some extent, for holding means provided for this spring.

There can also be seen a strip 110, shown by a dashed line, at the free edges of the front tab of the label which can be bonded onto the outside of the housing and, if it is still attached to the label, offers a guarantee to the user that the cassette originally packed is in the container.

26

The container according to Figs. 6 and 7 comprises the following components: housing 210, drawer 214, spring 216 and label 218.

In this case, the housing 210 is constructed from two parts and, in fact, comprises a first housing part 210a, two side walls 2120 and 2122 and also one broad side or major wall of the housing or, in short, top wall 226, and this first housing part is integrally injection-moulded from transparent plastics material.

In this case, the second housing part 210b is injection-moulded from non-transparent, preferably coloured, plastics material and comprises a bottom wall 221 and a rear wall 224. Stacking rails 223 are provided on the upper side of the top wall 226, and there are complementary stacking grooves 225 in the bottom wall 221. Parallel to the direction of movement of the drawer 214, the bottom wall also has elongated guide rails 230 having an undercut profile which fit into the inside of the container and extend at least almost over the whole depth of the housing 210, and parallel to these rails and lying closer to the middle of the container, there are slots 234 in which stop lugs moulded onto the drawer run. Adjacent the housing opening there are two opposed apertures in the bottom wall. The aperture 237 serves to accommodate a positioning tab 239 on the label 218, and a positioning tab 243 of the label fits also into the aperture 241, but this aperture, however, is enlarged

towards the inside in the direction towards the rails 230 and serves as lock opening for a releasable locking catch 228 that is moulded onto the drawer. The catch and the associated lock opening corresponds approximately to the construction as described and shown in West German Patent Schrift 22 48 408; it will be described in detail below.

The two housing parts, which can be injection-moulded, together with the described features, in relatively simple shapes, are welded to each other along the points of contact between the narrow side walls and the bottom or top wall by means of ultrasonic welding, or connected to each other in any other manner. If desired, the whole housing can also be injection-moulded, in that case in a somewhat more complicated shape, from transparent material, in that case however, for aesthetic reasons, it is recommended that at least the bottom wall be rendered opaque, for example, by rendering it matt, and preferably similar provision is made also for the rear wall 224.

In cross-section parallel to its direction of movement, the drawer 214 is approximately U-shaped. It is preferably injection-moulded from non-transparent (coloured) plastics material. Its bottom plate has the customary magnetic tape winding locking projections for the spools of magnetic tape of an inserted cassette (not shown) and has longitudinal slots 244 which are complementary to the foot profile of the rails 230. The head profiles of the rails 230 pass through correspondingly enlarged apertures 242 in the rear plate 206 of the drawer. The relatively thick portion of the cassette adjacent

28

the face opposed to the tape-head fits into a complementary aperture or indentation 229 in the bottom plate, similar to that described in West German Patent Schrift 25 21 371, and the relatively thin portion of the cassette is pressed upwards by tongues 245 that are cut out of the bottom plate and are pre-tensioned upwards. Two or more tabs 254, which are moulded onto the upper edge of the rear plate 206 of the drawer and project in the direction towards its front plate 248, serve as holders for the cassette. These tabs serve also to support the main face of the label when the drawer is pushed out, so that when being pushed in again the cassette does not run onto the edge of the label and bend it. A button 260 is cut out of the front plate and the material-dividing slot 262 continues into the bottom plate so that, relative to the rest of the drawer, the button can be directed resiliently upwards and in that operation the catch 228, which is arranged in that region of the bottom plate, is lifted out of the lock opening 241. This is made clear to the user by an arrow-shaped aperture 270 on the button and, at the same time, the user can ascertain through this aperture whether there is a cassette in the container or not.

There is used as ejection spring a legged neck spring 216 having relatively long free legs 264 and 265. The

leg 264 lies in the region of the inner angle between the bottom wall 221 of the housing and the rear wall 224 of the housing; it can be held between the latter and one rail 230, which is then constructed slightly shorter, and/or a support projection can be moulded onto the housing in this corner. It should be pointed out that, in such a construction, for example, the spring can be, or in some cases has to be, inserted before the two housing parts 210a and 210b are connected to each other.

The other free leg 265 of the legged neck spring is bent round at the end and lies with this rounding in an elongated indentation 266 on the outside of the rear plate 206 of the drawer facing the rear wall 224, where, when the spring is released from tension during the pushing out movement, the free end of the leg is guided in a slidable manner. It should be noted that the very thick part of the spring, namely, its screw coil lies in a corner of the housing where the cassette has a rounding and as a consequence leaves space for the spring. Furthermore, it should be noted that this type of pre-tensioned spring makes possible constructions in the case of which the locking and releasing of the lock can be made using one or both legs of the legged neck spring. A link guide or equivalent means can then be provided at the rear plate of the drawer which cooperates with the leg 265, which can be moved not only in the plane of movement of the drawer but also perpendicularly thereto, in order thus to provide a locking means which, when the drawer is pushed in, hooks into a hook projecting forwards from the other leg and, when the drawer is repeatedly given short pushes further in, is

released again.

Finally, the label has a shape that corresponds to the transparent walls of the housing and is inserted into the ready assembled housing. Furthermore, as shown, there can be attached to the main face 280 of the label, which, in general, has picture information while the side faces 282 have, in text form, the details of the contents of the tape, also a security face 284 which is connected to the main face, for example, by a tear thread 286. The security face is of reduced length, leaving the button of the drawer free, and is gummed on the inside. After the label has been inserted, the security face is bonded outside onto the front plate of the drawer. If the container is used as sales packing, an undamaged tear thread ensures that the cassette originally inserted is in the container.



CLAIMS:

1. A container for a standard magnetic tape cassette the container comprising a housing with a drawer, an ejection spring to eject the drawer from the housing, and a releasable locking mechanism to
5 hold the drawer in its pushed-in position against the bias of the spring, wherein the spring is in the form of a coiled torsion spring comprising a coil and a projecting leg at ■ at least one end of the coil, the spring being mounted on one of the
10 two members constituted by the drawer and the housing, and the distal end of the projecting leg at the or one end of the coil slidably engaging a surface on the other of the two members, which surface extends transversely with respect to the direction of move-
15 ment of the drawer.
2. A container as claimed in claim 1, wherein the spring comprises a helical coil with a respective projecting leg at each end of the coil, the helical coil lies in a corner of the housing, the end of one
20 leg is located in a slot in a rear plate of the drawer, and the end of the other leg mounts the spring on the housing.
3. A container as claimed in claim 2 for a cassette having rounded corners at the edge remote from the



321

tape-head opposing face of the cassette, wherein
at least part of the spring is located in a free
angle inside the container adjacent the position
assumed, in use, by one of the rounded corners of
5 the cassette.

4. A container as claimed in claim 1, wherein
the location of the spring is such as to make use of
the



relatively thin part of a standard cassette, the arrangement being such that when a cassette is accommodated in the container, the spring lies adjacent the relatively thin part and the tape-head opposing face of the cassette lies
5 against a front wall of the drawer.

5. A container as claimed in claim 1, wherein, when a standard cassette is accomodated in the container with the drawer pushed-in, the cassette has its tape-head opposing face lying against a front wall of the drawer,
10 and the spring is located away from the thickened part of the cassette and beneath a major wall of the housing opposed to the bottom of the drawer.

6. A container as claimed in any of claims 3 to 5, wherein the spring comprises a helical coil with a
15 respective projecting leg at each end of the coil, and the spring is stayed by one leg on the housing and by the other leg on the drawer, the axis of the coil being generally perpendicular to the bottom of the drawer.

7. A container as claimed in claim 6, wherein one of
20 the legs is secured to the housing or to the drawer.

8. A container as claimed in claim 6, wherein the coil is mounted on the drawer.

9. A container as claimed in claim 7 or 8, wherein at least one of the legs lying against the housing or
25 drawer is guided in a slidable manner.



34

- 17a -

10. A container as claimed in claim 8, wherein a stop provided on the housing lies in the path of movement of a



35
post provided on the drawer, the post serving as a counter-stop and to mount the coil.

5 11. A container as claimed in claims 9 and 10, wherein at the end of the drawer opposed to a front wall of the container, there is provided a projecting part located substantially parallel to the front wall, the post forming a part of the end projecting part, and a guide for a leg of the spring being formed by a ledge that runs substantially parallel to a major external wall of the housing, the arrangement being such that when the drawer is pushed in, the ledge lies over the end projecting part.

12. A container as claimed in claim 1, wherein the arrangement is such that a label can be inserted and those parts of the container in the region where lettering of the label is to appear are transparent.

13. A container as claimed in claim 12, wherein the housing is arranged to enclose a cassette on five of its six sides and is open at a narrow side, while the drawer is guided in a slidable manner past one major wall of the housing and also has a front wall to close the open narrow side of the housing, and the other major wall of the housing has a transparent region to make visible the main face of an inserted label having at least one tab attached laterally to the main face of the label, the said at least one tab being arranged to lie behind the corresponding narrow side wall of the housing, the same narrow side wall being likewise transparent and being integrally injection-moulded together with the transparent broad side wall.



14. A container as claimed in claim 13, including a label to the main face of which are attached two tabs which are uncoiled on both sides behind the corresponding narrow side walls of the housing and are supported at the
5 opposed housing wall.

15. A container as claimed in claim 14, wherein extensions projecting as far as a rail arrangement serving to guide the drawer are attached to the uncoiled tabs, and, in the region backed by the extensions, the bottom of the
5 drawer is also transparent, it being arranged that the extensions do not impair the movement of the drawer.

16. A container as claimed in any one of claims 12 and 15, wherein the whole housing is integrally injection-moulded from transparent plastics material and substantially all regions of the housing part which are not to be backed
5 by faces of the label are masked or printed or rendered non-transparent in any other manner.

17. A container as claimed in any one of the preceding claims, wherein it is arranged that a or the label can be inserted into the container when it is assembled or while it is being assembled without being hindered by the ejection
5 spring.

18. A container as claimed in any one of the preceding claims, wherein the drawer is injection-moulded from non-transparent plastics material.

19. A container as claimed in claims 16 and 18, wherein the transparent housing portions not backed by portions of the label are covered by non-transparent portions moulded



onto the drawer which lie behind the non-backed transparent housing portions, the non-backed transparent housing portions being thus, in effect, rendered non-transparent.

5 20. A container as claimed in claim 19, wherein the housing has label tab receiving apertures in the region of its opening.

21. A container as claimed in claim 13, wherein a projecting tear-off tab, bondable to the housing or the
10 drawer after closing, is attached to the edge of the main face of the label running along the opening.

22. A container as claimed in claim 12 for a cassette having a portion of increased thickness in the region of its tape-head opposing face, wherein the housing is
15 arranged to enclose a cassette by external walls of the housing on at least two of the opposed minor sides and one of the major sides of the cassette and the drawer is arranged to be guided in a slidable manner between the two parallel external walls of the housing and to lie with its
20 bottom against the other major side of the cassette and with a prespective end wall against each narrow face of the cassette where the housing has an opening, at least the bottom of the drawer and at least the front face of the drawer, at least over the largest part of their surfaces,
25 being transparent, through which transparent face regions a label, inserted in the drawer when the container is used, can be seen even when the container is closed.



38

23. A container as claimed in claim 22, wherein the drawer part is manufactured from transparent plastics material and has a closed bottom and a closed front wall.

24. A container as claimed in claim 22 or 23, wherein
5 the housing is substantially open in the region which the second major side of a cassette occupies when a cassette is accommodated in the container.

25. A container as claimed in claim 22 or 23, wherein the housing has a wall consisting of transparent material
10 in the region which the second major side of a cassette occupies when a cassette is accommodated in the container.

26. A container as claimed in any one of claims 22 to 25, wherein the drawer has transparent side plates and a transparent end face lying against walls of the narrow
15 sides of the housing, which walls of the narrow sides of the housing are likewise transparent.

27. A container as claimed in any one of claims 22 to 26, wherein the major wall of the housing opposed to the drawer bottom is transparent or open in the region where,
20 when the drawer is pushed in, a label is behind it.

28. A container as claimed in claim 1, wherein on parallel external narrow side walls, the housing has rails or projections for guiding the drawer.

29. A container as claimed in claims 24 and 28, wherein
25 the rails or projections have external faces that are in alignment with the drawer bottom.

30. A container as claimed in any one of claims 23 to 29, wherein the bottom of the drawer has step-like guide



ledges that are off-set with respect to its main face and are constructed so that they complement drawer guides of the housing.

31. A container as claimed in claim 30, wherein the
5 guide ledges are cut-away near the front wall of the drawer.

32. A container as claimed in any one of claims 22 to 31, wherein projections for holding a label are arranged at the free end of the front wall.

10 33. A container as claimed in claim 32, wherein the projections are provided in alignment with the cut-away portions of the front wall.

34. A container as claimed in claim 12 having brake elements for stopping the magnetic tape winding cores of
15 a cassette, wherein the brake elements are arranged on a support that is secured on the side of the label turned inwards at the drawer.

35. A container as claimed in claim 12 having brake elements for stopping the magnetic tape winding core of
20 the cassette, wherein the brake elements are provided in the form of projections on the inside of the bottom of the drawer and the label has through openings in alignment with these.

36. A container as claimed in claim 12 having brake
25 elements for stopping the magnetic tape winding cores of the cassette, wherein the brake elements are arranged, for example bonded, on the inside of the label.



37. A container as claimed in claim 1, wherein, when a cassette is accommodated in the container, the tape-head opposing face of the cassette lies against a front wall of the drawer and the edge of the cassette opposed to the
5 tape-head opposing face lies against the bottom of the drawer, at least part of the spring being accommodated in an approximately wedge-shaped space between the cassette and an adjacent external major wall of the housing.

38. A container as claimed in any one of claims 12 to
10 15, wherein the housing consists of a first portion having the transparent regions and a second portion injection-moulded from non-transparent plastics material, the two portions being connected together to form a single whole by welding or bonding or snapping together.

15 39. A container as claimed in claim 38, wherein one of the portions of the housing has a substantially L-shaped cross-section and the other portion has a substantially U-shaped cross-section.

40. A container for a standard magnetic tape cassette,
20 the container being substantially as herein described with reference to, and as illustrated by, Figures 1, 2 and 4 of the accompanying drawings.

41. A container as claimed in claim 40 but modified substantially as herein described with reference to, and
25 as illustrated by, Figure 3 of the accompanying drawings.

42. A container for a standard magnetic tape cassette, the container being substantially as herein described with



- 23a -

reference to, and as illustrated by, Figure 5 of the accompanying drawings.

43. A container for a standard magnetic tape cassette, the container being substantially as herein described with reference to, and as illustrated by, Figures 6 and 7 of the accompanying drawings.

