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(54) CONTAINER FOR TAPE CASSETTE

(71) We, IDN INVENTIONS AND DEVELOPMENT OF NOVELTIES A.G., a Swiss Company, of CH-7078 Lenzerheide, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a container for accommodating a tape cassette.

Various forms of container for tape cassette are known or have been proposed. The known containers all suffer from the disadvantage that they are very awkward to manipulate and/or that they are very complicated.

The invention aims at providing a tape cassette container which does not suffer from the above-mentioned disadvantages, is simple to use and can be produced in a particularly simple manner. It is intended for example that the cassette should be capable of being inserted into the container or removed therefrom with only one hand, which feature can be of importance when operating a tape recorder in a moving car.

According to the present invention a container for a tape cassette comprises a drawer slideably mounted in a case for movement between an outer, open position in which a cassette can be placed in or withdrawn from the drawer and an inner, closed position, biasing means biasing the drawer towards the open position, stop means defining the open position, and releasable catch means for holding the drawer in the closed position, the sides of the drawer being at least partially cut away so that a cassette contained in the drawer can be grasped and removed therefrom.

The container can be so constructed that it is possible to place a cassette in the drawer which is in the outer position and to move the drawer into the case by finger pressure.

All that is required for removing the cassette is to operate the catch, whereupon the drawer is moved out of the case by the biasing means. The cassette can then be removed from

the slide with two fingers and can be placed in a play-back apparatus.

Preferably the drawer comprises a front wall and a rear wall interconnected by a base plate.

In this arrangement the front wall of the drawer preferably also serves to close off a narrow side of the case. This results in simplification of the container, and in addition a surface for carrying written matter is available, this surface being presented to the user when the cassette is being fitted into or removed from the container.

The base plate of the drawer may be provided with a slot which extends in the direction in which the drawer is movable and in which engages a guide projection on the case for guiding the drawer. This can result in a particularly simple construction of the container combined with saving in material, and the sides of the drawer can be completely omitted so that a cassette reposing in the drawer is particularly readily accessible.

Advantageously, the container may also be so designed that the rear wall of the drawer has at least one inner surface which slopes away from the base plate, and the case may be provided, on the inner face of the wall opposite the base plate, with guide ribs which extend in the direction of movement of the drawer and which are arranged to provide location for a cassette disposed in the container.

In this way the introduction of a cassette into the container and its removal therefrom are considerably facilitated by the use of simple means. The guide ribs can be arranged to prevent the thicker part of a standard recording-tape cassette from striking the front edge of the case with its own edge when it is being inserted into the case. On the other hand co-operation between the inclined surface and the guide ribs results in the cassette tilting away from the base plate out of the drawer when the container is disposed vertically, so that the cassette can be more easily removed. This can be of particular importance for example when several containers with cassettes

in them are so arranged on a central bracket in a car such that the direction of movement of the drawers are vertical.

5 The drawer and the case can be provided with an inter-engaging pin and slot, the slot extending in the direction of movement of the drawer and the ends of the slot forming stops for the pin for the purpose of limiting movement of the drawer. In this way a particularly simple form of stop for limiting move-
10 ments of the drawer is obtained.

If the pin is chamfered at its forward edge, this enables the drawer to be inserted into the case is a particularly easy manner. When
15 the drawer is being fitted to the case, the wall of the case in the vicinity of the pin and slot is deformed outwards by the inclined surface of the pin, so that the latter can be readily introduced into the slot.

20 The base plate can be provided with tabs for engagement in openings in the winding cores of a cassette.

In a particularly preferred form of construction of the container, the catch means includes a leaf spring extending in the direction of movement of the drawer and having at or near its free end a tooth arranged to engage a detent or recess, there also being
25 provided a push button by means of which the tooth can be disengaged from the detent or recess. The push button may be let into the front of the drawer or one of the side walls of the case.

30 The catch means so constructed in simple, occupies little additional space in the case and can be actuated by the use of only one finger.

35 The leaf spring, push button and tooth are preferably integral with the drawer or the case and conveniently are of a plastics material.

In particular, the leaf spring, push button, and tooth are conveniently integral with the drawer, and the detent is formed by an aperture in the case. In this way a construction
40 of container is obtained which can be particularly easily produced and which can be made in plastics material by injection-moulding and by using relatively simple moulds, the container consisting of three simple parts, namely the case, the drawer and the spring biasing means which can be assembled by simply inserting one into the other.

45 It is also possible to provide the case with connecting elements for detachably connecting it to an adjacent similar container to form a block, these connecting elements taking the form for example of guide tracks facilitating sliding insertion. In this way several
50 containers can be interconnected in a simple manner, and this facilitates accommodation of the containers.

55 One guide track preferably takes the form of an elongate projection having side faces chamfered to dovetail form and the other track
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can take the form of a complementary recess, the two tracks extending parallel to the direction of movement of the drawers.

An arrangement of this kind results in additional saving in material when producing the container, and at the same time the wall of the case is reinforced by the connecting elements; furthermore, when a number of containers are stacked, the wall of one case is forced to occupy a position parallel to that of the adjacent container and this is of advantage in promoting movement of the slide in the guide.
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The biasing means for moving the drawer out of the case may take the form of a coil spring formed about a notional core of elongate cross-section. Alternatively, in view of the production costs of such a spring, it is, of course, more convenient to use a normal coil spring of circular cross-section together with provision for preventing buckling failure of the spring. In a further development of the invention, this is brought about by forming a guide channel of segmental cross-section, or by providing a similar guide channel on the inner side of the housing lying opposite the base plate, or by employing both these features together. Neither of these solutions necessitates additional space and the material consumption is, in contrast, decreased.
75 80 85 90 95

It is desirable for it also to be possible to accommodate in the container an index of contents. For this purpose there may be a label inserted in the drawer and safeguarded against unintentional removal, preferably by stud-like mountings, which label can be read when the container is either standing or lying flat as soon as the drawer is opened and the cassette is removed.
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As mentioned above several containers may be joined together to form a block, for which purpose joining means of the tongue and groove or dovetail type are provided. If a large number of containers are to be joined together then this type of simple guide may no longer be adequate to impart sufficient stability to the block. Auxiliary tracks may therefore be provided, adjacent to a main track which defines the positioning, as close as possible to the margin of the large external surface of the case, which auxiliary tracks, with skilled construction—which is yet to be explained, in detail—may be provided without causing undue complications in the production of the case by injection moulding. When once attached, containers may be safeguarded against unintentional dismounting in a manner similar to that described above for the limitation of the drawer movement.
105 110 115 120

A widening of the possibilities of block formation is produced if the narrow lateral surfaces of the container housing are provided with guide tracks or grooves, since in this case adjacent containers may also be joined together in additional directions. It is
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naturally also possible to provide means permitting vertical and horizontal stacking.

The guide tracks or grooves can furthermore be used to join an angular mounting element with the container or a block of containers, and the mounting element can be attached in various ways, not only to a wall, to shelves or the like, but also, for example, to the dashboard of a motor vehicle. In a similar manner the guide means on the uppermost container can be used to mount a carrying handle by means of which a stack of containers may be comfortably carried.

Finally, several containers can be joined during manufacture to form a greater block; for example, five drawers may be provided one above the other in a block housing. Even though the stability of such a block will be no greater than that of five individual containers rigidly joined together, there is nevertheless a reduction in costs and a saving in material, because the housing walls associated with the several drawer guides no longer need to be made of double thickness. However, the guide means for attaching further containers or further block housings may be provided in a similar manner as described above. In such a large container the drawers may lie above one another, adjacent to one another, or back to back, and there are of course also combinations of all these possibilities.

The combination of the aforementioned features results in a container which provides operating convenience with economy of material and a small number of individual parts. Assembly work is also simplified.

Further details of the invention are provided in the following description of some embodiments illustrated in the annexed drawings, in which:

Figure 1 is a perspective illustration of the container in the separated condition.

Figure 2 is a section through part of the catch means on line II of Figure 1, but with the drawer inserted in the case,

Figure 3 is a view of the container with the drawer fitted in the case but in its outer position, a recording-tape cassette being placed on the drawer.

Figure 4 is a section on line IV—IV of Figure 3,

Figure 5 shows a section corresponding to that of Figure 4, but with the drawer fully inserted into the case,

Figure 6 is a partial section on line VI—VI of Figure 3 and on a larger scale, the drawer, located in its inner position, being shown by dash-and-dot lines,

Figure 7 is a section on line VII—VII of Figure 3, with the spring omitted, and shows two containers joined together,

Figure 8 is a section through a further form of the catch means,

Figure 9 is a perspective view of that part of the case that co-operates with the catch

means shown in Figure 8,

Figure 10 is a section through another form of catch means,

Figure 11 is a perspective view of the form of retaining device shown in Figure 10,

Figures 12 to 15 show an arrangement of a container with a coil spring of circular cross-section,

Figures 16 to 21 show a container with an index label and the mounting means provided therefor on the drawer,

Figure 22 is a schematic representation of two containers about to be joined together in a manner different from the arrangement shown in Figure 7,

Figure 23 is a cross-section similar to Figure 7 but following the line "23" of Figure 22,

Figures 24 to 26 show a container in which lateral joining is possible.

Figures 27 to 30 show several stacked containers according to Figures 22 and 23 in conjunction with a mounting bracket,

Figures 31 to 33 show several stacked containers according to Figures 22 and 23 in conjunction with a carrying handle, and

Figures 34 to 36 show various large containers having several drawers.

The container illustrated in Figures 1 to 7 comprises a case 1, a drawer 2 and a spring 3. The case 1 is rectangular and flat, and matches the shape of recording-tape cassette 4 (Figure 3). The drawer 2 has rear wall 5 which is connected to a front wall 7 by a base plate 6. The base plate 6 is provided with two tabs 8 which, as seen from Figure 3, are intended to engage in openings in the winding cores of the cassette 4 and to prevent the tape from unwinding in the cassette. As can be seen in particular from Figure 1, the base plate 6 has a slot 10 which extends in the direction of movement of the drawer 2 and in which a guide projection 11 on the case 1 can engage. As seen from Figure 7 the edges of the slot 10 and of the guide projection 11 have interengaging ridges 12 and 13 which prevent the drawer 2 from lifting away from the wall of the case 1. As can be seen in particular from Figures 1 and 6, the case has two slots 14 which extend in the direction of movement of the drawer 2. Rectangular pins 15, formed on the drawer 2, engage in the slots 14. Together with the pins 15, the slots 14 forms means for limiting the movements of the drawer 2 in the case 1 between an inner, closed position, in which the front 7 of the case 1 is closed by the front wall of the drawer, and an outer, open position, in which a cassette 4 can be placed on or removed from the drawer 2. As seen from Figure 6, the pins 15 have inclined faces 16 at the front as considered in the direction of insertion. The inclined faces 16 serve to facilitate the initial assembly of the drawer 2 in the case

1. Thus when the drawer 2 is inserted into the case 1, the inclined faces 16 deform the wall of the case 1 so that the wall moves away from the base plate 6 of the drawer, and the base plate may also be deformed slightly. As soon as the pins 15 move into the slots 14, they snap in and form the above-mentioned stop which prevents further movement of the drawer 2 out of the case 1.

10 As can be seen from Figure 1 and 4, the rear wall 5 of the drawer 2 has ribs 17 which have surfaces 18 that slope downwardly away from the base plate 6. Also, on the inner face of that wall of the case 1 opposite the base plate 6, the case has guide ribs 20. As shown in Figure 3 the distance separating the guide ribs 20 is somewhat greater than the length of the thicker portion of the cassette 4, as measured transversely of the direction of movement of the drawer, which thicker portion is for placing on the second head of a tape apparatus. Also, the dimension a (Figure 4), to the extent of which the guide 20 project from the wall of the cassette 4, is somewhat greater than the dimensional increase b of the thicker portion 21 of the cassette 4, as compared with the rest thereof. As will also be seen from Figure 4, the guide ribs 20 are somewhat shorter than the wall of the case 1, so that they do not extend to its edge. Furthermore, each of the ribs is chamfered at that of its ends disposed near the mouth of the case 1.

35 The guide ribs 20 facilitate introduction of the cassette 4 into the case 1. They hold the cassette 4 at such distance from the wall of the case 1, that the thicker portion 21, when introduced into the case 1, cannot strike the edge of the wall on which the guide ribs 20 are provided. If on the other hand, as shown in Figure 4, the drawer is moved upwards while the container is in the vertical position, the cassette 4 slopes away from the baseplate 6 of the drawer 2 under the effect of the inclined surfaces 18. As this happens, the cassette is supported at the upper ends of the guide ribs 20, with the result that the lower edge of the cassette, presented to the base plate 6, is urged towards the base plate. Thus, the inclination of the cassette, facilitating its removal from the drawer, is increased. Figure 5 shows the position of the cassette in the container when the drawer 2 is pushed into the case 1. In this position, the spring 3 is compressed between the end wall 5 of the cassette and the wall of the case 1.

60 As shown in particular in Figures 1 and 2, catch 19 for holding the drawer 2 in the inner position in the case 1 includes a leaf spring 22 which is formed integrally with the drawer 2 and the flat face of which carries a tooth 23 near its free end, which tooth is for engagement in an aperture 24 in the case. Connected to the tooth is a push button 25 which extends laterally from the leaf spring 22 on

that side thereof remote from the tooth 23 and is disposed in the same plane as the front wall 7 of the drawer 2.

In the present construction, the leaf spring 22, the push button 25 and the tooth 23 are produced integrally with the drawer 2 and are of a plastics material by injection-moulding.

As also shown in Figure 2, the tooth 23 has an inclined face 9. When the drawer 2 is pushed into the case by the application of, for example, finger-pressure to the front wall 7, the spring 22 incorporating the push button 25 is deflected by the inclined surface 9 when the tooth 23 strikes the wall of the case, 1, so that the tooth 23 is able to snap into the incision 24. When the container is to be opened for the purpose of removing or inserting a cassette, all that is needed is to apply finger-pressure to the push button 25. The force that acts laterally on the spring 22 causes the latter to deflect to the right, as viewed in Figure 2, so that the tooth 23 slides out of the incision 24. The drawer 2 can then be moved out of the case 1 by the spring 3 until the pins 15 strike the ends of the slot 14. In this position, illustrated in Figures 3 and 4, the cassette 4 can be removed from the container.

The case of the container shown in Figures 1 to 7 is provided with connecting elements for detachably connecting the container to an adjacent similar container to form a block, these connecting elements taking the form of guide tracks designed to be slid one into the other. As seen from the illustration in the drawing and particularly that of Figure 7, one of the guide tracks takes the form of an elongate projection 26 having side faces 27 chamfered to dovetail form. The projection 26 is intended to be pushed into a recess 28 having a complementary cross-section. The recess 28 and the projection 26 are disposed parallel to the direction of movement of the drawer 2 in the case 1. As shown in Figure 7 the recess 28 is formed in the guide projection 11 on the case 1, this projection serving to guide the drawer 2. Figure 7 illustrates two containers with their cases 1 inter-connected. For the sake of clarity, one of the containers is shown without, a drawer 2 therein. It will be appreciated that not just two, but a large number of containers, can be interconnected in this way.

From the figures described so far it can be seen that the spring 3 is a coil spring with a somewhat flattened cross-section. Instead of using a spring of this shape, a leaf spring could be employed; another possible solution is the insertion of a foam plastics block spring. It is however, preferable to use a normal coil spring of circular cross-section—i.e. a cylindrical coil spring. This necessitates safeguards against buckling of the spring however. Such an arrangement is now described with reference to the Figures 12 to 15.

Figure 12 illustrates a case 1 with the spring 31 but without the drawer, whilst Figure 13 is a cross-section along the line "13" of Figure 15; Figures 14 and 15 are a semi-schematic illustration of the container closed (Figure 14) and opened (Figure 15) drawer. As before, the case 1 has a flanged guide projection 11 whilst the drawer 2 has the corresponding guide slot 10 of complementary shape on its underside. The guide projection 11 is now provided on its surface facing the drawer with a segment-shaped groove 30, on which the cylindrical coil spring 31 is capable of being supported; according to experience such a guide is an adequate safeguard against buckling. As an alternative, or, as in the embodiment illustrated, in addition, it is also possible to provide in the upper side of the case—i.e. in the cover—in the region of the guide tracks 26, a groove or a channel of segmental cross-section for additional lateral support of the spring. Since the guide track which is provided for stacking several containers requires a thickening of the case cover in this region, a decrease in this part of the cross-section of the cover by the groove 32 can be accommodated. The upper groove 32 only extends as far as the rear edge of the portion of the cassette 21 thickened by the dimension b (Figure 15) when the drawer is inserted, so that this guide groove finds sufficient space behind it without the internal width of the housing having to be increased.

Figures 8 to 11 show further possible forms of the drawer catch. Referring to Figures 8 and 9, the spring 22' of the catch 19' is not arranged with its face parallel to the plane of the base plate 6 as in Figure 1, but at right-angle thereto. The mode of operation of the retaining device, which in addition to the spring 22' includes a tooth 23' and a push button 25', is the same as that already described. The tooth 23' is intended to engage in an incision 24' in a case 1' illustrated in Figure 9. The parts 22', 23' and 25' may be made integrally with a drawer 2' in the manner previously described, and are preferably of plastics material.

Figures 10 and 11 illustrate a retaining device 119 in which a spring 122 with a tooth 123 and push button 125 is provided on the case 101, spring, tooth and push button in fact being produced integrally with the case. The drawer 102 movable in the case 101 has a lip 124 having an inclined surface 126 designed to co-operate with the tooth 123. When the drawer is inserted, the inclined surface 126 pushes the tooth 123 away so that the latter can snap into position behind the lip 124. Pressure applied to the button 125 causes the spring 122 to deflect to the left, as seen in Figure 11, so that the tooth 123 releases the lip 124 thus the drawer 102 to enable the latter to move out of the case

101 under the action of a spring, not illustrated.

The Figures 16 to 21 are representations of details concerning the formation and attachment of an index inside the container. In this further development of the invention a number of criteria for such a label are taken into account: it should be simple to introduce into the container both manually and automatically, and also be exchangeable; it should nevertheless be safeguarded against unintentional removal; finally, the container should, in so far as alterations are necessary for accommodation of the label, not be made more expensive in production.

Figure 16 is a semi-schematic plan view of case, drawer and label, the case 1 with the drawer 2 and label 33 inserted in the drawer. The label—it is represented separately in plan view in Figure 19—consists of stiff paper or cardboard, but may also consist, of course, of a flat piece of plastics material. On both sides of the label are imprinted numbered inscription spaces, which on the other side of the label (shown in Figure 20) are upside down in relation to those shown in Figures 16, 19 and 21. The width of the label transverse of the direction of movement of the drawer 2 is smaller than the width of the cassette laying above (not illustrated) so that when the cassette is removed the label is not taken with it.

The drawer is provided with holding lugs 34, 39 which engage over the label and safeguard it from unintentional removal. A first holding lug 34 is injection-moulded to the front wall 7 of the drawer on the inside. It is located above the slot 10 in the base of the drawer and therefore does not hinder the deformation of the drawer in the direction of the base plate 6. The lug 34 has a locking surface 35 facing the label; the distance between the locking surface 35 and the upper side of the base plate 6 is sufficient to accommodate the thickness of the label, which is elastically deformable in the region of a tongue 36 projecting from the front edge of the label. Figure 17 is a cross-section along line "17" in Figure 16, and further illustrates the construction.

The label 33 furthermore possesses two U-shaped notches 37 (Figure 19) so that two more tongues 38 are produced. The notches 37 are guided over the tabs 8 when introducing the label in the drawer, which tabs have already been mentioned above and serve to secure the spools of a cassette placed over the tabs. On each of these tabs 8 a further holding lug 39 is provided which is formed in a similar manner to the lug 34 (see Figure 18) and behind the locking surface 40 of which tongues 38 can project. For the same reason as was given for the lug 34, the lugs 39 are arranged over lateral apertures in the base plate 6.

An inscription on the label may be read from the front if the containers are lying flat (Figure 20); if the container is upright (Figure 21) the label is turned around. The positioning of the label in the drawer is effected substantially by the positive locking between the tabs 8 and the sides of the U-shaped notches 37.

Another solution consists in that the drawer or the rear wall of the drawer only is made transparent; the label then possesses a bent-up side adapted to the dimensions of the rear wall, the inscription of which may be read through the transparent rear wall.

It has already been explained above with reference to Figure 7 how several containers can be stacked. It has now been stated that the central mounting track in a not too large number of containers is adequate; if however, a large number of containers are to be stacked the arrangement which is described in the following with reference to Figures 22 and 23 is recommended.

Figure 22 is a semi-schematic rear view of two containers about to be joined together, whilst Figure 23 is a cross-section along line "23" in Figure 22.

It is possible to see the two cases 1, which each possess on their larger upper external surfaces the main guide track 26 with a dovetail cross-section, and on the underlying large external surface the guide groove 28 which is complementary to the main guide track. Thus far the arrangement agrees with that according to Figure 7. Track 26 and groove 28 do not, however, extend as far as the front edge 41 of the housing; the groove is closed in this region (42 in Figure 23). The same applies to the auxiliary guide tracks 43, 43' with the auxiliary grooves 44, 44' associated therewith, the auxiliary tracks and grooves being shorter than the main tracks 26 and grooves 28. The regions in which the grooves 44, 44' are closed are indicated at 45, 45' in Figure 23. In this manner the joining procedure is simplified because the container to be inserted is first of all laid flat and then only the main track aligned; the positioning of the auxiliary tracks then takes care of itself. The auxiliary tracks all have a half dovetail cross-section with lateral surfaces 47, 47' which are parallel to the dovetail surfaces 27 or 27' of the main guide track. This is therefore particularly advantageous because the moulds are not substantially more complicated for the injection moulding of the housing 1 because the surfaces 47, 47' are parallel to the surfaces 27 or 27'. The same applies to the grooves 28 and 44 or 44'. Also, in the case of the grooves of the auxiliary guide tracks these appear on the underside of the housing as closed areas 45, 45'. Together with the area 42 they form stops which limit the introduction movement of the two housings 1 relative to one another. Additional

space is not claimed by the auxiliary grooves, since the cassette 21, on account of the height required for the drawer base 6, leaves free marginal sections inside the case which are thus utilised.

In order to prevent unintentional release of the stacked containers, projections 46 are provided which, owing to their slope, elastically deform the base of the case during stacking, but then spring into the apertures 14 which, as mentioned above (Figure 1, 3, 6) are accommodated in the base of the housing as stops for the drawer.

Figures 24 to 26 illustrate how a block formation is made possible by joining together several containers laterally. Corresponding cases 1 are shown in Figure 24 at the moment of joining together, in Figure 25 in rear view, and in Figure 26 in perspective view.

The case shape according to Figure 22, 23 is supplemented here by similar joining tracks and receiving grooves on the narrow sides of the case which extend parallel to the direction of movement of the drawer. What was stated with respect to the main guide tracks 26 and the auxiliary guide tracks concerning length similarly applies to these elements.

The narrow sides 50, 50' of the cases are provided with a dovetail-section guide tracks 51 and with a receiving guide groove 52 complementary to the latter. Tracks and grooves begin on the rear edges 57 and 57' but do not extend fully to the front edges 53, 53', so that in the block formation only straight continuous lines 54 between the individual containers are visible; at the same time the end edge 55 of the track 51 forms a stop which co-operates with the end edge 56 of the respective groove.

Safety means similar to the projections 46 in Figure 22 and 23 may also be provided here as a safeguard against unintentional removal. These safety means with associated apertures are not illustrated again in Figure 24 to 26 however.

It is possible to see in Figure 26 how a container (above left) is introduced into an already formed block by introduction from the front.

If a block of a plurality of containers has to be securely mounted in a motor vehicle, a boat, or the like, it is advantageous to make use of a mounting bracket, details of which are explained in the following with reference to Figure 27 to 30.

Each of the containers forming the container block according to Fig. 28 to 30 has in its case 1 the main tracks 26 and auxiliary guide tracks 43, 43' arranged on the upper side on the underside of each container case 1 are the guide grooves complementary to the tracks 26, 43, 43', which grooves cannot be seen in the Figures 27 to 30. By this means the individual containers are joined

together to form a block of optional height.

To mount this block, for example on a flat horizontal, vertical or even inclined surface, the right-angle bracket 60 is used. The sides have slide-in guides on the underside of the limb 61, grooves which are of a complementary shape to the guides 26—43—43', whilst the limb 62 has similar slide-in guide tracks 26', 43'. On using the limb 61 as a mounting the arrangement shown in Figure 28 is produced, whereas if the limb 62 is used, the upright mounting according to Figure 29 is produced.

Both limbs also have mounting holes 63 by means of which the one limb can be screwed onto a surface (Figure 29) if the other limb is engaged with a container block. If the holes 63 have chamfers for counter-sunk screws the side engaged with the block can itself accommodate screws.

Figure 30 shows that the mounting bracket may have alternative proportions; in this illustration a container block of two by four containers is illustrated, which block is mounted by a mounting bracket 64 with double sets of slide-in guides. Just as one of the brackets 60, 64 may be used in mounting a container block, it is conversely also possible to use the guide tracks on the upper-most container case of a block to attach a handle for carrying, by means of which a block of containers can be carried conveniently without necessitating a case, bag or the like. This is shown in Figures 31 to 33. Figure 31 shows how a handle formed like a cut away box is pushed onto a container block 70; the handle naturally has the receiving grooves for the main and auxiliary guide tracks 26 and 43, 43' of the upper-most container. For carrying, the user gets hold of the handle as shown in Figure 32. In the case of a block 73 of double width, a handle 72 of double width is similarly used, according to Figure 33. It will be clear that different forms of handle are conceivable.

The Figures 34 to 36 show that it is also possible to produce a "large container" according to the invention which accommodated more than one drawer. The drawers may be arranged one on top of the other in compartments (Figure 34), above and next to one another (Figure 35) or finally back to back (Figure 36); clearly the possibilities according to the two last-mentioned figures may be combined.

Nevertheless, the large container can also be extended by the above-mentioned slide guides in that individual containers or large container may be pushed on. It should be mentioned here that in the instance of the container according to Figure 25, for two compartments lying next to each other only one main and two auxiliary tracks are provided; this container can therefore also be extended only by double containers with complementary receiving grooves.

The invention provides a container for cassettes, especially recording-tape cassettes, which can be handled in an extremely convenient manner. As seen from Figures 1 and 3, the base plate 6 is substantially narrower than the cassette 4 placed thereon. The sides of the drawer are therefore omitted so that the cassette can be readily gripped at the sides with two fingers or with finger and thumb, so that no change of grip is required for insertion into the play-back apparatus. Insertion of the drawer into the container by the application of pressure to the front wall 7, and the moving of the drawer 2 from the container by pressure on the push button 25 enable the container to be handled in a simple manner in practically all circumstances, for example in a car, and in all positions of the container. The container consists of two parts made of plastics material and of a spring. The parts of plastics material are so shaped that they can be produced in simple operations and with simple moulds by injection-moulding.

WHAT WE CLAIM IS:—

1. A container for a tape cassette, the container comprising a drawer slideably mounted in a case for movement between an outer open position in which a cassette can be placed in or withdrawn from the drawer and an inner closed position, biasing means biasing the drawer towards the open position, stop means defining the open position, and releasable catch means for holding the drawer in the closed position, the sides of the drawer being at least partially cut away so that a cassette contained in the drawer can be grasped and removed therefrom.

2. A container according to Claim 1, wherein the drawer comprises a front wall and a rear wall interconnected by a base plate.

3. A container according to Claim 2, wherein the front wall of the slide drawer serves to close off a narrow side of the case.

4. A container according to Claim 2 or Claim 3, wherein the base plate is provided with a slot which extends in the direction in which the drawer is movable and in which engages a guide projection on the case for guiding the drawer.

5. A container according to Claim 2, wherein the rear wall of the drawer has at least one inner surface which slopes away from the base plate and wherein the case is provided, on the inner face of the wall opposite the base plate, with guide ribs which extend in the direction of movement of the drawer and which are arranged to provide locations for a cassette disposed on the container.

6. A container according to Claim 1 or 2, wherein the drawer and the case are provided with an inter-engaging pin and slot, the slot extending in the direction of movement of the drawer, and the ends of the slot forming



together to form a block of optional height.

To mount this block, for example on a flat horizontal, vertical or even inclined surface, the right-angle bracket 60 is used. The sides have slide-in guides on the underside of the limb 61, grooves which are of a complementary shape to the guides 26—43—43', whilst the limb 62 has similar slide-in guide tracks 26', 43'. On using the limb 61 as a mounting the arrangement shown in Figure 28 is produced, whereas if the limb 62 is used, the upright mounting according to Figure 29 is produced.

Both limbs also have mounting holes 63 by means of which the one limb can be screwed onto a surface (Figure 29) if the other limb is engaged with a container block. If the holes 63 have chamfers for counter-sunk screws the side engaged with the block can itself accommodate screws.

Figure 30 shows that the mounting bracket may have alternative proportions; in this illustration a container block of two by four containers is illustrated, which block is mounted by a mounting bracket 64 with double sets of slide-in guides. Just as one of the brackets 60, 64 may be used in mounting a container block, it is conversely also possible to use the guide tracks on the upper-most container case of a block to attach a handle for carrying, by means of which a block of containers can be carried conveniently without necessitating a case, bag or the like. This is shown in Figures 31 to 33. Figure 31 shows how a handle formed like a cut away box is pushed onto a container block 70; the handle naturally has the receiving grooves for the main and auxiliary guide tracks 26 and 43, 43' of the upper-most container. For carrying, the user gets hold of the handle as shown in Figure 32. In the case of a block 73 of double width, a handle 72 of double width is similarly used, according to Figure 33. It will be clear that different forms of handle are conceivable.

The Figures 34 to 36 show that it is also possible to produce a "large container" according to the invention which accommodated more than one drawer. The drawers may be arranged one on top of the other in compartments (Figure 34), above and next to one another (Figure 35) or finally back to back (Figure 36); clearly the possibilities according to the two last-mentioned figures may be combined.

Nevertheless, the large container can also be extended by the above-mentioned slide guides in that individual containers or large container may be pushed on. It should be mentioned here that in the instance of the container according to Figure 25, for two compartments lying next to each other only one main and two auxiliary tracks are provided; this container can therefore also be extended only by double containers with complementary receiving grooves.

The invention provides a container for cassettes, especially recording-tape cassettes, which can be handled in an extremely convenient manner. As seen from Figures 1 and 3, the base plate 6 is substantially narrow than the cassette 4 placed thereon. The sides of the drawer are therefore omitted so that the cassette can be readily gripped at the sides with two fingers or with finger and thumb, so that no change of grip is required for insertion into the play-back apparatus. Insertion of the drawer into the container by the application of pressure to the front wall 7, and the moving of the drawer 2 from the container by pressure on the push button 25 enable the container to be handled in a simple manner in practically all circumstances, for example in a car, and in all positions of the container. The container consists of two parts made of plastics material and of a spring. The parts of plastics material are so shaped that they can be produced in simple operations and with simple moulds by injection-moulding.

WHAT WE CLAIM IS:—

1. A container for a tape cassette, the container comprising a drawer slideably mounted in a case for movement between an outer open position in which a cassette can be placed in or withdrawn from the drawer and an inner closed position, biasing means biasing the drawer towards the open position, stop means defining the open position, and releasable catch means for holding the drawer in the closed position, the sides of the drawer being at least partially cut away so that a cassette contained in the drawer can be grasped and removed therefrom.

2. A container according to Claim 1, wherein the drawer comprises a front wall and a rear wall interconnected by a base plate.

3. A container according to Claim 2, wherein the front wall of the slide drawer serves to close off a narrow side of the case.

4. A container according to Claim 2 or Claim 3, wherein the base plate is provided with a slot which extends in the direction in which the drawer is movable and in which engages a guide projection on the case for guiding the drawer.

5. A container according to Claim 2, wherein the rear wall of the drawer has at least one inner surface which slopes away from the base plate and wherein the case is provided, on the inner face of the wall opposite the base plate, with guide ribs which extend in the direction of movement of the drawer and which are arranged to provide locations for a cassette disposed on the container.

6. A container according to Claim 1 or 2, wherein the drawer and the case are provided with an inter-engaging pin and slot, the slot extending in the direction of movement of the drawer, and the ends of the slot forming



- stops for the pin for the purpose of limiting movement of the drawer.
7. A container according to Claim 6, wherein the pin has at its forward end an inclined surface which facilitates introduction of the drawer into the case.
8. A container according to Claim 2, wherein the base plate is provided with tabs for engagement in openings in the winding cores of a cassette.
9. A container according to Claim 1, wherein the catch means includes a leaf spring extending in the direction of movement of the drawer and having at or near its free end a tooth arranged to engage a detent or recess, there also being provided a push button by means of which the tooth can be disengaged from the detent or recess.
10. A container according to Claim 9, wherein the leaf spring, the push button, and the tooth are integral with the drawer or the case.
11. A container according to Claim 9, wherein the leaf spring, the push button and the tooth are integral with the drawer and the detent is formed by an aperture in the case.
12. A container according to Claim 1, wherein the case has guide tracks designed to slide into other tracks for the purpose of detachably connecting the container to an adjacent like container to form a block.
13. A container according to Claim 12, wherein the guide tracks are of dovetail form.
14. A container according to Claim 1, wherein the biasing means is a coil spring formed about a notional core of elongate cross-section.
15. A container according to Claim 1, wherein the biasing means is a cylindrical coil spring and the case has spring guides to prevent the spring from buckling.
16. A container according to Claim 4, wherein a spring guide groove of segmental cross-section is accommodated within the drawer guide projection on the case.
17. A container according to Claim 12 or Claim 13, wherein a spring guide groove of segmental cross-section is accommodated within the said guide tracks.
18. A container according to Claim 1, having a label which can be inserted into the drawer in such manner as to be guarded against unintentional removal.
19. A container according to Claim 18, wherein the label is made of stiff flat material and has two resilient tongues which can be snapped in under holding lugs provided on the drawer.
20. A container according to Claim 18, wherein matter printed on one surface of the label is repeated upside down on the other side of the label.
21. A container according to Claim 12 or Claim 13, wherein auxiliary guide tracks are provided close to the edges of the case and parallel to the main guide tracks.
22. A container according to Claim 21, when appendant to claim 12, wherein the main guide tracks are of dovetail cross-section and the auxiliary guide tracks are of half dovetail cross-section.
23. A container according to Claim 21 or Claim 22, wherein the tracks do not extend over the whole length of the case.
24. A container according to any of Claims 21 to 23, wherein the auxiliary tracks are shorter than the main tracks.
25. A container according to any of Claims 12, 13, 21, 22, 23, 24, wherein the guide tracks extend from the rear edge of the case and stop short of the front edge.
26. A container according to Claim 6, wherein to facilitate rigid stacking of containers locking pins are provided on the case for engaging an end of the said slots.
27. A container according to any preceding Claim, wherein further guide tracks are provided in the narrow sides of the case which extend parallel to the direction of movement of the drawer.
28. A container according to Claim 27 wherein the further guide tracks extend from the rear edge of the case and stop short of the front edge.
29. A container according to any of Claims 12, 13, 21, 22, 23, 24, 25, provided with a mounting bracket having guide tracks adapted to engage at least some of the guide tracks on the case.
30. A container according to any of Claims 12, 13, 21, 22, 23, 24, 25, provided with a carrying handle adapted to engage at least some of the guide tracks on the case.
31. A container according to Claim 1, wherein the case is formed in one piece to accommodate several drawers arranged above, next to or behind one another.
32. A tape cassette container substantially as herein described with reference to and as illustrated in Figures 1 to 7 of the accompanying drawings.
33. A tape cassette container according to Claim 15 but incorporating a catch substantially as herein described with reference to Figure 8 of the accompanying drawings.
34. A tape cassette container according to Claim 15 but incorporating a catch substantially as herein described with reference to Figures 10 and 11 of the accompanying drawings.
35. A tape cassette container substantially as herein described with reference to Figures 12 to 14 of the accompanying drawings.
36. A tape cassette container substantially as herein described with reference to Figures 16 to 21 of the accompanying drawings.
37. A tape cassette container substantially as herein described with reference to Figures 22 and 23 of the accompanying drawings.

38. A tape cassette container substantially as herein described with reference to Figures 24 to 26 of the accompanying drawings.

5 39. A tape cassette container and mounting bracket substantially as herein described with reference to Figures 27 to 29 or to Figure 30 of the accompanying drawings.

10 40. A tape cassette container and carrying handle substantially as herein described with reference to Figures 31 and 32 or to Figure 33 of the accompanying drawings.

41. A tape cassette container substantially as herein described with reference to Figure 34 or Figure 35 or Figure 36 of the accompanying drawings.

15

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