Description

The invention relates to a display device for the seating and exhibition of stiff, flat objects, such as records or magnetic tape cassettes, in an arrangement one behind another, comprising a base and, at a distance above this base and between two lateral boundary members, means disposed one behind another for supporting and pivotally seating the single objects, which are thereby pivotal to and fro between a backwardly inclined, substantially upright oblique position and a forwardly inclined, substantially upright oblique position, the means for supporting and pivotally seating a single object being formed by a pair of transversely extending, mutually parallel holding rods, which are disposed at such spacings in each pair and are adapted in their cross-sectional dimensions and in their distance from the base to the thickness and height of the objects in such a manner that these objects, in the inclined, oblique posiiton, each bear simultaneously with their front face and rear face below their centres of gravity against the two adjacent holding rods.

Nowadays music (audio) cassettes, films (video) cassettes, and record cassettes, more particularly CD (compact disc) cassettes, are frequently exhibited in display stands in which the cassettes are held one above the other, and can more particularly be locked in compartments. These known stands, however, occupy a relatively large amount of space, but can hold relatively few cassettes.

On the other hand, conventional records in their cardboard covers are often exhibited in shops in box-like containers. When stored in this manner the records, which are thin objects, can be "leafed through" like cards in a card-index box. In the case however of the aforementioned tape and CD cassettes, this method of holding is disadvantageous without further adaptation, owing to their greater

thickness (e.g. 1 cm or more) relative to their height and width, or may be impossible since the cassettes slip and are damaged.

As can be seen e.g. from US-A-3 784 269, US-A-3 446 360, FR-A-2 130 788, FR-A-2 127 857 and GB-A-2 005 226 (or the corresponding FR-A-2 401 703) one method of holding even thicker objects such as audio cassettes pivotably in a display device, is thought to consist in providing these objects with separate holders for supporting and pivotably bearing them, the holders being pivotably mounted in the device and holding the articles. The holders can be in the form of troughs or brackets, with pins or the like pivotably received in corresponding recesses inside walls, or can be box-like, their narrow sides being formed with bearing projections which engage in corresponding recesses in side walls. These solutions, however, are obviously complicated and expensive to construct, and also these known holders prevent efficient use of space, as is desirable in order to hold the maximum number of objects.

DE-B-715 042 also discloses a drawer system for holding files, folders, index cards or other written material, the device being divided by supporting rods extending at intervals from one another and parallel to one another, horizontally between two vertical walls. The supporting rods co-operate with abutments on the base of the drawer, in order to support the written material substantially without slipping, in a backwardly inclined oblique position, if required together with a plate for supporting the written material. This kind of support, however, is suitable only for thin objects in the form of leaves or cards, the number of objects belonging together being kept in a "compartment" formed between two adjacent supporting rods, and the objects can be leafed through only to a restricted extent. If the objects in a compartment are pivoted forward, individually or in groups, from their backwardly-inclined normal oblique position, they have to be held in the forward position by hand. Also, when the objects are bent over or "leafed" in this

manner, they cannot be reliably prevented from slipping; on the contrary the lower edges of the object can slip relatively easily out of the grooves formed between the abutments, particularly when a compartment contains rather few objects, and they may even slide under a supporting rod into another compartment. This applies even more when the objects are thicker.

A similar card-index box with separate supporting plates for holding the material is also known from DE-U-1 395 202. Here also, as in the previously-described drawer system, the supporting plates bound compartments in which the written material is kept sorted, resting on the supporting plates. The plates are held by pairs of spaced-apart rods disposed horizontally at the base of the box, the bottom edge of each supporting plate being inserted between a pair of rods. The plates can therefore move through an angle forwards and backwards. However, the bottom edges of the plates have to be offset on both sides, and the offset edges rest on horizontal strips provided along the two side walls of the box and constituting the base for the articles being held, i.e. support the articles. Admittedly it is mentioned in DE-U-1 395 202 that the offset in the supporting plate is not essential, but in that case the two strips along the side walls of the box must be omitted, and consequently the pairs of rods for supporting the plates will be an obstacle preventing the material in the compartments from resting on the supporting plates. In this case also, the material, e.g. card-index cards, cannot be leafed through unless allowed to slip in conventional manner, as described hereinbefore in the case of conventional records received in conventional box-like containers. As before, there is no individual pivot bearing for the material being held.

The object of the invention therefore is to construct a simple device of the initially-mentioned kind, in which a number of rigid flat objects, more particularly cassettes, can be held and shown to customers, with efficient use of space and enabling the cassettes or

similar rather thick objects to be "leafed through" without the objects slipping and being damaged.

To this end, the device of the initially-mentioned kind according to the invention is characterised in that all the holding rods are at the same spacing from one another, so that any two mutually adjacent holding rods constitute a pair for seating one object, and that, where one object is pivoted into the forwardly inclined oblique posiiton and the next succeeding object is pivoted into the backwardly inclined oblique position, the lower edges of these objects do not interfere with each other. In this construction the holding rods serve a number of purposes. They directly support the objects on display, more particularly the aforementioned cassettes, at the front and at the rear. Since only the lower region of the objects is held, they can be inspected without hindrance. The rods also separate the objects so that they do not abut one another. The rods also prevent the objects from slipping relative to one another and provide them with an individual swivel bearing, enabling them to be "leafed through" in a simple and therefore safe manner, like a card-index box. The objects are supported in an oblique position at an inclination which varies depending on the distance between the holding rods relative to the thickness of the objects. In each inclined position, the objects are held by a rod both at the front and at the back, and are therefore prevented from tipping out. Of course, the bottom edges of the objects rest on the base and, regarded in cross-section, the object can be considered to have a kind of three-point support.

In the device according to the invention, the base can be continuous in the form of a plate, or alternatively can be discontinuous and more particularly can simply comprise two longitudinal edge strips. Advantageously in this case, particularly for manufacturing reasons, the base is formed of horizontal flanges of angle profiles constituting the lateral boundary members.

The holding-rod cross-section can e.g. be rectangular, more particularly square, with rounded corners, or alternatively can be oval. Particularly when the holding rods have a circular cross-section, the objects can advantageously slide or roll on the holding rods when leafed through or pivoted.

The holding rods can be permanently secured to the lateral boundary members, e.g. by riveting. It has been found, however, that when the objects are "leafed through", in the last phase during pivoting, the objects are supported particularly advantageously if the holding rods are rotatably mounted in the lateral boundary members. When the objects are pivoted, the holding rods can if required be twisted slightly, when the front or back region of the objects which comes to bear against them is different from in the previously pivoted position, so that the object can be particularly gently treated.

Music cassettes in particular are relatively narrow, and it is therefore desirable to save space by disposing a number of cassettes or similar objects side by side in a row in the device. In that case "leafing through" the object is somewhat complicated if a row of objects, e.g. five side by side, have to be pivoted individually. In this case the holding rods provided near the base offer a simple possibility of improving the manipulation. Advantageously therefore according to the invention, pivot elements projecting upwards from the holding rods are mounted on the holding rods, which elements extend substantially over the length of the holding rods or width of the device. The pivot elements, e.g. pivoting stirrups, plates or the like, form a sort of cam in order simultaneously to pivot a row of cassettes disposed side by side.

In order substantially to simplify assembly of the device, according to another advantageous feature the pivot elements are firmly connected to the rotatably mounted holding rods. More particularly it is also advantageous for the same reason, if the pivot elements

are formed in one piece with the rotatably mounted holding rods. In these embodiments the holding rods and pivot elements are inserted between the lateral boundary members in a single operation. On the other hand it may also be advantageous for manufacturing reasons if the pivot elements are separate components, which are pivotably mounted on the holding rod. This embodiment is particularly required when the holding rods are permanently mounted.

A particularly advantageous embodiment of the device according to the invention is also characterised in that the pivot elements, constructed as a pivoting stirrups, possess substantially the form of a "T" or of an inverted "U" or "L", the upwardly situated, horizontal member possessing the same thickness as the holding rods in order to form a spacer element between the objects. In this embodiment, which is also characterised by little use of material and small size, the horizontal members of the pivoting stirrups also serve as spacer elements, which additionally hold the object aligned exactly parallel to one another.

Advantageously also, the pivot elements form insertion compartments for price tags, publicity cards or the like. The insertion compartments can e.g. hold tags giving information about the nature and origin of the objects on display (e.g. headings such as "operas" or "orchestral works", giving the composer's name).

In order additionally to simplify "leafing through" it is also advantageous if a handle is provided on each of the pivot elements. The handle can e.g. be in the form of plate-like projections or wide portions, flap-like extensions or eye-like bends in an upper corner region of the pivot elements.

If the pivot elements are plates, they can similarly be portions of extruded section members or injection-moulded parts. In the case of pivoting stirrups, they or their parts are likewise e.g. portions of

extruded section members, which are assembled in the required shape. Alternatively they can be made of wire.

The invention will now be explained in detail with reference to the embodiments shown in the drawings, in which, in detail:

Fig. 1 is a cross-section through a device for holding or exhibiting "compact disc" cassettes;

Fig. 2 is a longitudinal section through the device along line II-II in Fig. 1;

Fig. 3 is a cross-section through a variant device for holding and displaying music cassettes;

Fig. 4 is a longitudinal section through the device along line IV-IV in Fig. 3, and

Fig. 5 is a partial longitudinal view similar to Fig. 4 but on a larger scale, showing a detail of the device and illustrating how an insertion compartment is formed by a pivoting stirrup and an associated holding rod.

Figs. 1 and 2 show a drawer-like device 1 for holding and exhibiting "compact disc" (CD) cassettes. The device shown can be secured e.g. to a shelf compartment or frame or a separate drawer, though this is omitted from the drawing for simplicity. Device 1 has two longitudinal angle profiles 2, 3 having horizontal bottom flanges 4, 5 defining a base 6, which is interupted in the present case. The bottom edges of CD cassettes 7, indicated by chain lines in Figs. 1 and 2, rest on base 6. In order to hold the CD cassettes 7 in a forwardly or backwardly inclined position as in Fig. 2, holding rods 10 are provided and extend transversely between the vertical flanges 8, 9 of angle profiles 2, 3. Rods 10 have a circular cross-section and smaller-diameter end portions which are inserted and rotatably mounted in corresponding bores in the lateral boundary members or lateral cheeks formed by the vertical flanges 8 and 9.

As shown more particularly in Fig. 2, the spacing between rods 10 is made such that the CD cassettes 7 can be obliquely positioned. In each case the front sides of cassettes 7 abut a front holding rod 10 and the rear sides abut a rear rod 10 and are thus supported. The angle of inclination of cassettes 7 depends of course on the ratio of the spacing to the thickness of CD cassettes 7. Rods 10 are also disposed at a distance from base 6 such that cassettes 7 cannot tip out between two holding rods 10 when in the inclined position, i.e. each cassette 7 always abuts two rods 10 irrespective of whether it is in the forwardly tipped oblique position or in the normally-assumed backwardly inclined position. Accordingly, the minimum height of rods 10 above base 6 is adapted to the spacing between rods 10 or the thickness of cassettes 7. On the other hand, as can also be seen directly, the height of rods 10 above base 6 is limited by the fact that there must be no interference between the bottom edges, resting on the base, of any two cassettes 7 if one is

tilted forwards and the other is tilted backwards. The maximum height depends inter alia on the thickness of rods 10 and the chosen angle of inclination. Rods 10 must not be made too thick, since the aim is to waste minimum space and accommodate the maximum number of cassettes. On the other hand, of course, rods 10 must not be too thin, since in that case there may be interference between the bottom edges of two cassettes 7 tilted in opposite directions. The spacings and sizes can be directly determined in each particular case in accordance with the stored objects, the only important thing being the aforementioned clamping of cassettes 7 between rods 10 or the "three-point support" as described. In the case for example where the stored compact-disc cassettes are about 10 mm thick, it has been found advantageous for the axes of rotation of the holding rods to be disposed 9 mm above the base, the internal spacing between the rods being 13 mm and the rod diameter being 4 mm.

In order to combine the two angle profiles 2, 3 to form a stable construction, a transverse ledge 11 is disposed at the front and also at the rear end of device 1 (only the front transverse ledge 11 is shown in Fig. 2). In the present embodiment, the ledges are constructed as angle profiles and permanently secured to the longitudinal angle profiles 2 and 3, e.g. by sticking or welding, to produce a sort of frame structure. If required, front plates or ornamental plates can be secured to ledges 11, e.g. by sticking or screwing as diagrammatically indicated by chain-dotted lines at 12' in Fig. 2.

As shown more particularly in Fig. 2, the retaining means formed by rods 10 make it easy to "leaf through" the cassettes 7, i.e. tilt them forwards and backwards and look at them when stored in device 1, without the cassettes 7 slipping or falling back. When the desired cassette 7 has been found it can easily be taken out

of the device either by the customer or by the sales person. If device 1 is disposed at a place which cannot be seen by the sales staff, it is also possible e.g. to keep empty cassettes 7 in device 1 separately from the associated compact discs, which are kept at a counter or at the cash-till.

Figs. 3, 4, 5 show an embodiment for holding and exhibiting music cassettes 17. As shown in Fig. 6, groups of cassettes 17 are disposed side by side in a row. This embodiment has a solid base 6 having longitudinal side edges from which lateral cheeks or boundary members 12, 13 project; as before, the boundary members can be angle-profile sections. Alternatively, of course, the illustrated embodiment comprising lateral cheeks 12, 13 secured to base 6 could be replaced by a one-piece U-section member.

Holding rods 10 are rotatably mounted in side cheeks 12, 13 at constant spacings as before. The ends of rods 10 are mounted in corresponding bores in cheeks 12, 13 and can be secured against axial displacement e.g. by tubular rivets 14 from the exterior, as shown on the right side of Fig. 3. Alternatively, rods 10 can simply be prevented from axial displacement by side cheeks of the drawer, as diagrammatically shown by chain lines on the left side of Fig. 3. This method of preventing axial longitudinal displacement applies particularly when the device is incorporated in a drawer, box or the like or in a shelf compartment with partitions.

Pivot elements in the form of pivoting stirrups 16 are secured to rods 10. In the present embodiment, stirrups 16 are secured to rods 10 by welding or sticking. Alternatively, stirrups 16 and rods 10 can be constructed in one piece, or the stirrups can be pivotably mounted on rods 10, e.g. in sleeves. Pivot mounting

of this kind is particularly necessary when rods 10 are not rotatable but permanently secured in the lateral cheeks.

In the present embodiment, each stirrup 16 has two lateral arms 18, 19 which are adjacent the respective holding rod 10 and connect a horizontal web part 20 to it. Of course, as an alternative to the illustrated embodiment, only one connecting arm could be provided e.g. in the middle, but an embodiment having a number of connecting arms (e.g. two as shown) is recommended for reasons of stability. Instead of the pivoting stirrups shown, the pivot elements could e.g. be bearing plates having substantially the same outline as the pivoting stirrup shown in Fig. 3. Consequently there is no need to show these pivoting plate-like elements in the drawings, particularly since the purpose served is of course the same in both cases, i.e. simultaneous "leafing through" all cassettes 17 in a row, using the pivot elements. With reference to their use for "leafing through", the pivot elements 16 could also be called "turn-over plates".

In the embodiment in Figs. 3, 4 and 5 the web part 20 has a circular cross-section having the same diameter as rods 10, so that web part 20 serves as an additional spacer element between the cassettes 17 inclined in one direction and already held in a parallel arrangement by rods 10. Also, web 20 and rod 10 can be used to form a drawer compartment as shown as 21 in Fig. 4; to this end, web 20 and rod 10 are formed with respective aligned facing slots 22, 23 (compare Fig. 5) for laterally inserting a plate or the like giving information about the cassettes inside, e.g. their nature and price. A plate of this kind is diagrammatically indicated by chain lines at 24 in Figs. 4 and 5.

In order to help pivot a row of cassettes 17 using the stirrup 16, stirrup 16 has a handle 25 at its top corner, e.g. in the form of a plate-like widening of web part 20 or a projecting flap. Alternatively web 20 could be hooked or bent into an eye to form the handle 5 at the indicated place.

The invention has been described in detail with reference to preferred embodiments, but of course other variants and modifications are possible within the invention. For example, as mentioned, rods 10 could depart from the illustrated circular cross-section, e.g. by having an oval or rectangular cross-section, and as likewise mentioned could also be permanently secured to the lateral boundary members. In Figs. 3 and 4 the base 6 could be perforated, e.g. in the form of a lattice or grid, and conversely the device in Figs. 1 and 2 could have a solid baseplate. Also, the lateral boundary members, e.g. 8 and 9, can extend upwards to beyond the height of the stored objects, more particularly cassettes, in which case a closing cover could be attached to give protection against dust outside working hours.

The holding rods 10 are preferably made of steel wire material, whereas the various angle profiles described are preferably portions of aluminium extruded sections. In order to prevent rods 10 from axial displacement in the lateral boundary members if no stepped end portions or tubular rivets are provided, plastics sheets, plates or strips can be stuck to the outside of the lateral boundary members at the level of the bores in which the ends of the holding rods are received.

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Claims

1. Display device for the seating and exhibition of stiff, flat objects (7; 17), such as records or magnetic tape cassettes, in an arrangement one behind another, comprising a base (6) and, at a distance above this base and between two lateral boundary members (8, 9), means (10) disposed one behind another for supporting and pivotally seating the single objects (7; 17), which are thereby pivotal to and fro between a backwardly inclined, substantially upright oblique position and a forwardly inclined, substantially upright oblique position, the means (10) for supporting and pivotally seating a single object (7; 17) being formed by a pair of transversely extending, mutually parallel holding rods (10), which are disposed at such spacings in each pair and are adapted in their cross-sectional dimensions and in their distance from the base (6) to the thickness and height of the objects (7; 17) in such a manner that these objects, in the inclined, oblique position, each bear simultaneously with their front face and rear face below their centres of gravity against the two adjacent holding rods (10), characterized in that all the holding rods (10) are at the same spacing from one another, so that any two mutually adjacent holding rods constitute a pair for seating one object, and that, where one object is pivoted into the forwardly inclined oblique position and the next succeeding object is pivoted into the backwardly inclined oblique position, the lower edges of these objects do not interfere with each other.

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2. Device according to Claim 1, characterized in that the base (6) is of interrupted form.

3. Device according to Claim 2, characterized in that the base (6) is formed of horizontal flanges (4, 5) of angle profiles (2, 3) constituting the lateral boundary members (8, 9).

4. Device according to one of Claims 1 to 3, characterized in that the holding rods (10) are rotatably seated in the lateral boundary members (2, 3; 12, 13).

5. Device according to one of Claims 1 to 4, characterized in that pivot elements (16) projecting upwards from the holding rods (10) are mounted on the holding rods, which elements extend substantially over the length of the holding rods (10) or width of the device (1).

6. Device according to Claim 5, characterized in that the pivot elements (16) are firmly connected to the rotatably mounted holding rods (10).

7. Device according to Claim 5, characterized in that the pivot elements (16) are formed in one piece with the rotatably mounted holding rods (10).

8. Device according to Claim 5, characterized in that the pivot elements (16) are pivotally journalled on the holding rods (10).

9. Device according to one of Claims 5 to 8, characterized in that the pivot elements (16), constructed as pivoting stirrups,

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possess in elevation substantially the form of a "T" or of an inverted "U" or "L", the upwardly situated, horizontal member (20) possessing the same thickness as the holding rods (10) in order to form a spacer element between the objects (17).

10. Device according to one of Claims 5 to 9, characterized in that the pivot elements (16) form insertion compartments (21) for price tags, publicity cards or the like (24).

11. Device according to one of Claims 5 to 10, characterized in that a handle (25) is provided on each of the pivot elements (16).