

SPECIFICATION

Picture Storage Box and Viewer Device

The invention relates to a picture storage box and viewer device having a picture change mechanism for changing the picture displayed.

- Such devices as have been proposed hitherto are constructed as follows. In a shallow housing having a viewing window that is covered, if desired, by a transparent plate, there is a pile of pictures, the uppermost one of which is exposed to view through the viewing window and is supported at its edges. A spring biased pressure arrangement urges the pile upwards against the window or the frame thereof. At one side the housing has an aperture through which a slider member may be pulled out; the withdrawal movement of the slider member being limited by stops. Near to the housing aperture there is arranged a member referred to here and hereinafter as a separator which covers this aperture transversely and at the top and the bottom leaves clear a narrow slot for a picture to pass through. As the slider member is pulled out, the uppermost picture is pulled by a hook-like transporter through the top slot, the remainder of the pile being supported against the separator; and during the return stroke of the slider member the picture is pushed through the bottom slot and under the pile again, or more accurately, between the pressure arrangement and the bottom-most picture of the pile. The second uppermost picture now lies in front of the viewing window and the procedure can be repeated as often as desired to change the displayed picture.
- The spring pressure arrangement serves not only to position the uppermost picture against the viewing aperture; a comparatively low force would be sufficient for that. It must also, however, ensure that the hook-like transporter engages properly even when the pictures of the pile are deformed, spoiled and arched. The forces to be applied are therefore considerable.

- This makes the change-over mechanism not only awkward to use but also results in a stress on the pictures which for photographs, for example, may lead to damage. The uppermost picture is clamped between the window or the window frame and the second uppermost picture and slides on both as the pressure arrangement is pulled out, and the picture is likewise subjected to considerable sliding friction when reinserted. Furthermore, the picture is crushed end on and thus compresses in the longitudinal direction which is troublesome, particularly during the re-insertion procedure, as the picture is not supported by the pile at the time.

It is an object of the invention to provide an improved device of this type in which the disadvantages described above are reduced.

- According to the present invention there is provided a picture storage box and viewer device having a housing with a viewing window for accommodating a pile of pictures, the uppermost picture of which faces the viewing window, the

- device having a slider member that may be displaced between limiting stops in a sliding movement parallel to the viewing window through an aperture arranged in one side of the housing in and out of the housing, a pressure arrangement to press the pile of pictures against the viewing window and a picture change mechanism including a transporter arranged to co-operate with the slider member in order that as the slider member is pulled out a picture on one side of the pile is removed from the pile, and this picture is re-inserted on the other side of the pile as the slider member is re-inserted, wherein there is provided a device, operated by said sliding movement, for disabling the pressure arrangement.

- In the invention, although the pressure arrangement will always be effective during the picture viewing, during the critical stages of the picture change it is disabled and thus the damage to the surface of the picture caused by friction, especially when dust is present, is correspondingly reduced; the crushing of the pictures can likewise be reduced to a minimum. The awkwardness is also avoided.

- The pressure arrangement can be disabled for the duration of the entire slider member movement, with the exception of the end position thereof, but as a general rule it is sufficient for the disabling to be effected only during the return stroke. Provision is made for this last variation whenever the change-over operation necessitates the pressure arrangement being operative during a large part of the withdrawal movement of the slider member.

- It is especially advantageous when the disabling device can be used at least partially to disable the pressure arrangement selectively from the outside, regardless of the change-over operation, for instance for the dispatch of still damp, sensitive pictures (photographic prints), for storage purposes and for changing the complete pile. With one manipulation the function can be changed from that of a change-over picture viewer to a storage arrangement which operates without pressure.

- The device may be provided with further modifications alternatively or in combination, in order to improve its usefulness.

- These modifications include pliable support at the back face, means to hang the device as a frame, interchangeable additional frames to be fastened by some means at the front face and having different shapes and surface treatments, the biasing of the slider by means of a spring into its fully opened or fully closed position, the division of the housing wall comprising the window into a multiplicity of windows, for example, for a pile of pictures, and another one for a pile of text cards, picture and text possibly being disposed on a common information carrier. Further, the window wall of the housing may be provided with space to permit a user to make notes thereon.

Further, it is possible to provide a space within

the device, preferably stationary within the housing, to store, e.g. the negative belonging to the photo negative disposed in the slider. Finally, the device may be provided at its front and on its rear face with a window each in which case, of course, two different sliders are mounted in parallel.

The following text describes examples of embodiments, one construction of which will be discussed in detail, in which provision is made for a spring pressure arrangement disposed in the housing to be disabled only during the return stroke of the slider member. Schematically illustrated examples of constructions restricted substantially to those elements essential to the comprehension then follow, in which the pressure arrangement is disabled also during the withdrawal of the slider member and/or in which the spring pressure arrangement is accommodated in the slider member. In the drawings:—

Figure 1 shows a highly schematic plan view from above of an embodiment of the invention showing the housing with the lid broken away and with the slider member inserted;

Figures 2 to 5 show in schematic longitudinal section through the device of Figure 1 during the sequence of the changeover operation in order to render clear the co-operation of the slider member and the spring plate;

Figures 6 to 9 illustrate these same stages as Figures 2 to 5 during a picture change, but with a pile of pictures inserted;

Figures 10 to 13 show the sequence of withdrawing the whole pile, similar to the sequence in Figures 2 to 5;

Figures 14 to 17 show the withdrawal of the pile, with the pile of pictures illustrated, similar to Figures 6 to 9;

Figure 18 is a schematic cross-section through the device;

Figure 19 is an illustration in cross-section, partially broken away, on a larger scale than Figure 18;

Figures 19a and 19b show alternative forms of embodiments of the separator;

Figure 20 is a longitudinal section to illustrate certain details of the design of the housing;

Figures 21 to 25b refer to a further example of an embodiment in which the transporter is a rotatable retaining element;

Figures 26a to 34b show substantially schematic views of possibilities for the structural design of pressure arrangements and slider

member-operated devices for disabling the pressure arrangements, wherein Figures denoted with "a" each show a longitudinal section and those denoted by "c" show a plan view of the pressure arrangement; and

Figures 35 to 38 show how the device can also be constructed to be placed upright as a picture frame.

Figures 1 to 20 relate to a first embodiment.

The housing 100 comprises a base plate 102, side walls 104, a back wall 106 and a lid 108

having a window 110. The slider member 112, movably guided between stops which are constructed in the side walls 104, consists of base bars 114, side bars 116, one front bar 118 and a separator bar 120. A pull 122 for pulling and pushing is formed on the front bar and a holding-down lug 124 is also formed on the front bar.

In the housing there is a pair of springs 126 biased to arch upwards, one end of each of the springs being anchored in the housing base plate 102 whilst the other end of each spring is able to execute a restricted sliding movement along the base plate. The springs 126 press against the main limbs 130 of a pressure plate 128 and urge this upwards; as indicated in Figure 1, the springs 126 are integral with the pressure plate and the arms of the springs 126 facing the back wall 106 are spaced further apart than the arms facing the front bar 118 of the slider member.

The two main limbs 130 of the pressure plate 128 are joined together by a cross member 132 on which a central limb 134 is shaped. Finally, auxiliary limbs 136 extend additionally from the cross member 132. The functions of these elements will be explained in detail later.

In the base plate 102 there is formed a guide 138 parallel to the direction of movement of the slider member, in which guide a button 140 may be slidably moved. The button 140 is urged towards the back wall 106 as far as a stop (not shown) by means of a restoring spring 142 and has a central hole in which the central tongue 134 of the pressure plate slides.

Control abutments 144 and 146 are shaped on the lateral bars of the slider member and their function will also be explained later.

On the main limbs 130 of the pressure plate there are mounted, e.g. glued, strips 148 of a commercially available plastics material which with only a slight contact pressure exerts an unusually high retentive force.

As will be realised, the pressure plate is intended to hold fast the bottom-most picture of the pile as the slider member is pulled out, while the separator bar takes with it the other pictures. When the slider member is returned, however, the effect of the upward application of pressure by the plate must be considerably reduced. The sequence of operation will be explained first of all with reference to Figures 2 to 5, without the pile inserted.

Figure 2 shows the initial state. The pressure plate lies under the influence of the springs 126 against the window 110 and the lid 108; the separator bar 120 is located between the pressure plate and the back wall 106. If the slider member 112 is now pulled, then the inclined face of the separator bar presses on the edges of the main limbs 130 that are facing it and these move downwards, as the springs 126 yield. The other end edges of the main limbs are, however, as before, pressed upwards. The control abutment 144 thus does not strike a control edge 150 of the main limb 130, which takes the form of a

lateral extension thereof, because it slides away beneath the abutment 144. In the final position of the slider member (Fig. 4) the separator bar 120 is pressing the front edges of the main limbs 130 downwards, and because of a "rocking movement" the rearmost edges of the same are correspondingly raised. If the slider member is now pushed in again, then the separator bar presses the pressure plate further down again, but the lowest position of the plate is now near to the front edges, that is to say, nearest the slider member. Therefore, the control abutments 144 now engage over the control edges 150 of the pressure plate and hold this down until the slider member has returned almost to its initial position again where the control elements disengage again and the pressure plate moves rapidly upwards again (cf. Figs. 1 and 5).

The actual picture change sequence proceeds as follows (Figs. 6 to 9): To begin with the pressure plate is loaded with a pile 152 of, for example, twenty pictures and therefore lies lower down than illustrated in Figure 2. As the slider member is pulled out, the separator bar takes with it all but one of the pictures of the pile, since the separator bar "sweeps" over the pressure plate. The bottom-most picture 152' however, against which the retentive covering 148 on the main limbs 130 directly presses from below, is held fast by the retentive covering and remains lying on the pressure plate 128. For the rest of the pile, the procedure takes place as described above with reference to Figure 3. Finally, the slider member reaches its end position shown in Figure 8, in which the pictures 152 fall at the front on to the base bars 114 of the slider member whilst still lying with their rear edges on the pressure plate. As soon as the separator bar 120 has slid over the ends of the auxiliary limbs 136 that are slightly biased in an upward direction, the picture 152' that has remained behind is pressed upwards a little by these ends at this (front) edge, so that when the slider member is reinserted, the rear face of the separator bar 120 pushes between the pressure plate and this picture 152' and raises the picture sufficiently far for it to be brought upwards over the upper edge of the separator bar. On further movement of the slider member its separator bar therefore slides below the picture 152' that positions itself in the final position as the uppermost picture on the pile 152. The insertion of the pile is thereby not hindered by the retentive covering 148 since, as mentioned above, the pressure plate is held down by the control elements 144, 150.

If the entire pile is to be removed, then the button 140 is displaced towards the front. As is apparent from Figures 10 to 13, the central tongue 134 of the pressure plate is downwardly curved so that an S-shape, which is straight in plan, is produced; the lower end of which projects into the button. If the button is displaced out of the position shown in Figure 10 into the position shown in Figure 11, then it presses on the upper inclined face 154 of the central tongue 134 and

pulls the complete pressure plate 128 down against the force of the springs 126, and in fact pulls down until the upper side of the retentive covering 148 is lower than the surface of the base bars 114 of the slider member 112. Thus, when the slider member is pulled out, the entire pile 150 is taken with it, as the pile now lies on the slider member itself. As a result of the biasing of the springs 126 and the friction contact of the central tongue 134 in the button 140, the button is not pulled back by the spring 142 which is weak in comparison. However, when the control abutment 146 strikes with its sloping control face 156 on the control edge 150, the pressure plate is pressed down even further and in this manner terminates the clamping between the button 140 and the central tongue 134 so that the button is pulled by the spring 142 into its rest position (Figure 12). Nevertheless, the control abutment 146 holds the pressure plate below the level of the base bars of the slider member so that the pile can be pulled out unimpeded to its full extent. Near to the end of the path movement the control abutment 146 releases the control edge 150 again; the springs 126 are able to press the pressure plate upwards again at its rear edge whilst at the front it is still held down by the separator 120.

From the above explanations the sequence can be followed again with reference to Figures 14 to 17 when a complete pile is to be removed; the positions of the slider member according to Figures 14 to 17 are analogous to those of Figures 10 to 13.

Figure 18 shows once again the relative positions of the base bars 114 on the one hand, and the pressure plate 128 on the other hand when the button is in the removal position.

In principle, it would also be possible to return the button into the rest position by means of a control member (not shown) simply during the return of the slider member. However, it may be seen that in the embodiment illustrated there is the advantage that by holding the button firmly in the removal position, the device can be held permanently ready for the removal operation, which is important in conjunction with the stacking frame which is still to be described, or during despatch of delicate pictures.

The operations that are effected by the pressure plate will now be summarised once again.

During *picture change-over*, the pressure plate is always held straight with the line of contact of the separator (transversely to the movement of the slider member) on the bottom-most picture. The picture to be retained is consequently clamped reliably in the position required. During the return of the slider member on the other hand the control elements 144 to 150 hold the pressure plate below the level of the base bars of the slider member (or other support means, e.g. on the base plate of the housing) so that the retentive covering 148 does not touch the underside of the pictures.

During the *change-over of the pile* the pressure plate is brought into the same position as during the change-over return stroke but by means of a button that can be actuated separately. This can be held in the position in which the pile can be changed as the slider is withdrawn, but springs back automatically without further manipulation into picture change-over position at the end of the withdrawal movement. It will be seen that in this manner the device is fool-proof.

The pressure plate is so constructed that it also reliably holds fast badly curved pictures and permits the change-over and removal procedure to take place. In order to deal with such "bent" pictures, however, a series of further features is provided in order to prevent incorrect operation.

Pictures that are curved downwards about the transverse axis—at right angles to the direction of the movement of the slider member—could lead during the picture change to the top-most or a few of the upper pictures not being pushed back by the end wall 118 of the slider member but being jammed between the end wall of the slider member and the lid of the housing. For this reason the holding-down lug 124 is provided, beneath which the pictures can be manipulated as they are inserted; further possibilities are discussed below.

Pictures that are curved in a reverse direction would not be able to allow the passage of the separator during the change-over process, but would push against this. In this case an especially low-friction material may be used for the separator, and instead of manufacturing the complete slider member in one piece in an injection moulding process, the separator may be attached as a separator part.

Pictures that arch downwards about the longitudinal axis could admittedly lie laterally on the base bars of the slider member during the return stroke of the slider member and in this way remain clear of the retentive covering of the pressure plate, but would push centrally on to the facing edge of the central limbs 132 of the pressure plate. For this reason the relevant edge of the pressure plate which is interrupted by the springs 126 and the auxiliary members 136, is designed to converge to a point, as is apparent from Figure 1. A reverse arching of the pictures would not lead to any difficulties.

Although the pictures must, of course, lie freely in the slider member, disruptions might occur if the pictures were to lie crookedly. For this reason stop projections 160 and 162 which project from below and from above, respectively, are shaped on the back wall 106 and project to such an extent that they extend through recesses 164 and 166 of the separator 120 when this is in its inner end position (Figure 19). In this position one projection 162 in each case near to the lateral walls of the housing projects downwards from the lid thereof towards the interior and further inside a projection 160 projects upwards from the base plate towards the interior. The projection is aligned in the direction in which the slider

member is pulled out with one of the retentive coverings 148, with the result that the corresponding recess 166 of the separator itself ensures that the separator cannot touch the retentive coverings. A further recess 168, which is formed in the slider member from above leaves room for the passage of holding-down cams 170 which project downwards from the lid and may be clearly seen in Figure 20; they have been omitted from the other Figures in order to keep these clear. Their function is to press down the uppermost picture so far below the upper edge of the separator when the slider member has been inserted as to make certain that the slider member takes with it the uppermost picture. Similar holding-down cams that extend further down and are likewise indicated best in Figure 20 are located near to the front edge of the lid; they have the function of pressing the pile pulled out during the change-over so far below the level of the lower side of the picture 152' lying on the pressure plate that the sliding movement of the picture 152' over the separator is effected as far as possible without any hindrance. In Figure 19, the upper sides of the pictures are indicated below the cams 170 and 172 by broken lines 170' and 172'.

Finally, it is also apparent from Figure 19, in which however, this effect has been considerably exaggerated, how the picture held fast on the retentive coverings 148 is stressed by the separator 120 and thereby held so that it clings reliably.

The exact profile of the separator in the transverse direction depends on the type of pictures to be formed into a pile, on the choice of material and other components. A compromise must be made here between the space requirement occasioned by the necessarily inclined attitude of the separator, the fact that the separator must slide over the length of the firmly held picture but not pass the front edge of the pressure plate, and an optimum inclination for the faces of the separator. For fairly smooth plastics material an angle of about 45° to 60° has proved successful, although this angle need not be constant, as indicated only schematically in Figures 2 to 17, but may also vary along the inclined faces or may be different on the two faces.

The above described embodiment had the separator arranged on the slider member and the transporter arranged on the pressure plate. In the embodiment shown in Figures 21 to 25b the separator is arranged in the housing and the transporter is a flattened sleeve which is caused to rotate by the slider member and pulls away the uppermost picture of the pile which is then pushed by the slider member under the pile again, the pressure arrangement being disabled.

Figures 21 to 24 show in substantially schematic longitudinal section, the housing, slider member, pressure arrangement and the pile of pictures in their individual operational positions during the picture change, whilst Figure 25 shows

a plan view, half cut away, of a control plate for disabling the pressure arrangement as the slider member is being re-inserted, which control plate lies close above the base of the housing.

- 5 The housing 201 has a viewing aperture or a window 213 which may be closed by a transparent plate. A slider member 207 may be pulled parallel to the window 213 out of the housing through an aperture 214 in the housing, the movement being limited by stops (not shown).
10 A pile 215 of, for example, twenty pictures, is arranged beneath the window 213 with the picture side facing the window, and is pressed against the frame parts of the housing 201 that surround the window by a pressure arrangement 203 (Fig. 21). The narrow side of the housing 201, on the left in Figures 21 to 24, is closed by a lid 202 which may be snapped in or hinged and which, when removed, allows the pile 215 to be
20 changed.

- The pressure arrangement 203 comprises a pressure plate 216 supported by leaf springs 217 which are secured to the base 218 of the housing. The pressure plate has a bulge 208 or is arched to
25 the same effect so that there is always a gap between the lower edge 219 of the pile facing the slider member and the underlying front edge 220 of the plate 216 into which gap a picture can be inserted (Figures 23 and 24).

- 30 A separator 206 is fixed in the housing. Above the separator the framework of the housing has an approximately rectangular chamber 221 in which a "bearing pin" 225 having an elliptical cross-section is mounted in fixed position, the
35 retentive element 223 being mounted on this bearing pin. The retentive element is a short length of tubing of sandwich construction of which the inner face facing the pin 225 has a very low coefficient of friction against the material of
40 which the pin is made, but of which the outer face, for example as a result of a rubber coating, exhibits a very high static friction both to the picture support material and to the material of which the slider member consists.

- 45 The arrangement is so designed that the underside (or the "lower run") of the retentive element 223 facing the pile lies slightly lower down than the lower edge 212 of the frame surrounding the window 213 with which frame in
50 turn the upper edge of the lateral bars 224 of the slider member 207 is flush.

- The long axis of the ellipse is furthermore so long that as the retentive element rotates on the pin 225 the uppermost picture 211 is held at a
55 part of its surface close to the slider member, and the long axis extends beyond the separator 206 so as to convey the rear edge of the picture over the separator.

- The slider member has a U-shaped outline with
60 lateral arms 226 (Fig. 25a) and a transverse arm 227 at the end face, as well as lateral bars 224 projecting upwards from the lateral arms 226, and a front bar 227 which closes off the housing aperture at the front when the slider member is
65 inserted. The slider member can be pulled out by

the pull 229.

- 70 Arranged in the region of the base of the housing left clear by the U-shaped outline of the slider member are the springs 217, already mentioned, as well as a disabling mechanism. This consists of a rigid control plate 230 guided in guides 231 formed on the base 218 of the housing, of which the transverse member 232 in the rest position of the control plate (Fig. 21 and
75 22) lies behind the leaf spring 217 that is closer to the housing aperture. Lateral projections 233 from the control plate are disposed in the path of movement of inwardly projecting abutments 234 formed on the lateral arms of the slider member.

- 80 The operation of the device is as follows:

- In the closed position (Fig. 21) the uppermost picture 211 lies against the lower edge 212 of the window frame. It also lies against the underside of the retentive elements 223 against which in
85 turn—at the side of the pile of pictures 215—the lateral bars 224 lie. When the pull 229 is pulled to the right, the slider member rotates the retentive element as a result of the frictional contact, which element is pliant enough to follow the elliptical
90 shape of the pin 225 so that the picture 211 is conveyed out at the speed of the slider member. The frictional contact between pictures and transporter is assisted by the pressure arrangement 203. The separator acts as a stop for
95 the remainder of the pile since the gap between separator and retentive element 223 allows only one picture to pass through (Fig. 22). In the outermost position of the slider member (Fig. 23) the transporter has moved the picture 211 right
100 over the separator 206. Shortly before this the abutments 234 have met the projections 233 of the control plate and have pushed this to the housing aperture 214, the transverse member 232 of the control plate sliding onto the leaf
105 spring 217 that is closer to the housing aperture and in so doing pressing this down. As a result of the resiliency of the leaf spring and the friction between the parts, the control plate remains clamped in this position. In the course of this the
110 plate 216 is pulled down so far towards the base 218 of the housing that it is lower than the upper side of the lateral arms 226 of the slider member, on which arms the picture 211 then rests, so that this picture is safely pushed between the edge
115 220 and the pile edge 219 when the slider member is moved back. In the course of this the plate 216 also remains clamped down with the result that the retentive element 223, now driven
120 by the slider member in the opposite direction of rotation, turns freely, without bearing against the now uppermost picture 211'. The return movement of the slider member is consequently unimpeded until the control plate is pushed back into its initial position by means of the inner side
125 of the end arm 227 of the slider member 207 running onto it.

- A further guide 235 is provided in the base 218 of the housing for a button 236 with which, even when the slider member is pushed in, the control plate can be shifted from the outside into
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the position disabling the pressure arrangement 203, the slider member being, of course, pushed out slightly; this button is operated before the lid 202 is opened so as to change the pile of pictures or, in any case, when the pictures are not to be changed but are to be stored or dispatched, so as to remove the pressure from them.

The following examples are indicated only in principle in the drawings since the operations can be seen at a glance taking into consideration the detailed explanations above and the comments given below on the individual constructions. The examples all embody the invention as defined in claim 1 even though their constructions are not described in detail.

As shown in Figures 26a and 26b, the pressure arrangement consists of two doubly cranked wires 301 which are rotatably mounted on the housing base 302. In the closed position they are turned beyond upper dead centre and in this position press the pile 303 upwards. When the slider member is pulled out the separator 304 on it moves to the right—here the uppermost picture is held fast by a transporter (not shown) in the housing—it strikes against a pressure plate 305 which rests on the wires 301, after which the wires rotate through about 90° in a clockwise direction. At the end of the return movement the pressure plate is lifted up again by the slider member.

The embodiment of Figures 27a, 27b is similar. The wires 310 are in this case mounted so as to be pivotable about the axes that are parallel to the direction in which the slider member is pulled out and are biased inwards by a spring 312. A pressure plate 313 has a retentive covering so that the bottom-most picture pile 314 is held fast when the slider member slides out, the separator on the slider member forcing apart the wires 310 against the spring force for the lower edge of the separator 315 is lower than the bottom-most picture of a pile 314 of maximum thickness. An extension 316 is attached to each wire beyond the end edge of the pile nearer the withdrawal end so that the wires are also still held spread apart when the separator has slid over the held picture by the extension 316 which then lies against the separator and the wires are held pressed down during the return movement also until they are released again from the separator. Here, the pressure arrangement in actual operation only when the uppermost picture of the pile is in the viewing position but during the withdrawal of the slider member the pressure arrangement is operative to hold fast the bottom-most picture which is held fixed between the pressure arrangement and the separator.

The following examples are explained only in outline.

Figures 28a, 28b: wedge cams 320 on slider member base 322 cause springs 324 of the pressure arrangement, which are secured centrally to the housing base, to exert a pressure on the pile 326 only when the slider member is inserted. The transporter is an adhesive coating

on pressure plate 327.

Figures 29a, 29b, 29c: two flat bows 330 lie close to the base 332 of the housing and each carry two rigid pressure strips 334. Lateral pressure springs 336 are put under pressure by the slider member only when this is close to its 'home' position and arch the bows 330 upwards, whilst the springs 336 are relaxed during the withdrawal and insertion of the slider member so that the bows lie flat.

Figures 30a, 30b: leaf springs 340 carry a one-piece pressure plate or separate cross-pieces 342. Close to the part of the springs near the base 340 a control member 344 similar to that mentioned above referring to Figures 21 to 25, can be pulled over both springs and thus press these down, so that the slider member, as in other examples, takes with it the pictures so that by appropriate stops it is possible to determine on which region of the path of the slider member the disabling is to take place. It is preferred to press down first of all one and only thereafter the other of two springs arranged one behind the other (in the direction of withdrawal) so that the movement of the slider member does not stiffen too suddenly.

Figures 31a, 31b, 31c: here, the springs 352 mounted in the housing base 350 so as to rotate about a vertical axis are rotated by a slider member-controlled rod system through a predetermined angle, the springs being held against the base by clips 354 fixed to the housing base over a greater or lesser part of their longitudinal extent and thereby disabled.

Figures 32a, 32b: wedge cams 360 controlled by the slider member press upwards beneath the middle sections of springs 362 as the slider member is pulled out, the springs being flexibly supported on both sides of this point in a retained position 364 on the housing. The ends of the springs 366 pivot downwards and are thus disabled. Only when the return movement of the slider is almost complete are the wedge cams 360 pushed out again.

Figures 33a, 33b: here, the pressure arrangement is disposed not on the housing but on the slider member. The springs 370 are initially hooked into the housing base by means of a hook 372 while a pressure plate 374 engages with lateral pins 376 arranged laterally on the slider member. When the slider member is pulled, the pins slide first of all downwards along the guide groove and finally strike the base, a movement which can be used to unhook the end of the spring on the housing; however, alternatively, simple wedge cams on the slider member may be used for this purpose. When the slider member is re-inserted, the reverse procedure takes place, i.e. the hook will catch in the slot in the housing base and the pins will slide from the base upwards along the guide groove. The uppermost picture is retained in the housing by an adhesive element at the inner face of the window frame.

Figures 34a, 34b: a pressure spring 380 secured centrally to the base of the slider member

runs in the housing onto fixed wedge cams 382 and is so doing is biased into the pressure position.

The above explanations to Figures 26a to 34b only reproduce in outline the means by which the pressure arrangement can be, for example, disabled.

It should be noted that the arrangement of the pressure elements on the slider member is only possible when the disabling according to the invention is provided.

It is to be noted further that it is the disabling of the pressure arrangement for re-insertion of the picture pile which permits dimensioning of the pressure arrangement bias powerful enough to keep the picture under the window flush therewith in spite of a bulky pile comprised of many pictures subjected to deformation due to, say, changes of ambient conditions. In result, the device may be used as a neat stand-up or hanging frame.

Figures 35 to 38 illustrate the use of the device as a stand-up frame. A pull 410 on the slider member and a viewing window 412 of the device can be seen. The device consists of injection-moulded plastics parts, especially housing 414 with window 412. Whereas narrow edges 416 run, generally, at right angles to the window face, an arm 418 has a shallow recess 420, the cross-section of which may be seen in Figure 35. According to this Figure, base 422 of the recess is flat but not parallel to the narrow edge 416 and thus at right angles to the window face, but forms with the latter an angle A of less than 90° , for example of 80° .

Standing at right angles on the base 422 a pivoting pin 424 is shaped on the arm 418. The pin 424 has slots parallel to the axis and has a somewhat enlarged head 426 so that its profile in longitudinal section is approximately mushroom-shaped. At its free head end the pin is so cut away that it is flush with the remaining edge 416 of the arm 418.

Outer edges 438 and 440 of the supporting prop are flush with the rest of the arm 418.

Figure 37 shows the pivoted position of the supporting prop 430 when the device is set up on its lower edge opposite the pull 410. As it is pivoted outwards, the supporting prop does not remain in a plane perpendicular to the viewing window 412, but in a plane with the bottom 422 of the recess, so that its supporting face is approximately behind the stand-up edge of the device. This provides thereby a more secure standing position.

As shown in Figure 38 an inclined position is also obtained when the device is set up on the arm 418. The line of contact between the supporting face of the supporting prop runs at an acute angle to the arm 418 so that the device is in a convenient viewing position but is securely supported.

It should be noted that the outward or inward pivoting movement may be additionally used to control certain operations of the change-over

mechanism, for instance the permanent disabling of the pressure arrangement.

Between the housing and the slider member an auxiliary spring may be arranged which either restores the pulled-out slider member automatically or is compressed during the return movement so that the slider member is ejected, for instance by pressing a button.

The slider member may have, for instance near to its pull, elements for connection to control a motor drive means, provided, for example, in an episcopes in which the device may be inserted.

Reference is made to six co-pending British patent applications filed concurrently with this application by the same applicant, which disclose arrangements which may be within one or more of the claims of this application and which have claims which may be infringed by the embodiments described herein. The co-pending applications are 78.37449, 78.37451, 78.37453, 78.37454, 78.37455 and 78.37536.

Claims

1. A picture storage box and viewer device having a housing with a viewing window for accommodating a pile of pictures, the uppermost picture of which faces the viewing window, the device having a slider member that may be displaced between limiting stops in a sliding movement, parallel to the viewing window through an aperture arranged in one side of the housing, in and out of the housing, a pressure arrangement to press the pile of pictures against the viewing window and a picture change mechanism including a transporter arranged to co-operate with the slider member in order that as the slider member is pulled out a picture on one side of the pile is removed from the pile, and this picture is re-inserted on the other side of the pile as the slider member is re-inserted, wherein there is provided a device, operated by said sliding movement, for disabling the pressure arrangement.

2. A device according to Claim 1, wherein the device for disabling the pressure arrangement is arranged to disable it only for a major portion of the return movement of the slider member into the housing.

3. A device according to Claim 1, wherein the device for disabling the pressure arrangement is arranged to disable it for a major part of both the withdrawal and the return movements of the slider member.

4. A device according to Claim 2 or 3, wherein the disabling device includes abutments that are movable relative to the pressure arrangement and enter into operative connection with a spring tensioning device of the pressure arrangement only in the operative position of the pressure arrangement.

5. A device according to Claim 2 or 3, wherein the disabling device includes abutments that are movable relative to the pressure arrangement and are in operative connection with a spring tensioning device of the pressure arrangement



runs in the housing onto fixed wedge cams 382 and is so doing is biased into the pressure position.

5 The above explanations to Figures 26a to 34b only reproduce in outline the means by which the pressure arrangement can be, for example, disabled.

10 It should be noted that the arrangement of the pressure elements on the slider member is only possible when the disabling according to the invention is provided.

15 It is to be noted further that it is the disabling of the pressure arrangement for re-insertion of the picture pile which permits dimensioning of the pressure arrangement bias powerful enough to keep the picture under the window flush therewith in spite of a bulky pile comprised of many pictures subjected to deformation due to, say, changes of ambient conditions. In result, the device may be used as a neat stand-up or hanging frame.

20 Figures 35 to 38 illustrate the use of the device as a stand-up frame. A pull 410 on the slider member and a viewing window 412 of the device can be seen. The device consists of injection-moulded plastics parts, especially housing 414 with window 412. Whereas narrow edges 416 run, generally, at right angles to the window face, an arm 418 has a shallow recess 420, the cross-section of which may be seen in Figure 35. According to this Figure, base 422 of the recess is flat but not parallel to the narrow edge 416 and thus at right angles to the window face, but forms with the latter an angle A of less than 90°, for example of 80°.

35 Standing at right angles on the base 422 a pivoting pin 424 is shaped on the arm 418. The pin 424 has slots parallel to the axis and has a somewhat enlarged head 426 so that its profile in longitudinal section is approximately mushroom-shaped. At its free head end the pin is so cut away that it is flush with the remaining edge 416 of the arm 418.

40 Outer edges 438 and 440 of the supporting prop are flush with the rest of the arm 418.

45 Figure 37 shows the pivoted position of the supporting prop 430 when the device is set up on its lower edge opposite the pull 410. As it is pivoted outwards, the supporting prop does not remain in a plane perpendicular to the viewing window 412, but in a plane with the bottom 422 of the recess, so that its supporting face is approximately behind the stand-up edge of the device. This provides thereby a more secure standing position.

50 As shown in Figure 38 an inclined position is also obtained when the device is set up on the arm 418. The line of contact between the supporting face of the supporting prop runs at an acute angle to the arm 418 so that the device is in a convenient viewing position but is securely supported.

55 It should be noted that the outward or inward pivoting movement may be additionally used to control certain operations of the change-over

mechanism, for instance the permanent disabling of the pressure arrangement.

70 Between the housing and the slider member an auxiliary spring may be arranged which either restores the pulled-out slider member automatically or is compressed during the return movement so that the slider member is ejected, for instance by pressing a button.

75 The slider member may have, for instance near to its pull, elements for connection to control a motor drive means, provided, for example, in an episcopes in which the device may be inserted.

80 Reference is made to six-co-pending British patent applications filed concurrently with this application by the same applicant, which disclose arrangements which may be within one or more of the claims of this application and which have claims which may be infringed by the embodiments described herein. The co-pending applications are 78.37449, 78.37451, 85 78.37453, 78.37454, 78.37455 and 78.37536.

Claims

1. A picture storage box and viewer device having a housing with a viewing window for accommodating a pile of pictures, the uppermost picture of which faces the viewing window, the device having a slider member that may be displaced between limiting stops in a sliding movement, parallel to the viewing window through an aperture arranged in one side of the housing, in and out of the housing, a pressure arrangement to press the pile of pictures against the viewing window and a picture change mechanism including a transporter arranged to co-operate with the slider member in order that as the slider member is pulled out a picture on one side of the pile is removed from the pile, and this picture is re-inserted on the other side of the pile as the slider member is re-inserted, wherein there is provided a device, operated by said sliding movement, for disabling the pressure arrangement.

2. A device according to Claim 1, wherein the device for disabling the pressure arrangement is arranged to disable it only for a major portion of the return movement of the slider member into the housing.

3. A device according to Claim 1, wherein the device for disabling the pressure arrangement is arranged to disable it for a major part of both the withdrawal and the return movements of the slider member.

4. A device according to Claim 2 or 3, wherein the disabling device includes abutments that are movable relative to the pressure arrangement and enter into operative connection with a spring tensioning device of the pressure arrangement only in the operative position of the pressure arrangement.

5. A device according to Claim 2 or 3, wherein the disabling device includes abutments that are movable relative to the pressure arrangement and are in operative connection with a spring tensioning device of the pressure arrangement



only in the disabled position thereof.

6. A device according to Claim 5, wherein the disabling device is arranged to act against the spring tension of the pressure arrangement.

7. A device according to Claim 6, including control cams arranged on the slider member or on the housing and control faces arranged on the pressure arrangement, onto which the control cams run as the slider member executes its return movement.

8. A device according to Claim 7, wherein the pressure arrangement includes an assembly or pressure plates and tensioning leaf springs which are arranged to act approximately centrally on the assembly of plates, and that the assembly of plates is caused to perform a rocking movement as the slider member is pulled out so that the control cams pass the control faces but run onto the control faces when the slider member executes its return movement.

9. A device according to Claim 4, wherein the abutments are wedges mounted on the slider member.

10. A device according to any preceding claim, including an external control element capable of selectively disabling the pressure arrangement without substantial dependence on the position of the slider member.

11. A device according to any of Claims 3 to 10, wherein the pressure arrangement is mounted on the slider member.

12. A device according to Claim 8, wherein the transporter is an adhesive, retentive or high friction element disposed on the pressure arrangement facing the pile, the pressure arrangement being mounted in the housing, the slider member carries the control cams, and a plate of the pressure arrangement carries the control faces beside said adhesive element.

13. A device according to Claim 10 wherein the external control element is a control button by means of which the leaf springs may be pulled or pushed away from the housing window.

14. A device according to Claim 13, wherein the button is slidable and is arranged to be returned into its initial position upon the slider member return stroke.

15. A device according to claim 14, wherein the button is biased towards its initial position by a retrieval spring, the arrangement being such that, in use, the button when actuated is held against the bias of the retrieval spring by frictional clamping exerted by the leaf spring until the device operated by said sliding movement disables the pressure arrangement.

16. A device according to claim 2, wherein the pressure arrangement comprises leaf springs mounted on the housing bottom and in the housing there is provided a depressing plate to act on the leaf springs, which plate is moveable a short distance in the direction of movement of the slider, the depressing plate being arranged to allow the leaf springs to act as a pressure arrangement when the depressing plate is in an initial position with the slider member pushed

fully home, and arranged to be moved by the slider member so that when the slider member is adjacent its outermost position the depressing plate have moved to a position in which the depressing plate compresses the leaf springs, the depressing plate being pushed back into its initial position by the slider member when the slider is adjacent its inner end position during its return stroke.

17. A device according to claim 16, wherein movement of the depressing plate is effected by stop cams provided on the depressing plate being engaged by abutment cams provided on the slider member, the abutment cams being disposed adjacent the leading and trailing ends, respectively of the slider member.

18. A device according to Claim 3, wherein the pressure arrangement is mounted on the housing and comprises levers carrying a pressure plate, rotated in the innermost position of the slider member beyond a toggle position and counterrotated by a separator mounted on the slider member into a position further from the housing window, the pressure arrangement being re-erected at the end of the slider member return stroke.

19. A device according to Claim 3, wherein the pressure arrangement comprises spring bows supporting a pressure plate and mounted pivotably about axes parallel to the slider motion on the housing bottom, the bows being biased inwardly by a spring, and a separator is provided on the slider member which, upon passing along the pressure plate depresses it towards the housing bottom.

20. A device according to claim 3, wherein the device for disabling the pressure arrangement comprises springs carried by the slider member, the said springs carried by the slider member being connected to bias springs constituting the pressure arrangement and being arranged to make the bias springs effective as a pressure arrangement only when the slider member is adjacent its innermost position.

21. A device according to claim 2 or 3, wherein the device for disabling the pressure arrangement comprises grooves in the slider member arranged to co-operate with control elements for the pressure arrangement in the manner of a cam and follower, the pressure arrangement being mounted on the housing.

22. A device according to claim 2 or 3, wherein the pressure arrangement comprises spring elements pivotable about axes which are perpendicular relative to the plane of the window, and the device for disabling the pressure arrangement comprises means to allow the spring elements to be effective as a pressure arrangement when the spring elements are in a first angular position and to disable the spring elements when they are in a second angular position, and a linkage to cause the reciprocating movement of the slider member to give a rotative movement of said spring elements.

23. A device according to Claim 22, wherein



the spring elements are helical leaf springs each engaged by a holding down wedge which is mounted on the housing bottom.

24. A device according to any of Claims 1 to 10 and 12 to 23 wherein the pressure arrangement is mounted on the housing and the slider member is provided with a separator serving to convey the pile outwards.
25. A device according to any of the preceding claims, wherein the slider member is biased by a spring into one of its end positions.
26. A device according to Claim 25, wherein the slider member is biased into its outermost position and is locked in its innermost position by

- 15 a manually releasable locking mechanism.
27. A device according to any of Claims 1—27 arranged as a stand-up or hanging picture frame.
28. A storage box and viewer device substantially in accordance with any embodiment of the invention described herein with reference to the accompanying drawings or any modification of such embodiment being a modification described herein with reference to the accompanying drawings.
29. An episcope incorporating a device according to any of claims 1 to 26 or claim 28.