

Picture viewer

The present invention relates to a picture viewer, in particular for photo prints, including an exchange mechanism in order to cyclically exchange that one of a stack of pictures which is presented at a viewing window.

A picture viewer of this type is disclosed in US patent specification 4.259.802 and described in detail with reference to Fig. 1 - 20 thereof, and the disclosure of this patent specification is included herein by reference.

Briefly, the known picture viewer comprises a housing with a viewing window and a slider or drawer which may be reciprocated parallel to said window and relative to said housing. The housing has a spring bias system arranged to urge a stack of pictures against the window as long as the slider is received in the housing, and a retentive coating on the spring bias system retains the lowermost picture of the stack in the housing upon withdrawal of the slider, the latter in turn being provided with a separator bar arranged to force the remainder of the stack to be conveyed by the slider out of the housing. Upon the slider's being pushed home, the retained picture will "climb" up the separator bar and will assume a position on top of the stack, i.e. beneath the housing window.

The present invention provides a picture viewer, comprising:

- a first frame member having a viewing window,
- 5 a second frame member slidably received in said first frame member and reciprocable in a direction parallel to said window,
- 10 said second frame member carrying a bias system arranged to urge, with said second frame member fully pushed home in said first frame member, a stack of pictures against said window, and
- 15 said bias means being arranged to lift, with said second frame member being withdrawn from said first frame member into a position defined by stop means, said stack of pictures relative to said second frame member into a position in which it
- 20 is presented for convenient removal therefrom.

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Embodiments of the picture viewer of the present invention will be described hereunder in detail with reference to the accompanying drawings.

5 Fig. 1 is a plan view of a first embodiment with the slider fully withdrawn,

Fig. 2 is a section along line 2-2 of Fig. 1 but with stop flaps displaced to assume their "loading" position,

10 Fig. 3 illustrates in section along line 3-3 the outer slider end, however with the slider fully pushed home into the housing,

Fig. 4 is a partial plan view analog to Fig. 1 to illustrate a modified embodiment, with the viewer closed,

15 Fig. 5 is a section view along line 5-5 of Fig. 4, however, with the slider being withdrawn, i.e. with the viewer opened,

20 Fig. 6 is a section view along line 6-6 of Fig. 5 with the slider being at about halfway of its stroke, and

Fig. 7 is an illustration analog to Fig. 5 of a further modified embodiment.

25 It is to be understood that the drawings are intended to illustrate primarily the novel features which bring about the improvement, other details of the design being disclosed in the publication mentioned above so that they may be
30 readily adopted.

A first embodiment of the picture viewer according to the invention is described with reference to Fig. 1, 2 and 3.

The first frame member is a housing 1 provided with a viewing window 2 formed e.g. by a pane of transparent plastic material, the remainder of housing 1 being injection molded of opaque plastic material. Slidable relative to housing 1, a second frame member is constituted in the form of a slider 3 of substantially frame-like structure with a grip portion 5 at its outer end, longitudinal struts 6 and 7 extending in direction of the slide stroke, and a separator element in the form of a separator bar 4 joining the struts 6 and 7 adjacent the inner slider end.

Leaf springs 8 are mounted on each strut 6, 7 at their centers 9 by means of rivets or the like. The length of leaf springs 8 is selected such their distal ends pointing to the housing cannot leave the latter even with the slider fully withdrawn while their other distal ends pointing away from housing 1 extend beneath stop flaps 10. - Fig. 1 and 3 show the operative position of these flaps, i.e. the position in which they act as stop means for the corners of a stack of pictures 11 urged away from struts 6, 7 by springs 8; in this position, the user may perform the exchange operation by reciprocating the slider 3 relative to housing 1. If, however, a stack of pictures is to be removed or inserted (see Fig. 2), flaps 10 may be pivoted about a shaft 15 to assume the "loading" position indicated in Fig. 2. To load the viewer, stack 11 is aligned with the housing opening as shown in Fig. 2 and pushed inwards as indicated by arrow 12, thereby depressing the inwards pointing spring ends 13. The outer stack edges are then depressed

(arrow 14) so that they become positioned in front of the inner face of grip portion 5. Flaps 10 are then returned into the operative position.

Shaft 15 is received in slots 21 of grip portion 5 and biased by coil spring 16 to the outermost ends of the slots. In the operative position, edges 19 of flaps 10 engage the inner face of slider front wall 17, flap extension 18 engaging over the top edge of front wall 17.

In order to pivot flaps 10 into their load position, a key 20 slidably received in slider front wall 17 is depressed and forces flap edge 19 inwards. These forces acting at a point offset with respect to shaft 15, a torque tends to pivot flaps 10 about shaft 15, and the flaps will indeed pivot into the load position once extension 18 has come free of front wall 17. Spring 16 will stabilize the load position in that it makes the top face²⁸ of flaps 10 engage the inner face of slider front wall 17.

Means to implement the cyclic picture exchange are provided, and for a detailed explanation, the publication referred to above may be consulted. Briefly, a retentive element is mounted on the bottom 30 of housing 1 and comprises a high friction coating 22 on the surface of a lever arm 23 facing window 2. With slider 3 fully pushed home into housing 1, lever arm 23 will assume the position indicated in dashed lines in Fig. 2. Upon withdrawal of the slider, coating 22 retains the lowermost

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picture of stack 11 while the remaining pictures are carried outwards on slider struts 6, 7 pushed by separator bar 4. As soon as the letter engages lever system 23, the latter is depressed against the bias of spring 24 and it will remain in this disabled position until bar 4 will return into the housing 1. With slider 3 fully withdrawn, an auxiliary spring 25 urges the rear edge of the retained picture, i.e. the edge remote from the housing opening, upwards to window 2 and thus in front of stop extensions 26 integrally formed with housing 1. The front end of the retained picture will then be presented in front of the inwardly facing bevel of separator bar 4, and when now slider 3 is pushed back into housing 1, this picture front end will "climb" up this bevel because its opposite edge is engaged by stop extensions 26 and cannot yield. Consequently, the retained picture will pass, during the return stroke of slider 3, over separator bar 4 through a clearance provided between bar 4 and the top wall of housing 1 while the remainder of the stack 11 is conveyed into housing 1 beneath said one picture. Thus, upon each reciprocation of slider 3 relative to housing 1, the lowermost picture is conveyed to become the uppermost then presented at window 2, and because springs 8 urge against the picture corners at points indicated at 27, the picture beneath the window will be presented in flat shape; it is to be noted that this design is particularly useful for pictures in the form of photographic prints because, whenever such prints are bulged, the coating side will be on the outside of the bulge.

It will be understood that springs 24 and 25 are very weak as compared with springs 8 so that the frictional conditions during slider reciprocation vary only slightly in spite of the

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deflection of springs 24, 25 occurring thereby. It may be desired to design spring 24 such that the bias produced by it remains substantially constant irrespective of the degree of deflection; a type of spring exhibiting such feature may consist of a coil spring disposed along the pivot axis of lever system 23 and having extended wire ends, one supporting lever 23 and the other abutting the housing bottom.

It will be noted that in the embodiment of Fig. 1, 2 and 3 upon initiation of the slider return stroke, when the retained picture passes over separator bar 4, the inwards pointing distal ends 13 of leaf springs 8 will continue to urge stack 11 upwards and in engagement with the housing top wall. This is the more true as it cannot be predicted how many pictures will be loaded by the user into one viewer which, nevertheless, is supposed to function properly even with only a few prints therein so that the bias of springs 8 must be dimensioned accordingly. The retained picture, however, must penetrate between the housing top wall and the -- then -- uppermost picture of the remaining stack in slider 3 with the risk that under adverse conditions, the retained picture being insufficiently stiff, it may become bulged.

Fig. 4, 5 and 6 illustrate a slight modification permitting to overcome this risk.

As may be seen in Fig. 4, the configuration of springs 8' has been slightly modified in that distal ends 13' are offset inwards with respect to the outwards pointing ends 13". Integrally injection molded with housing bottom 30, there are hooks 32 having an upstanding base 34 and a laterally outwardly extending arm 36 in superposition relationship with the respective adjacent slider strut 6 and 7, clearance between them being provided to permit passage of the leaf spring ends 13' upon withdrawal of slider 3. However, the lateral extension of arms 36 is dimensioned such that there will be no interference with the other leaf spring end 13".

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About halfway of the slider stroke, arms 36 engage over spring ends 13' and with continued withdrawal of the slider, spring ends 13' are progressively depressed with the result
5 that the ends of the pictures in the stack adjacent the housing become loosened. Upon pushing home of slider 3, the leading edge of the retained picture can freely enter the space 38 on top of the stack until the arms 36 will
10 have released spring ends 13'. Thus, the risk of the separated picture to become damaged is greatly reduced.

The retentive element is not illustrated in Fig. 4 through 6 nor is the auxiliary spring,
15 reference being made to Fig. 1-3.

Fig. 7 illustrates a further modification in which, contrary to the preceding embodiments, the picture immediately beneath the window 2 is retained in the housing 1 upon withdrawal
20 of slider 3 (the retentive element may be implemented by a high friction coating around the window adapted to engage a narrow picture edge portion, complemented by a soft spring analog to the auxiliary spring 25 of the first embodi-
25 ment and adapted to suppress the picture edge adjacent the housing opening after withdrawal of the slider so that it may be engaged by bevel 40 of separator bar 42). Fig. 7 shows that with the slider fully pulled out, the
30 separated picture⁴² rests upon rails 44 upstanding from the housing bottom so that spring ends 13' may engage thereunder upon the slider's being returned into the housing.

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Attention is drawn to the claims of our patent application No. 83.33060 (Serial No. 2,131,570) of which the present application is a divisional application.



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CLAIMS:

1. A picture viewer, comprising:

a first frame member having a viewing window,

a second frame member slidably received in said first frame member and reciprocable in a direction parallel to said window,

said second frame member carrying a bias system arranged to urge, with said second frame member fully pushed home in said first frame member, a stack of pictures against said window, and

said bias means being arranged to lift, with said second frame member being withdrawn from said first frame member into a position defined by stop means, said stack of pictures relative to said second frame member into a position in which it is presented for convenient removal therefrom.

2. A picture viewer as set forth in claim 1



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wherein stop means, to prevent expulsion of the stack of pictures by the bias system once the said second frame member has been withdrawn, are provided at at least one of said frame members at positions opposite to said bias means where the latter act upon said at least one picture urged against said window.

3. A picture viewer as set forth in claim 2 wherein said stop means to prevent expulsion are provided at least at said first frame member.

4. A picture viewer as set forth in claim 2 wherein said stop means to prevent expulsion are provided at least at said second frame member.

5. A picture viewer as set forth in claim 4 wherein stop means to prevent expulsion, remote from said viewing window with said frame members drawn apart, is removable.

6. A picture viewer as set forth in claim 5 wherein said stop means to prevent expulsion comprises a pivotable stop element.

7. A picture viewer as set forth in claim 6 wherein said stop element is arranged to assume two stable positions and is spring biased into either of them.

8. A picture viewer as set forth in claim 1 wherein said bias means comprises leaf springs mounted in said second frame member at about the centre of their



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length and arranged to urge said at least one picture against said window with their two distal ends adjacent respective corners of said one picture.

5 9. A picture viewer as set forth in claim 8 in which said second frame member is of substantially frame-like configuration with struts extending in said direction adjacent lateral side edges of said viewing window, wherein each strut carries one of said leaf springs.

10 10. A picture viewer as set forth in claim 8 or claim 9 wherein said leaf springs extend substantially parallel to said direction and their distal ends projecting to said first frame member when the frame members are fully withdrawn extend into said first frame member.

15 11. A picture viewer as set forth in claim 1 wherein said first frame member is provided with resilient means arranged to present said one engaged picture in front of a stop projection engaging that edge of said one picture which is remote from the remainder of the stack.

20 12. A picture viewer as set forth in claim 1 wherein disabling means are provided to suppress said bias means at least with respect to picture stack edges adjacent said separator element during a first portion of a

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pushing-together stroke of said frame members.

5 13. A picture viewer as set forth in claims 8 and 12 wherein said disabling means comprises extensions of said first frame member disposed and arranged to engage over a portion of said leaf springs during said stroke portion so to deflect said spring portion away from said window.

10 14. A picture viewer as set forth in claim 8 and 13 wherein said leaf springs extend along longitudinal struts of said second frame member and each have a first distal end and a second distal end, and wherein said disabling means are arranged to deflect only those distal ends which, with the frame members being pulled apart, point in direction to said first frame member.
