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Levy

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[54] **EASEL BACK HAVING INTEGRAL SUPPORTING STRUCTURE**

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[52] **U.S. Cl.** **40/124.1**, 40/152.1, 248/463

[51] **Int. Cl.**.....**G09f 1/00**

[58] **Field of Search** ...40/120, 124.1, 152.1; 248/463

[56] **References Cited**

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[57] **ABSTRACT**

An easel back for supporting a photo frame in which the structure includes a backing member, a triangular supporting member and a triangular bracing member all hinged integrally together and with the triangular members folded at the hinges and locked to form a rigid supporting leg of tetrahedron shape. The triangular members are foldable as a unit against the backing member for transport in compact, non-set-up condition. The same supporting tetrahedron serves as a leg to stand the frame for either horizontal or vertical viewing. The parts are preferably molded as a single, or integral, unit employing a plastic having a high degree of flexibility and with scorelines being molded in reduced thickness for facilitating relative bending.

11 Claims, 8 Drawing Figures

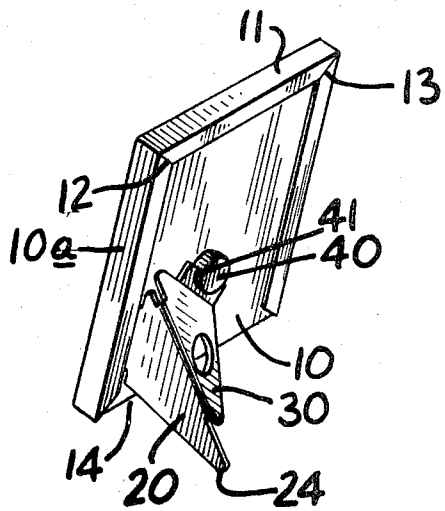


FIG. 1

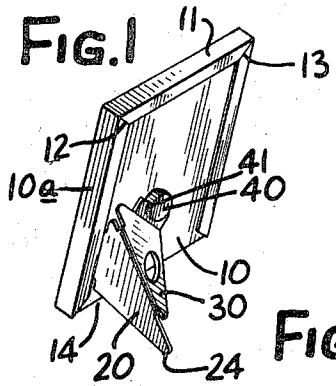


FIG. 4

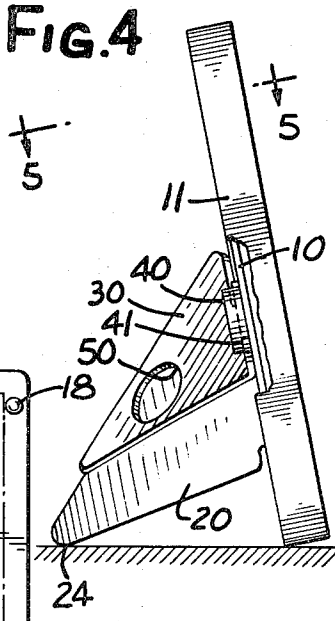


FIG. 3

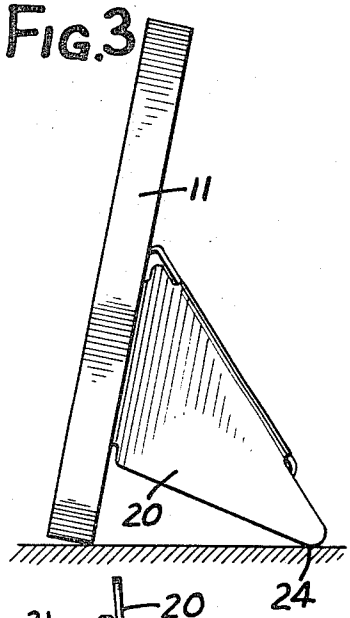


FIG. 2

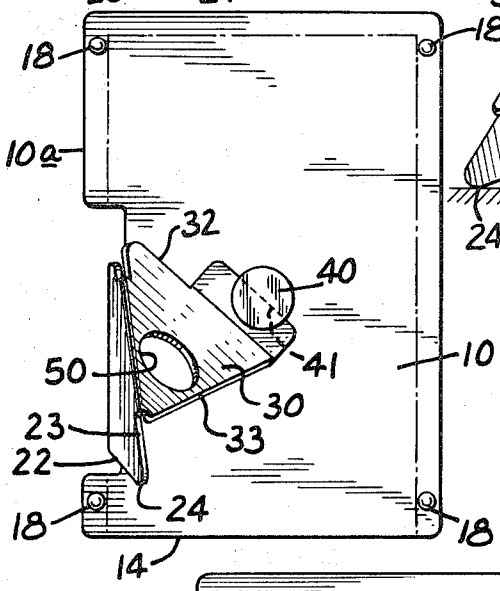


FIG. 5

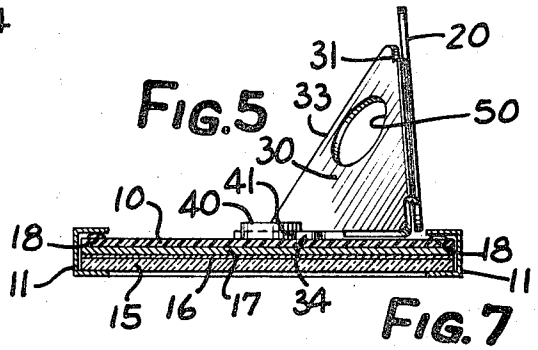


FIG. 7

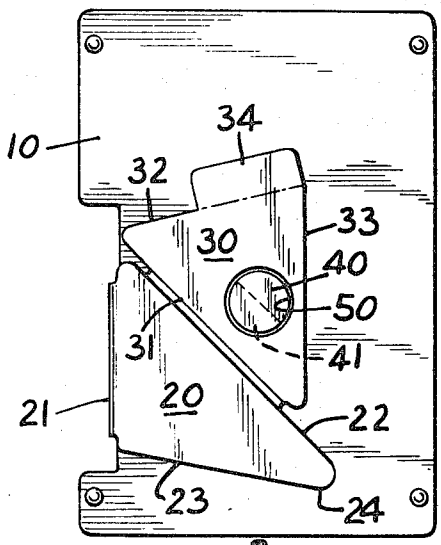


FIG. 6

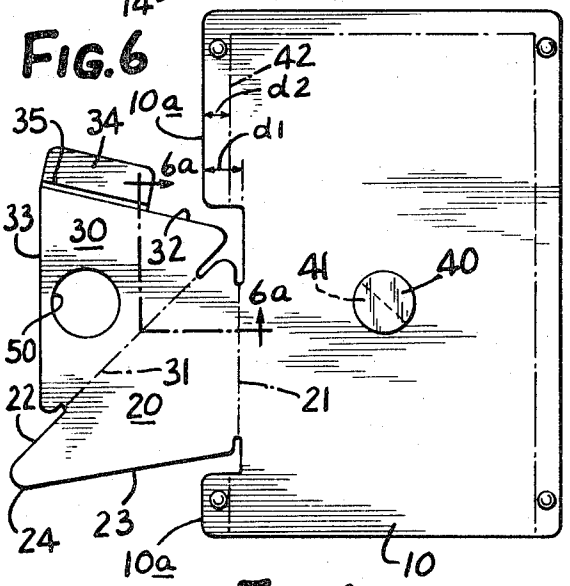
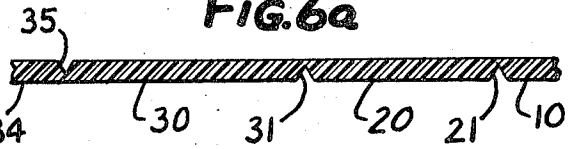


FIG. 6a



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EASEL BACK HAVING INTEGRAL SUPPORTING STRUCTURE

The production and sale of easel back insertable in a frame for display of photographs or the like is a highly competitive business, and the need has existed for a long time for a high quality easel back of sturdy construction made up of a number of relatively foldable parts easily set up by the user but produced in a single, low coast manufacturing step.

It is accordingly an object of the present invention to provide an easel back meeting these requirements, which avoids the "cheap" appearance of conventional backs which have been stamped out of cardboard stock but which may, nevertheless be produced in quantity at a cost equal to or lower than the cost of the cardboard product. It is another object to provide an easel back which has a long useful life and which may be repeatedly set up and collapsed without the hinge deterioration encountered in cardboard construction.

Other objects and advantages of the invention will become apparent upon reading the attached detailed description and upon reference to the drawing in which:

FIG. 1 is a rear perspective view of a photo frame and easel back constructed in accordance with the present invention.

FIG. 2 is a rear face view of the easel back of FIG. 1.

FIG. 3 is a right-hand side view.

FIG. 4 is a left-hand side view.

FIG. 5 is a top view, in partial section, looking along the line 5—5 in FIG. 4.

FIG. 6 shows the easel back of FIG. 2 in its original condition, fresh from the mold.

FIG. 6*a* is a fragmentary section taken along line 6*a*—6*a* in FIG. 6.

FIG. 7 is a view similar to FIG. 6 but showing the supporting structure folded into a nested or flatly overlapping position for transport or when the easel feature is not required.

While the invention has been described in connection with a preferred embodiment, it will be understood that I do not intend to be limited to the particular embodiment shown but intend, on the contrary, to cover the various alternative and equivalent constructions included within the spirit and scope of the appended claims.

Turning to FIG. 1 there is shown an easel back **10** fitted into a frame **11**, the frame per se being conventional and made up of a channel of thin metal mitered at positions **12**, **13** and bent into rectangular shape, being open at the bottom **14**. As shown in FIG. **5**, the width of the opposed grooves defined by the channel cross section is fully occupied by a stack or "sandwich" which consists of a glass outer layer **15**, the photograph or the like **16**, and one or more filler sheets **17** which may be sheets of conventional cardboard, all cut to a size to fit the frame. For the purpose of taking up any remaining space and to insure frictional retention of the stack, the easel back is preferably provided with a set of four knobs or protuberances **18** which bear against the back wall of the channeled frame. It will be apparent that the opposed channels forming the sides of the frame present inwardly facing grooves into which the back **10** slides, from below, with tongue-and-groove engagement.

In accordance with the present invention a triangular supporting member is provided, integrally hinged to the backing member, and a triangular bracing member is provided, integrally hinged to the supporting member, so that they form, in folded condition, a supporting tetrahedron, with means for anchoring one edge of the bracing member to the central portion of the backing member for a rigid locking of the members into the tetrahedron shape. Thus, referring to the drawing, the supporting member, indicated at **20**, has a first edge **21**, a second edge **22** and a third edge **23**. The junction of the edges **22**, **23** are rounded to provide a point of support **24**. The first edge **21** of the triangle **20** is integral with the backing member **10** and is defined by an integrally formed scoreline of reduced thickness to facilitate bending.

Integrally connected to the supporting member **20** is bracing member **30** having a first edge **31**, a second edge **32** and a third edge **33**. The edge **31**, shared by the connected members, is, as shown in FIG. **6a**, also in the form of an integrally molded scoreline for localized bending.

Further in accordance with the invention an integrally molded embossment is provided at the central portion of the backing member presenting a groove which is engaged by a bendable tab integrally secured along the edge **32**. In the present instance the tab, indicated at **34**, has a hinge connection **35** in the form of a scoreline indented from the opposite side of the sheet, permitting the tab to assume a position face-to-face with the back surface of the member **10**. The embossment which receives the tab, and which is indicated at **40**, has an angled groove **41** of semi-circular shape which is adjacent the plane of the backing member. The thickness of the groove **41** is preferably such as to freely accomodate thickness of the tab since the natural resilience of the material at the hinge positions is such as to force the tab more securely into its fully inserted position.

It is one of the further features of the present construction that the hinge **21** at the first edge of the supporting member **20** is spaced inwardly from the adjacent lateral edge of the backing member to provide clearance when the backing member is inserted into the frame in tongue-and-groove relationship. Thus, referring to FIG. **6** the hinge line **21** is parallel to, and is spaced inwardly from, by a distance d1, the left-hand lateral edge **10a** of the backing member **10**. The inward offset is greater than the distance of frame overlap **42** indicated at d2. Thus when the supporting member **20** is bent out of the plane of the backing member **10** there is adequate clearance for free insertion of the backing member into the frame.

Still further in accordance with the invention an aperture, or cutout **50** is provided in the bracing member **30** so that when the members **20**, **30**, **34** are bent as a unit, through an angle of 180°, the supporting structure is nested flatly against the surface of the backing member with the embossment **40** mated with the cutout. If desired, the cutout **50** may be sized to snuggly embrace the embossment or may be slightly detented with respect to the embossment when in folded condition so that the supporting structure snaps over the embossment with detent action. However, it is found that even without detenting, the supporting

structure tends to lie flatly against the backing member as shown in FIG. 7, providing a high degree of compactness when the structure is transported and until easeled support is required.

In use the supporting structure is flipped from the condition shown in FIG. 7 and the two triangular members **20, 30** are bent along the hinge lines **21, 31** so that they and the backing member together form a supporting tetrahedron with the tab **34** being inserted edgewise into the groove **41** to lock the members in their supporting positions. Setup takes but an instant and is sufficiently straightforward so that it may be carried out by either adults or children without necessity for any assembling instructions.

The present construction is ideal for photo frames intended for portable usage and requiring repeated bending at the hinge lines. Preferably a flexible plastic such as polyethylene is used, permitting many hundreds or even thousands of bending cycles without noticeable deterioration. Thus the construction is to be distinguished from easels formed of cardboard sheet stock punched and scored as in conventional designs. An easel back of the present construction, integrally molded in plastic, not only is more durable than its cardboard counterparts but it gives the impression of quality and durability avoiding the "cheap" appearance associated with use of conventional cardboard, even though the cost of manufacture does not, in quantity production, exceed the cost of the cardboard which it replaces.

It is one of the features of the present construction that the point of easeled support **24** is spaced inwardly about the same amount from two adjacent lateral edges, permitting a photograph in the frame to be viewed either vertically, as shown in FIG. **1**, or horizontally. Thus when the frame is vertical and supported along the bottom edge **14**, the remote edge **24** of the supporting member **20** bears edgewise against the supporting surface. When the frame is turned so that the side **10***a* of the backing is lowermost, the region **24** still acts as a point of outboard support, but in a plane at 90° to the original plane of support.

While it is preferred to employ a well-defined scoreline **31** between the supporting member **20** and bracing member **30** for abrupt hinging action, it will be understood that the invention in certain aspects is not limited thereto and contemplates the possibility of having a gradual curving bend in the region **31** providing a gradual transition between the angled surfaces when the device is set up, making use of the flexibility of the plastic material of which the assembly is made. This would, of course, cause the supporting tetrahedron structure to present a rounded rather than relatively sharp upper edge, but the rigidity and security of the support, provided the tab **34** is securely tucked into the embossment **40**, would remain unaffected. Accordingly, the term "hinge," as used herein, is to be broadly interpreted as a region where bending takes place incident to set-up without limitation as to the sharpness of the bend.

It will be apparent, with the above teachings in mind, that other minor changes may be made in the construction without departing from the invention. Thus the two triangular members **20, 30** may be altered in size or effectively shifted with respect to one another along the common hinge line **31**. If desired, the edge **33**, may be extended to the left (FIG. **6**) so that both of the triangles have an apex at the region **24** for maximum strength and rigidity. Then too, the member **30** may be further increased in size, with extension along the line of the hinge **31** as viewed in FIG. **6**, so that the member **30** extends beyond the point of support **24**, whereupon the apex of the triangle **30** will engage the supporting surface. Alternatively the triangles **20, 30** may be trimmed, for example, to eliminate, in one or both, the portion which is above and to the right of the section line **6a-6a** in FIG. **6** thereby converting the triangles to members more aptly characterized by the term "truncated triangles" or "trapezoids." Thus the term "triangular" as used herein includes within its scope truncated triangles, and the term "tetrahedron" includes within its scope truncated tetrahedrons.

The term "sharply angled" used in defining the bent positions of the members **20, 30** refers to an included angle, at the hinge **31**, which is preferably acute but which does not, in any event, greatly exceed a right angle.

What I claim is:

1. An easel back for supporting a photo frame, comprising, in combination, a rectangular backing member having lateral edges, a triangular supporting member having first, second and third edges, the first edge of the supporting member having a hinge connection with a lateral edge of the backing member, the hinge at the first edge of the supporting member being spaced inwardly from the adjacent lateral edge of the backing member and arranged parallel thereto to provide clearance for the cooperating edge of the frame when the backing member is inserted into the frame in and groove relationship, a triangular bracing member having first, second and third edges, the first edge of the bracing member having a hinge connection with the second edge of the supporting member, the hinge connection permitting the triangular members to be bent into tetrahedron shape with a projecting point of the tetrahedron defining a point of easel supporting which is behind the backing member and spaced inwardly from a lateral edge thereof, and means for anchoring the second edge of the bracing member to the central portion of the backing member to rigidfy the tetrahedron.

2. The combination as claimed in claim **1** in which a hinged tab is provided on the second edge of the bracing member and in which means are provided on the backing member for engaging the tab.

3. The combination as claimed in claim **2** in which the central portion of the backing member has formed thereon an embossment defining a groove adjacent the plane of the backing member for receiving the tab.

4. The combination as claimed in claim **3** in which the bracing member has an aperture formed therein for matingly receiving the embossment when the supporting member, bracing member and tab are folded as a flat unit about the hinge on the first edge of the supporting member to lie flatly against the backing member for transport.

5. The combination recited in claim **2** in which the members are all formed of flexible plastic integrally with one another with the hinges being in the form of scorelines defining regions of reduced cross section for localized bending between the members.

6. The combination as claimed in claim 1 in which the point of the tetrahedron projects behind the backing member and is spaced inwardly from both adjacent edges on the backing member by approximately the same amount for tilting support about either one of the adjacent edges.

7. The combination as claimed in claim 1 in which the supporting member extends beyond the bracing member at the hinge between the two members so that the supporting member engages the supporting surface.

8. An easel back for supporting a photo frame, comprising, in combination, a rectangular backing member having lateral edges, a triangular supporting member having first, second and third edges, the first edge of the supporting member having a hinge connection with a lateral edge of the backing member, a triangular bracing member having first, second and third edges, the first edge of the bracing member having a hinge connection with the second edge of the supporting member, the hinge connection permitting the triangular members to be bent into tetrahedron form with a projecting point of the tetrahedron defining a point of easel support which is behind the backing member and placed inwardly from a lateral edge thereof, a hinged tab provided on the second edge of the bracing member, an embossment formed on the central portion of the backing member and defining a groove adjacent the plane of the backing member for receiving the tab to rigidfy the tetrahedron, said bracing member having an aperture formed therein for matingly receiving the embossment when the supporting member, bracing member and tab are folded as a flat unit about the hinge on the first edge of the supporting member to lie flatly against the backing member for transport.

9. The combination as claimed in claim 8 in which the hinge at the first edge of the supporting member is spaced inwardly from the adjacent lateral edge of the backing member and arranged parallel thereto to provide clearance for the cooperating edge of the frame when the backing member is inserted into a frame in tongue-and-groove relationship.

10. The combination as set forth in claim 8 in which the members including the mating aperture and embossment are all molded of plastic integrally with one another with the hinges being defined by scorelines of reduced cross section between the members.

11. A photo frame and support assembly comprising, in combination, a rectangular frame defining grooves in the opposed edges thereof, a rectangular backing member having lateral edges for slidable tongue-and-groove reception in said grooves, said backing member having a supporting member hinged to the backing member and having a bracing member hinged to the supporting member with the supporting and bracing members having provision for locking in place to form a rigid outboard support for supporting the frame in tilted position along one of its edges, the members being formed of flexible material integrally with one another and the hinges being formed by scorelines defining regions of reduced cross section, the hinge between the backing member and supporting member being parallel to the adjacent lateral edge of the backing member but being offset inwardly from said lateral edge to permit free insertion of said lateral edge into the cooperating groove.

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