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(54) **MODULAR FRAME SYSTEM**

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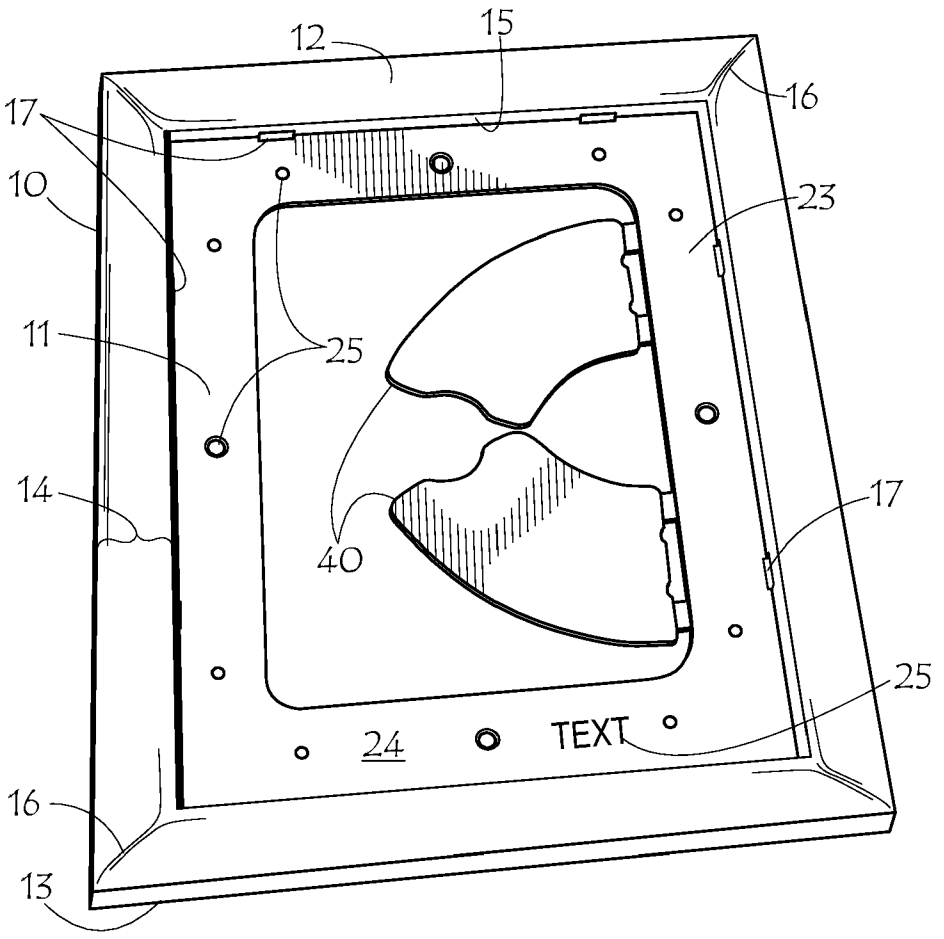
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(57) **ABSTRACT**

A modular frame system includes of one or more frame bodies **10** of injection molded plastic and a removable image holder **20** mounted on the interior perimeter surface of the frame body bezel by deflectable ridges or tabs **33**. The frame body preferably includes integrally molded removable props **40** for holding the frame horizontally or vertically on a horizontal surface at about sixty-four degrees. The frame body bezel **12** include hollow portions **19** to receive specially formed connectors **50** so that a plurality of frame bodies can be precisely interconnected preferably for wall display and to store the connectors when not being so used. Frame body includes an inner portion **23** with a broad back surface **26** for adhesive hook-and-loop fastener **27** attachment to a wall. The image holder includes upstanding perimeter walls **31** to define a volume for holding a plurality of flat lamina such as photographs **62** backing cards **60** and aperture mats **61**.



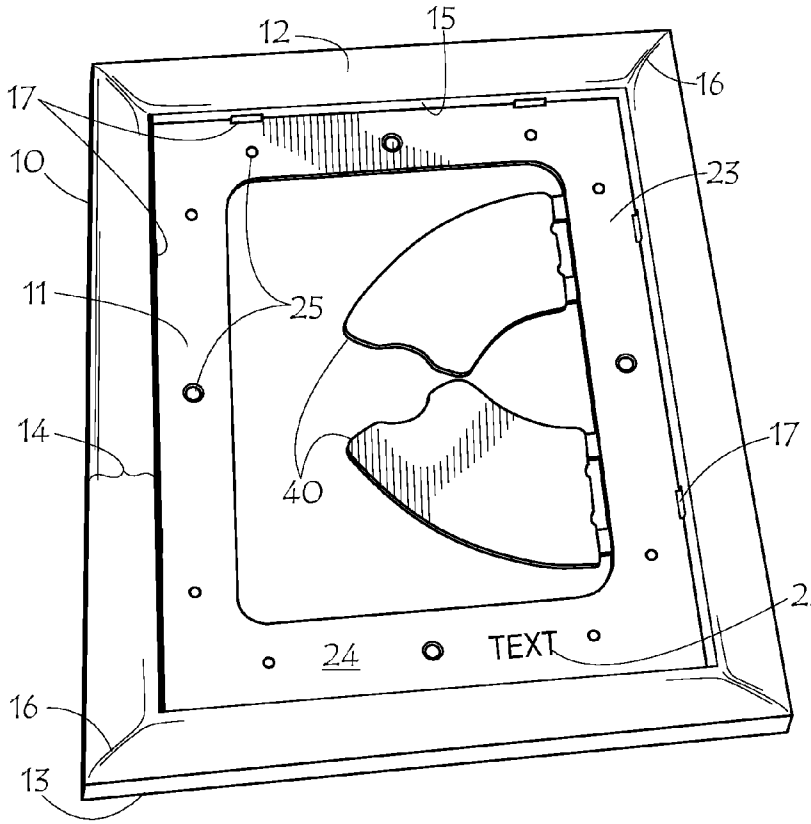

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17
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11
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40
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TEXT
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13

FIG. 1

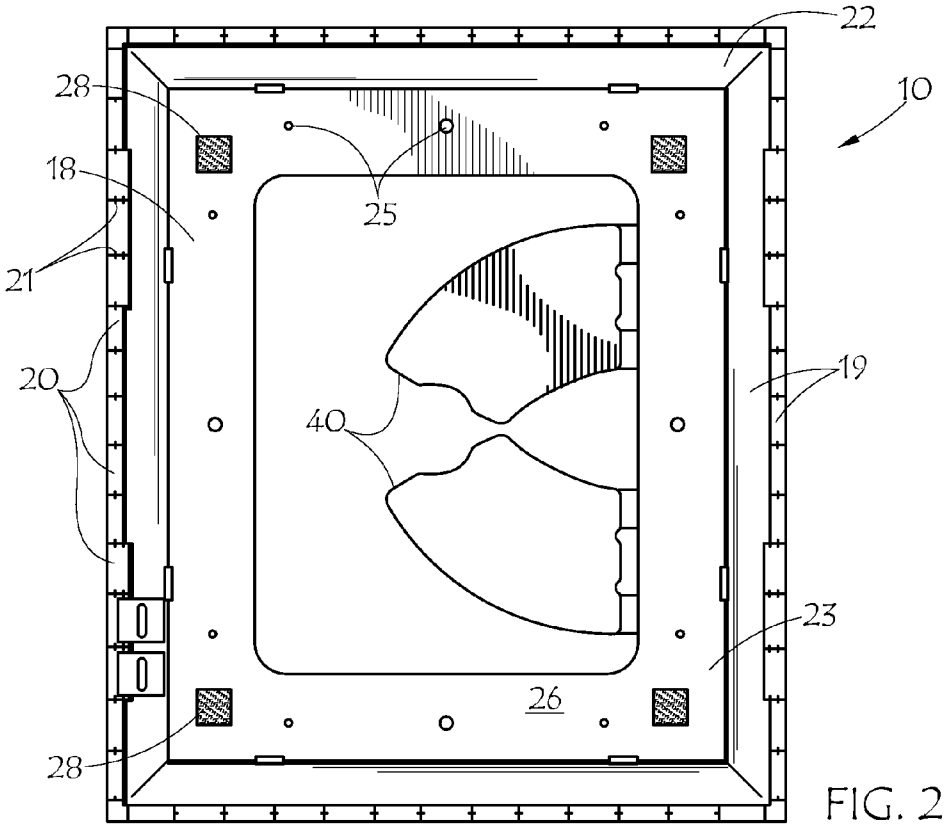

22
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40
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26
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FIG. 2

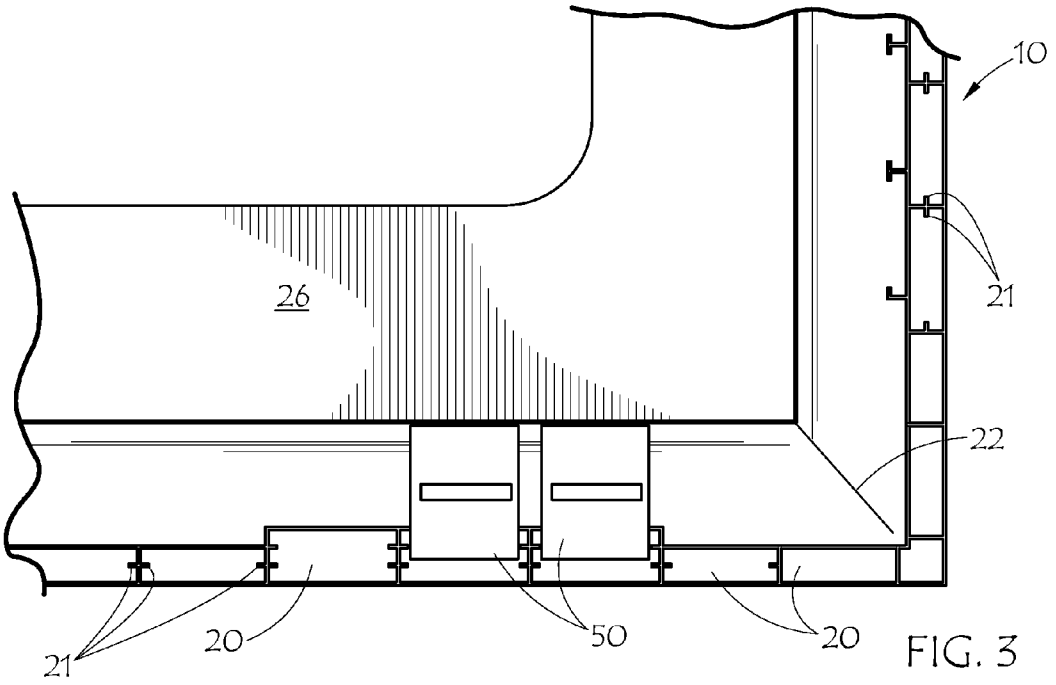


FIG. 3

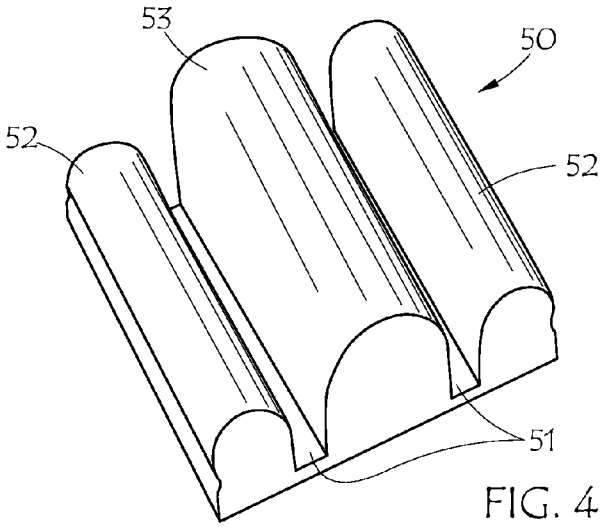


FIG. 4

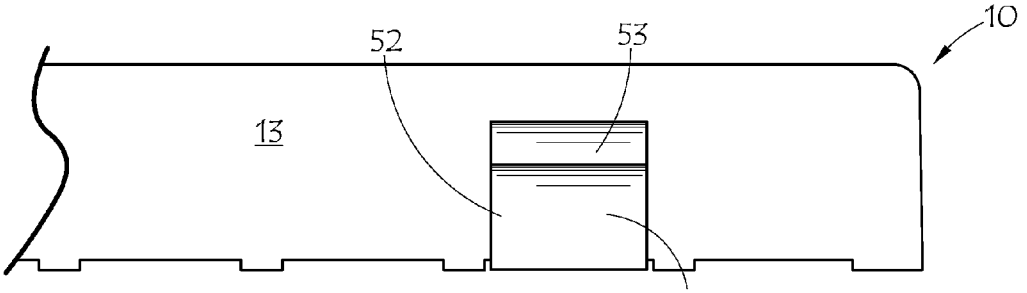


FIG. 7

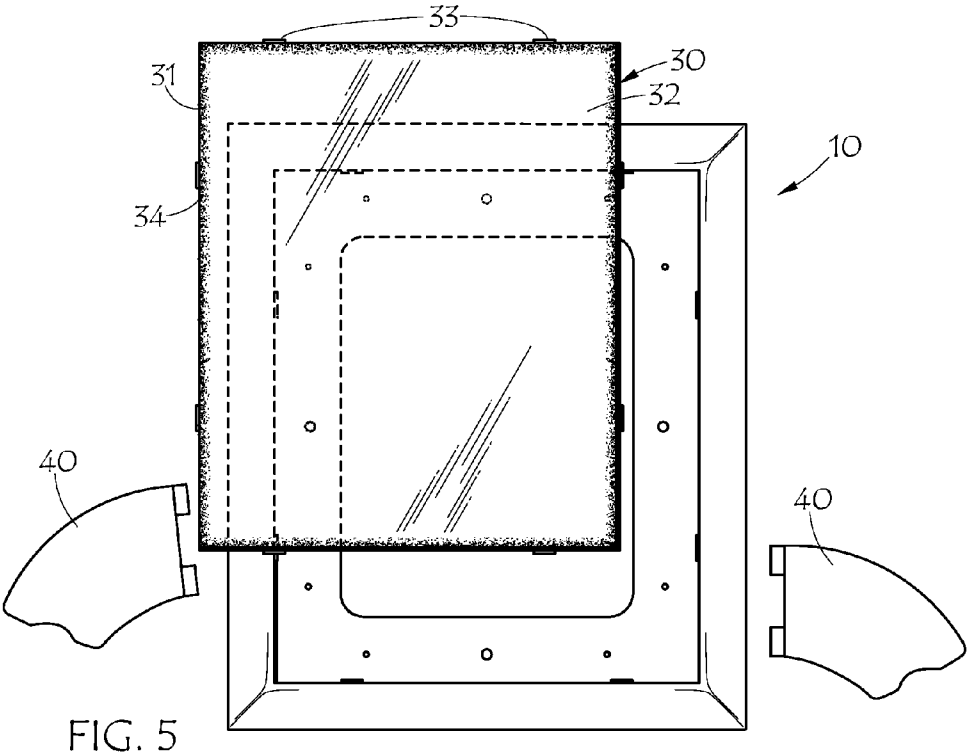


FIG. 5

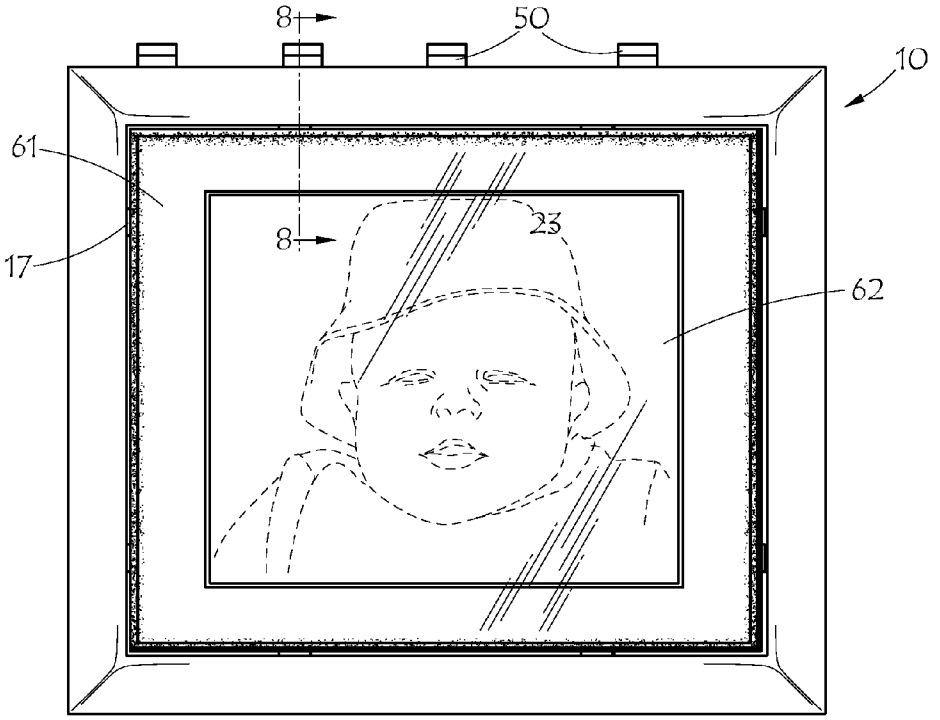


FIG. 6

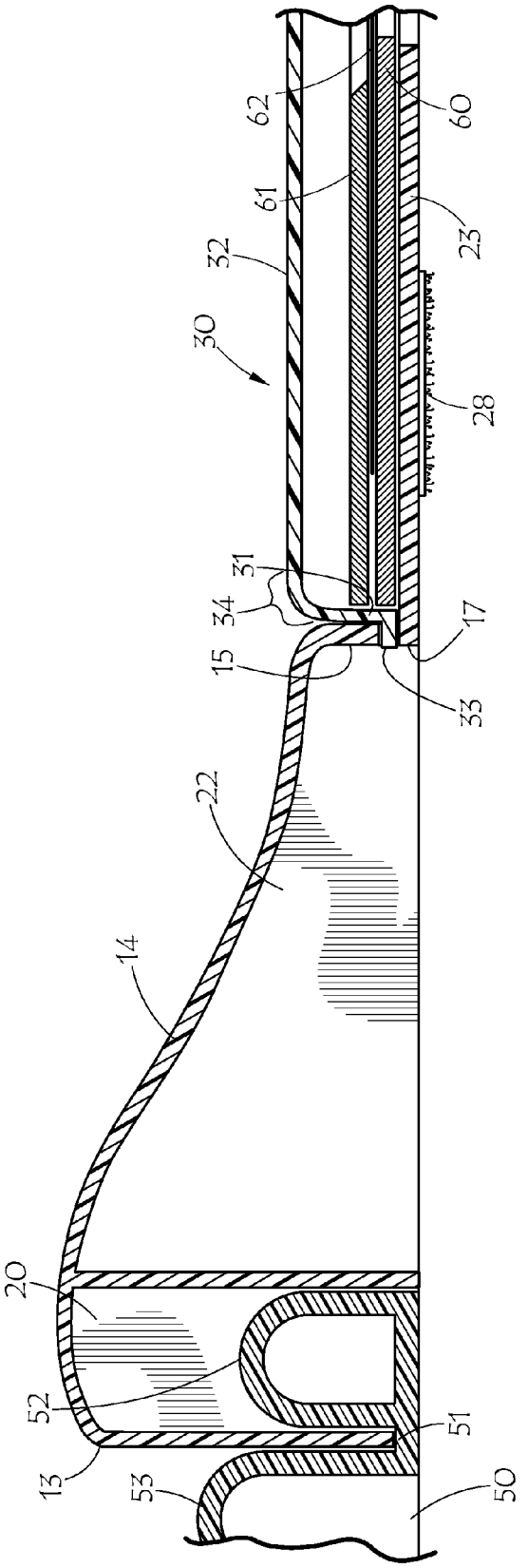


FIG. 8

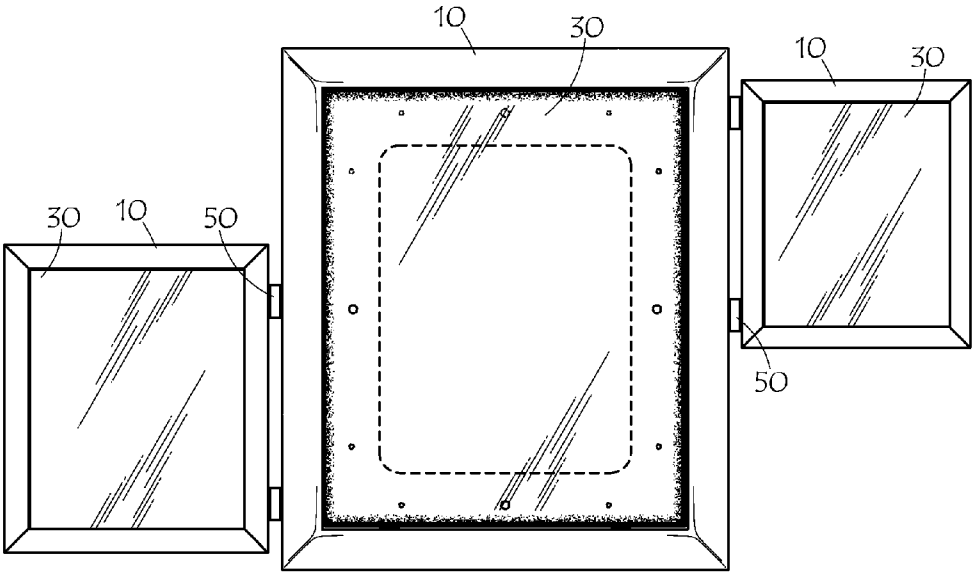


FIG. 9

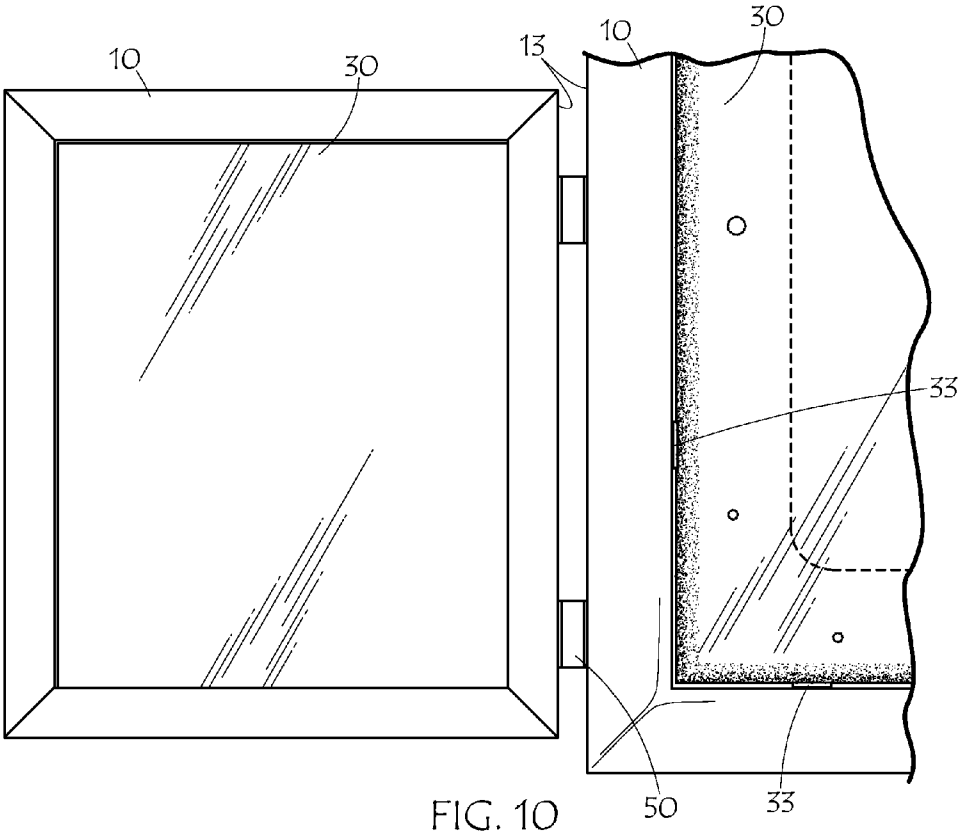


FIG. 10

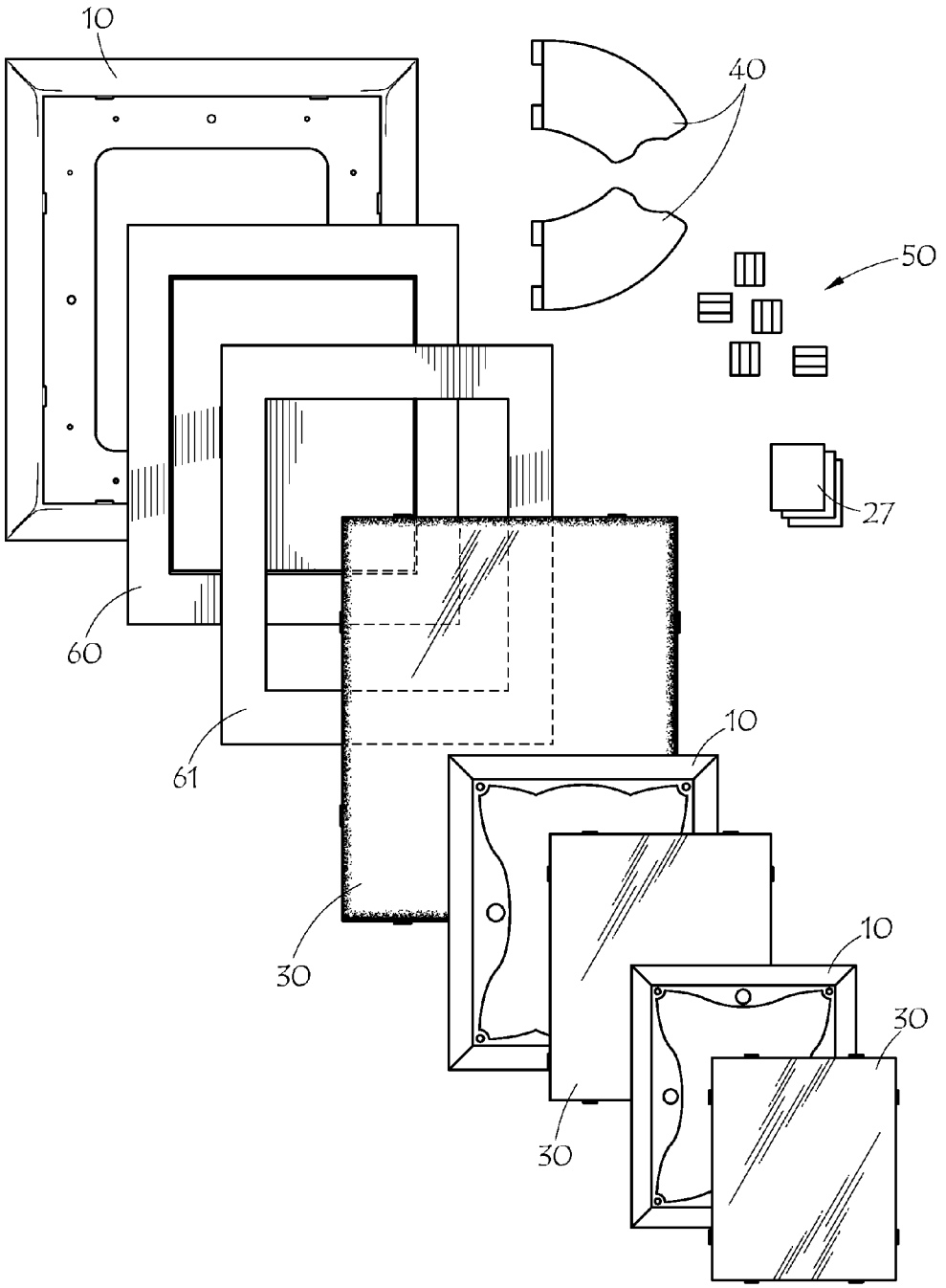


FIG. 11

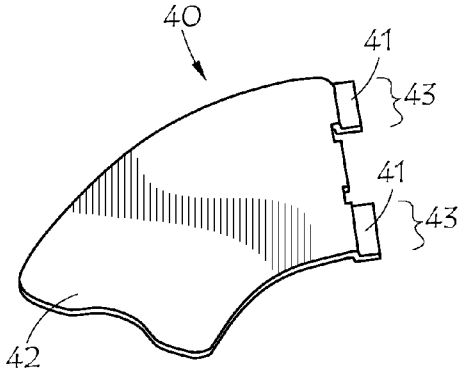


FIG. 12

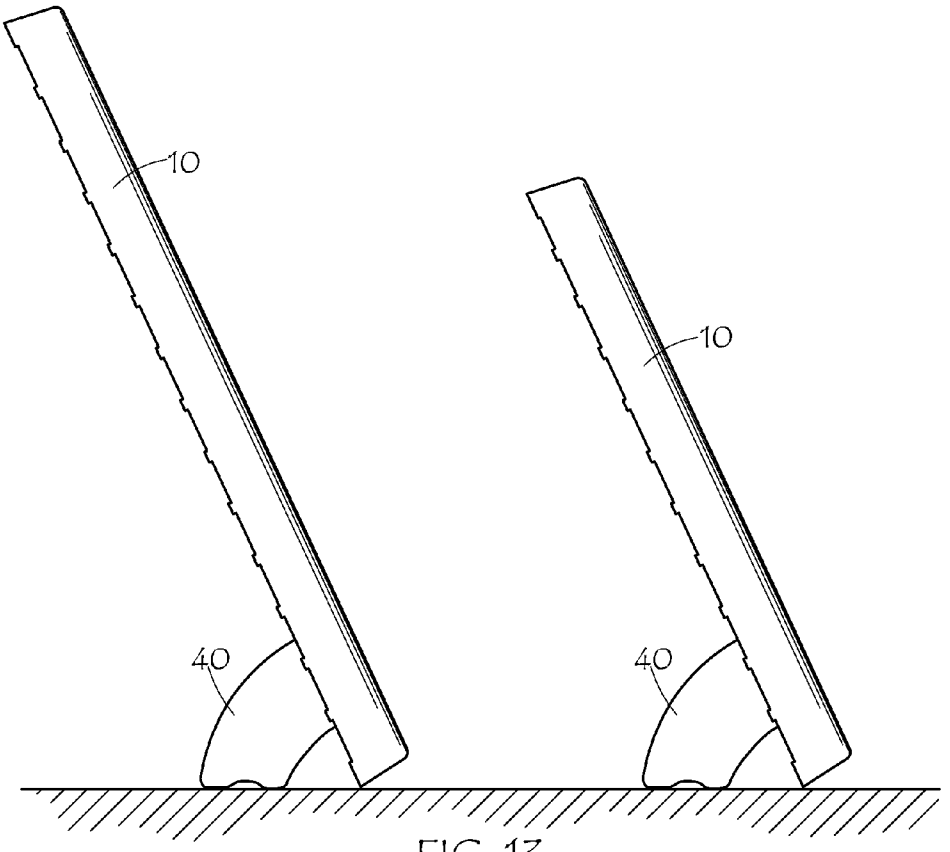


FIG. 13

MODULAR FRAME SYSTEM

[0001] This application is a continuing application of co-pending U.S. application Ser. No. 11/106,235 filed Apr. 14, 2005, and provisional patent application Ser. No. 60/953,451 filed Aug. 1, 2007, all of which are hereby incorporated by this reference in their entireties.

TECHNICAL FIELD

[0002] The present invention relates to a system of picture framing, and in particular picture frames that can be grouped together precisely and mounted on a wall or alternatively supported together or individually on a desk or other flat surface. This inventive concept further relates to a system of displaying almost any generally flat graphic works including pictures, papers with text and/or graphics of almost any type, hereinafter called images, as well as storing a number of similar flat images simultaneously in the modular frame system.

BACKGROUND ART

[0003] There have been a number of picture frame systems in the past that included a frame structure of injection molded polymer. One example is shown in PCT/US/89/04500 filed 12 Oct. 1989. That frame has an integral outer margin and a flexible clear laminate cover (FIG. **8**) that snaps into the inner margins of the frame. Another prior art frame is shown in U.S. Pat. No. 6,705,034, where an integrally molded frame also has a transparent cover sheet which is removable from the front of the molded frame. Neither of these prior patents discuss the problem of storing multiple images nor of keeping all the parts of a modular framing system conveniently together while in use.

SUMMARY DISCLOSURE OF THE INVENTION

[0004] The invention includes a modular picture frame system that includes a rectangular frame base of a predetermined overall rectangular dimension. The base includes a surround with a substantial depth dimension which defines an inner perimeter and an outer perimeter in a general rectangular shape, an image holder removably mountable within the inner perimeter of the base. The image holder has a generally planar, transparent front through which an underlying image can be viewed, and at least one upstanding wall integrally formed with the transparent front and extending from the plane of the transparent front. The upstanding wall has a detent on a distal end which is sized to releasably engage the inner perimeter of the frame body surround. The upstanding wall is sized to define, together with the transparent front, a cavity with a depth dimension adequate to contain and store at least several thicknesses of paper-based images when the surround is engaged by the wall detent. The image holder preferably has a translucent perimeter portion around the edges of the transparent front. This translucent perimeter is dimensioned such that at least the wall detent is partially obscured when viewed through the translucent perimeter portion.

[0005] More particularly, this translucent perimeter has a surface texture which obscures the edge portions of an image viewed through the transparent front. When the image is a photograph with reorder information printed on and around on the edge portions of the photograph, this reorder information underlies the translucent perimeter. Furthermore the perimeter has corner edges that connect the generally flat front with the edge portions, with these corner edges are rounded to an outer radius of around one-quarter inch.

[0006] The modular framing system includes at least one connector sized and shaped to releasably attach one frame body to a similarly constructed frame body when the two frame bodies are mounted on a wall or the like. Each of the frame bodies includes cavity extending into the surround from the backside thereof. The cavity in the frame body of at least one of the frame bodies is sized to store at least one connector.

[0007] The inventive modular frame system is constructed to be front loading, that is, the frame body need not be removed from its attached condition on the wall when removing or placing an image within the image holder. Preferably the modular frame system includes a hook and loop fastener adhesively adhered to the back of the frame body such that the modular frame system can be attached to a wall surface but removable therefrom. While the frame body is attached to the wall by the hook and loop fastener the image holder can be removed from the front of the frame bodies to permit changing the image to be displayed through the transparent front of the image holder without having to detach the frame body from the wall.

[0008] The image holder of this inventive concept defines a cavity by the integral edges having a depth, this cavity being adequate to store several thicknesses of image materials. In particular the depth of this cavity is adequate to store up to twenty photographs of conventional thickness, or up to fifteen such conventional photographs and two layers of three-ply mat board.

[0009] The front or consumer viewable side of the frame body is preferably float coated with a decorative, preferably opaque coating. The frame body has preferably two props or supports sized and shaped to stand the frame body upright on a horizontal surface such as a desk. These supports are integrally molded to an edge of a generally flat frame body interior and are positioned towards the center of the rectangular shape of the frame body. The frame body has at least one cavity of the cavities in the back surface of the frame body sized to grippingly receive an end of each support.

[0010] These supports or props include a horizontal surface engaging edge and a connector edge. The connector edge has an L-shape in cross section whereby when the desk prop is inserted in the frame body cavity, the support is held perpendicular to the overall plane of the frame body but positioned coplanar with the adjacent outer most perimeter edge of the frame body. The support is shaped such that when assembled it holds the frame body at approximately 64 degrees from the horizontal surface on which the supported frame is placed.

[0011] Preferably the modular frame system includes several of the aforementioned connectors. Each of these connectors has two ends and each of the ends sized to fit snugly into at least one cavity on the back side of the frame body, and a middle portion positioned between the two ends. The middle portion is sized to precisely space a frame body from a similarly constructed frame body when the two frame bodies are connected to the ends of a connector. This arrangement has the advantage such that when one picture frame assembly is mounted on a wall with connectors in place, the similarly constructed frame when connected to the connectors will be positioned precisely relative to the first frame. In particular if the first frame is level i.e. the top and bottom sides are horizontal, the thus connected frame will be also level and hori-

zontal. In order to increase the versatility and number of aesthetically pleasing arrangements for plurality of these inventive frames, each of the four perimeter edge portions has appropriately sized cavities in its back sized to receive the ends of these connectors. These edge portions include a another cavity adjacent to these first cavities sized to store the connectors such that the connector's ends and middle portions are out of sight when the frame is mounted on the wall or the like.

[0012] The frame body has an interior flange extending from the inward facing edge at the back face of the perimeter frame. This interior flange has a broad front surface and a similarly broad rear surface. The front surface includes a graphic information in the form of a embossed or de-bossed text or graphics on the front of the surface, including such information as reorder information, legal legends and the like. This information is thus readable through the opaque or decorative surface treatment provided by the float coating. The back, broad surface of this interior flange has markings for locating the adhesive hook and loop fasteners as well as apertures for use with a penetrating nails, screws or other such conventional wall fasteners.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. **1** shows a modular picture frame as seen from the front or consumer side thereof, including a pair removable, integrally molded desk supports.

[0014] FIG. **2** shows a rear view of the modular picture frame including two stored connectors.

[0015] FIG. **3** is a close-up view of the lower left corner portion of the modular picture frame of FIG. **2**.

[0016] FIG. **4** is a perspective view of a connector.

[0017] FIG. **5** is an exploded view of the modular picture frame system including the transparent image holder.

[0018] FIG. **6** is an orthographic view of an assembled modular picture frame with connectors inserted along an edge of the frame body.

[0019] FIG. **7** is a close up side view of the edge of a frame body showing a connector.

[0020] FIG. **8** is a partial cross section of a portion of the image holder taken along line **7-7** of FIG. **6**.

[0021] FIG. **9** shows three frame bodies connected to each other with connectors.

[0022] FIG. **10** shows a portion of two frame bodies connected together with connectors.

[0023] FIG. **11** is an exploded view of the modular frame system showing typical collection of its parts as shipped to the consumer.

[0024] FIG. **12** is a detailed view of a support tab or prop.

[0025] FIG. **13** two frames supported with tabs (not to scale) on a horizontal surface.

BEST MODES FOR CARRYING OUT THE INVENTION

[0026] The modular frame and the system of modular frames comprise at least one frame base or body **10**, and preferably three such frame bodies, each manufactured in a different overall size to accommodate three different sizes of graphic works or images **62**. By images it is meant the usual laminar, typically paper-based image bearing media such as photographs, documents, pencil or pen sketches, and other graphic representations. Such images could also be naturally occurring items of aesthetic or historical significance such as leaves, pressed flowers, and other relatively broad, thin objects that would be appropriate to place below a pane of glass such as is usually used to display such articles within a surrounding frame bezel. In the preferred embodiment these frame bases accommodate images having overall dimensions of up to a maximum of 8"×**10**", **5**"×**7**" and 4"×6". Of course the larger e.g., 8×10 frame base can accommodate items smaller than 8"×10" through the use of an aperture mat as will be detailed below.

[0027] In more detail the frame base has a front or forward facing surface **11** that usually predominates when the modular frame is being used to display an image on a desk or other horizontal surfaces, and preferably when mounted on a vertical wall surface. This front surface **11** is dominated by a molded bezel **12** which forms the overall rectangular surround **12** of the frame. The molded bezel preferably has a generally vertical upstanding outer perimeter **13** and artistically inwardly tapering front surface **14**, which terminates at an inner edge **15**. The tapering front surface **14** could be further embellished or decorated with classical details, e.g. ball and spindle, scallops, but most preferably it is merely an ogee, that is with a smoothly curving S-shaped profile. Each side of the generally rectangular surround intersects at a corner **16** that has a smoothly filleted miter intersection. formed when the frame body **10** is injection molded into a one piece frame.

[0028] On the inward facing surface of the inner perimeter of this molded body **10** includes a plurality of slots or indentations **17** which are used to releasably engage the image holder as will be detailed below.

[0029] Each frame base has a back side **18**. This back surface is generally not visible when the frame is mounted on a wall and is only incidentally visible when the frame might be displayed on a desk or the like. This back **18** has hollow sections **19** extending around the perimeter of the molded bezel. These hollow sections are divided into generally overall rectangular cavities **20**, some of which have protrusions **21** projecting inwardly from dividing walls. As least some of these cavities **20** are sized to snugly receive and hold a portion of specially formed connectors. These hollow sections **19** also include a hollow perimeter portion **22** inboard of the rectangular hollow sections. This hollow perimeter provides two main benefits. It reduces the amount of polymer or other material from which the frame body **10** is formed, but it also provides adequate storage space to receive a plurality of the special connectors and thus serves as an integral, convenient, and generally hidden storage space for the unused connectors, even when the modular frame is being used to display images.

[0030] Visible from both the front and back, the frame body **10** has an interior flange **23** that presents a broad rectangular surface **24**. This surface preferably has a number of through holes **25** which are sized and positioned to conveniently receive penetrating fasteners such as screws and nails (not shown) for holding the modular frame to the wall, although this is not the preferred method of fastening frame system to the wall. The broad surface **24** facing outwardly has an important function in addition to the above, that is to receive molded-in text or graphics **25** either protruding (de-bossed) or embossed into the surface during molding via removable mold inserts. This system permits the manufacturer to include important technical and legal information readily visible to the user even when the frame body **10** is affixed to a wall. Such information may include the name of the manufacturer, the model of the frame body **10**, and contact information for

reordering replacement parts and the like. Its important to note that this text information is in the form of a texture so that the frame can be given a pleasing opaque coating over its front facing surfaces, as will be detailed below, but this information will not be obscured in this coating process.

[0031] The back side **18** of the frame body **10** interior as stated above presents a broad flat surface **26**. This surface is sized to receive one or more adhesive attaching means **27**, preferably of the hook-and-loop fastener type. It is preferable that the hook portion **28** of the hook-and-loop fastener **27** would be adhered to this back surface **26** located on the corner portions thereof, these locations being indicated by molded-in markings or the like. Once in place, the hooked portions attach well to the textile covering of office cubicles and the like, thus providing the office worker for convenient way to decorate their work cubicles. Otherwise, the loop portion of each hook and loop fastener can be positioned onto a vertical wall surface (not shown) to releasably hold the assembled modular frame system in position.

[0032] Removably mountable within the interior perimeter edge **17** of the frame body **10** is the image holder **30**. The image holder is injection molded of a water clear engineered polymer material such as an acrylic optical-grade polymer, a polycarbonate resin marketed under the brand "LEXAN" by GE Plastics, or the like. Preferably the polymer material has a UV absorbing additive to help protect the images displayed through the transparent center portion from light-induced degradation. The image holder **30** includes a perimeter wall **31** that extends around all four sides of the transparent center portion **32**. Each of the four perimeter wall portions includes preferably two ridges or tabs **33** that are resilient enough to pass along the inner perimeter of the frame body **10** and snap into the indentations **17** when the image holder **30**, loaded with images, etc., is being mounted to the frame body **10**. To remove the image holder **30** from the frame body **10**, a thin tool or credit card can be inserted between the inner edge **15** of the frame body **10** and the upstanding wall **31** (see FIG. **8**) to push a resilient tab **33** away from the receiving indentation **17** to permit removing the image holder **30** for changing the displayed image or, as will be detailed, for storing additional images within the perimeter walls of the image holder. The image holder **30** includes an obscuring edge **34** preferably in the form of a frosted texture (in contrast with the highly polished water clear surface of the center portion). This obscuring edge preferably consists of a frosted texture on both of the inner and outer surfaces at the perimeter of the image holder. This has the effect of obscuring the molded-in tab **33**, thus somewhat disguising from the casual viewer the mechanics of how the image holder attaches to the frame body. The user of the frame can still see the tabs enough to insert the thin tool at the tabs **33** to deflect the tabs from their corresponding indentations **17**. Providing this frosted texture on the perimeter, especially on the inside surfaces, also simplifies manufacturing, since the injection mold tooling need not be polished to the optical quality necessary for the proper transparency required in the central portion **32** of the image holder **30**.

[0033] Often certain images, especially school or team photographs, include reorder information in the form of a multi digit code printed on the front face of the photographic image very near an edge. This reordered code is not aesthetically pleasing. Accordingly the image holder's obscuring edge **34** could be made even less transparent through the use of a very aggressive prismatic texture. This has the effect of obscuring this reordered information such that the user is not tempted to cut off the reorder information and thus frustrate the advantage of having the reorder code affixed to the corresponding image. Also, this obscuring edge **34** eliminates the need for making or providing a aperture mat or mount to hide the reorder information or the raw and sometimes jagged edges of a paper image.

[0034] While wall mounting of the modular frame systems is preferred, support tabs or desk props **40** are provided. These are integrally molded to the innermost edge of the frame body interior flange. Each of these tabs have a connection end **41** and a support end **42** which form a predetermined angle there-between as will be detailed. The connector end is L shaped in cross section. The outermost edge **43** of the connector end is sized to fit into the rectangular hollow sections between protrusions **21** arranged in the cavities **19** on both the long and short sides of the rectangular frame body. Note that the L-shape of the connector **41** protrudes toward the front face of the frame body when the props **40** are initially integrally molded therewith. This places the outward facing side of the props **40** such that when the integrally molded frame body and props are coated or painted, as for example in float coating or spray coating, these surfaces are particularly given a coating aesthetically consistent with the painted frame bezel **12**. The L-shaped connection ends **41** position the thus coated surface of each prop substantially coplanar with the surface of the adjacent outer perimeter **13** of the frame body. In this way when the frame body and support props **40** are assembled for display on a horizontal surface such as a desk, the supports aesthetically blend with the frame bezel. The support edge and connector edge are such that, in combination with precisely positioned hollow sections/protrusions on the backside of the frame previously described with reference to FIGS. **2** and **3** for example, the frame body **10** will be held at approximately sixty-four degrees from horizontal regardless of whether the frame is supported in the portrait or landscape orientation. This is illustrated in FIG. **13** where two frames, one with its longer dimension horizontal (that is, in a landscape orientation) and the other with its shorter dimension horizontal (that is, in a portrait orientation) are each supported at the desired sixty-four degree angle by identically dimensioned props **40**.)

[0035] The modular frame system includes a special connector **50** which shown in greater detail in the above mentioned prior U.S. application Ser. No. 11/106,235 which is incorporated herein to the extent and is consistent with this disclosure. Each connector **50** is preferably injection molded from a generally transparent or translucent polymer and consists of three main portions interconnected by a small web **51**, these portions comprising two ends **52** and a middle portion **53** which protrudes up from the web **51** between the two ends. The figures show the connectors **50** in different combinations with the frame body, as will be detailed. In general though each connector, when connecting two frame bodies of the modular frame system, space each frame body by a precise thickness of the middle portion **53** of the connector then the ends are plugged into and frictionally engage the appropriately sized hollow sections **20** on the back of the frame bodies. Also, at least with regard to the larger of the frame bodies, multiple connectors **50** store neatly by frictionally engaging one of the end portions into one of the rectangular cavities **20** with the rest of the connector positioned in the hollow perimeter **22**. This provides convenient storage place for such connectors when they are not being used interconnect a number

of frame bodies. In this way the consumer will always have the connectors available for subsequent connecting or rearranging the interconnected frame bodies.

[0036] Preferably the modular frame is sold as a complete system in a neatly and easily shipped package. The package preferably includes three frame bodies **10** with the appropriately sized image holders **30** for each of the frame bodies (8×10, 5×7 and 4×6). Each of the thus sized image holders include a backing card **60** of conventional one to three ply card stock and at least one preferably two aperture mounts **61**. The image holder has a depth dimension as determined by the distance the perimeter wall **31** stands up from the back of the transparent center portion **32**. This dimension should be at least such that it can contain at least the backing card, one aperture mount and one image (photograph, document, etc.). Preferably this depth dimension should be around 0.25 inch such that each of the image holders can hold and store a backing card, an aperture matt board mount, both of the desk props and around twelve standard thickness paper based images, or twenty standard thickness photographs without the apertured mount. In this way this modular frame system provides not only a means for displaying a selected image but a convenient place to store all the accessories necessary to or desired to change the method of display (from wall to desk mounting and from individual frame display to interconnected frames) as well as a plurality of related or unrelated images, as long as the images have a fairly small thickness dimension, like the above-described photographs **62**. For example it would be convenient for the parent, grandparent, or guardian of a child to have each school year photograph of their student held in the same image holder so that an entire photographic record of a child's primary school education could be contained in a single modular frame image holder.

1. A modular picture frame including at least,

a rectangular frame body of a predetermined overall rectangular shape, the frame body includes a surround with a substantial depth dimension which defines an inner edge and an outer perimeter of the general rectangular shape,

an image holder removably mountable within the inner edge of the frame body, the image holder has a generally planar, transparent front through which an underlying image can be viewed, and at least one upstanding wall integrally formed with the transparent front and extending away from the plane of the transparent front, the upstanding wall has at least one detent on a distal edge that is sized to releasably engage the inner edge of the frame body, the upstanding wall is sized to define, together with the transparent front, a cavity with a depth dimension adequate to contain and store at least several thicknesses of paper-based images when the surround is engaged by the wall detent.

2. The modular picture frame of claim **1** wherein the image holder has a translucent perimeter portion around the edges of the transparent front that is dimensioned such that at least the wall detent is partially obscured when viewed through the translucent perimeter portion.

3. The modular picture frame of claim **1** wherein the translucent perimeter has a surface texture which at least partially obscures the edge portions of an image when viewed through the transparent front.

4. The modular picture frame of claim **3** wherein when the image is a photograph with reorder information printed on an edge portion of the photograph, this reorder information underlies the translucent perimeter.

5. The modular picture frame of claim **2** wherein the translucent perimeter has corner edges that connect the generally flat front with the edge portions, with these corner edges are rounded to an outer radius of around one-quarter inch.

6. The modular picture frame of claim **1** further including at least one connector sized and shaped to releasably attach one frame body to a similarly constructed frame body when the two frame bodies are mounted near one another on a wall or the like.

7. The modular picture frame of claim **5** wherein the frame body includes at least one cavity extending into the surround from the backside thereof.

8. The modular picture frame of claim **6** wherein the frame body includes a cavity sized to store at least one connector.

9. The modular picture frame of claim **1** wherein the image holder is releasably attached to the frame body by the at least one detent so that when the frame body is attached to a wall or the like, the frame body need not be removed from its attached condition on a wall when removing or placing an image within the image holder, whereby the modular frame body is constructed to be front loading.

10. The modular picture frame of claim **9** further including a hook and loop fastener adhesively adhered to the back of the frame body such that the modular frame system can be attached to a wall surface but removable therefrom, whereby while the frame body is attached to the wall by the hook and loop fastener, the image holder can be removed from the front of the frame body to permit changing the image to be displayed through the transparent front of the image holder without having to detach the frame body from the wall.

11. The modular picture frame of claim **1** wherein the depth dimension of the cavity is adequate to store up to twenty conventional photographs.

12. The modular picture frame of claim **1** wherein the frame body has a front side float coated with a decorative opaque coating.

13. The modular picture frame of claim **1** wherein the frame body has preferably two props sized and shaped to support the frame body generally upright on a horizontal surface such as a desk.

14. The modular picture frame of claim **13** wherein the props are integrally molded to an inner portion of the frame body, the frame body has at least one cavity in a back surface of the frame body sized to grippingly receive an end of each prop.

15. The modular picture frame of claim **14** wherein the prop includes a horizontal surface engaging edge and a connector edge. and wherein connector edge has an L-shape in cross section whereby when the prop is inserted in the frame body cavity, the prop is held perpendicular to the overall plane of the frame body and positioned generally coplanar with the adjacent outer perimeter of the surround.

16. The modular picture frame of claim **15** wherein prop is shaped such that when assembled to the frame body, the prop supports the frame body at approximately 64 degrees from the horizontal surface on which the supported frame is placed.

17. The modular picture frame of claim **6** having several of the connectors, each of these several connectors has two ends, each of the ends sized to fit snugly into at least one cavity on the back side of the frame body, and a middle portion positioned between the two ends, the middle portion is sized to precisely space a frame body from a similarly constructed

frame body when the two frame bodies are connected to the ends of a connector, such that when one picture frame assembly is mounted on a wall with connectors in place, the similarly constructed frame when connected to the connectors may be positioned precisely relative to the first frame.

18. The modular picture frame of claim **17** wherein if the first frame body is level when attached to a wall surface, a thus connected frame body will be also level.

19. The modular picture frame of claim **6** wherein the frame body has four perimeter sides defining an overall rectangular frame shape, each of the four perimeter sides has appropriately sized cavities in its back sized to receive the ends of the connectors, whereby a plurality interconnected arrangements of frame bodies can be created.

20. The modular picture frame of claim **1** wherein The frame body has an interior flange extending from the inward facing edge at the back face of the surround, the interior flange has a broad front surface and a similarly broad rear surface, the front surface includes information in the form of an embossed or de-bossed text or graphics, whereby such information is readable through any conventional opaque float coating on the front surface of the frame body.

21. The modular picture frame of claim **20** wherein the interior flange has markings for locating the adhesive hook and loop fasteners, and has apertures therethrough for use with conventional penetrating wall fasteners.

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