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# United States Patent [19]

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Albin et al.

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[54] **SUPPORT SYSTEM FOR PICTURE FRAMES**

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[21] Appl. No.: **794,482**

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[22] Filed: **Feb. 4, 1997**

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**Related U.S. Application Data**

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[63] Continuation of Ser. No. 475,487, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 225,901, Apr. 11, 1994, abandoned.

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- [51] **Int. Cl.<sup>6</sup>** ..... **A47G 1/06**
- [52] **U.S. Cl.** ..... **40/762; 40/761; 40/757**
- [58] **Field of Search** ..... 40/700, 745, 746,  
40/761, 762, 757; 248/455, 456, 450, 297.21;  
160/118, 196.1, 199, 200; 411/84, 85

[57] **ABSTRACT**

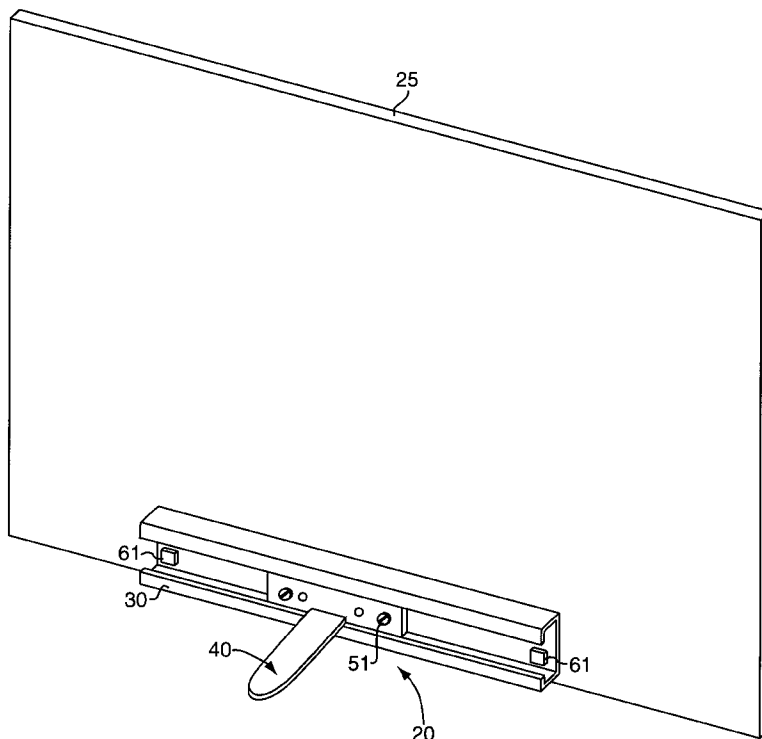
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A picture frame support system is disclosed. In one aspect of the invention, a variety of free standing support arrangements are provided that cooperate with a support rail on the picture frame. The support rail defines a channel with a constricted opening. The support arrangement includes a coupling mechanism sized appropriately to fit within the frame support rail channel. An elongated support arm extends transversely from the coupling mechanism to support the frame. In one embodiment, a cam based coupling mechanism is described. In another, a slider based coupling mechanism that utilizes a pair of threaded studs to engage the support rail channel. In another aspect of the invention, an independent frame support rail channel is disclosed that may be adhered to a mount board or the like to facilitate hanging and/or supports such as the free standing supports described above.

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**3 Claims, 9 Drawing Sheets**



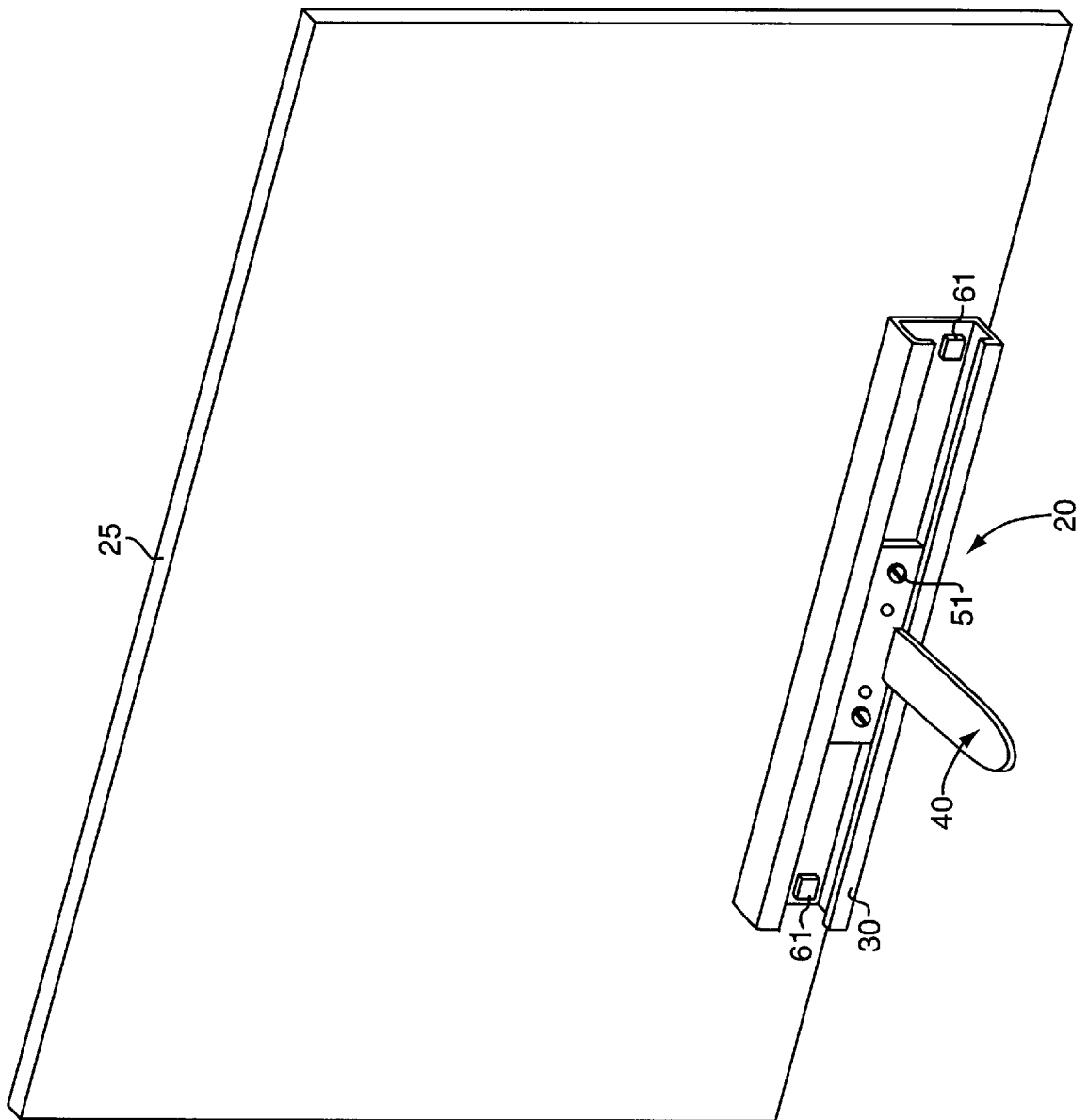
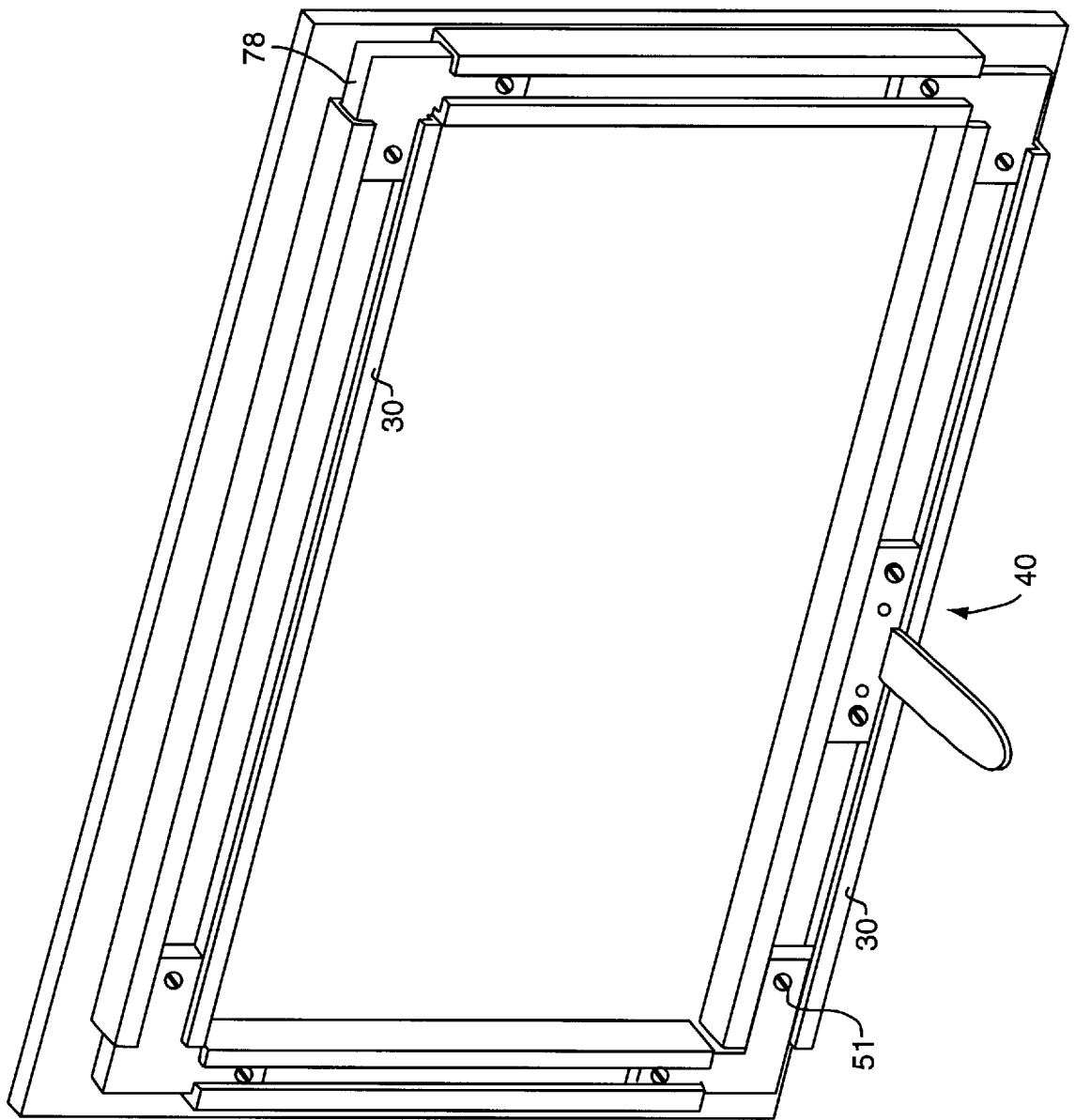


Fig. 1

Fig. 2



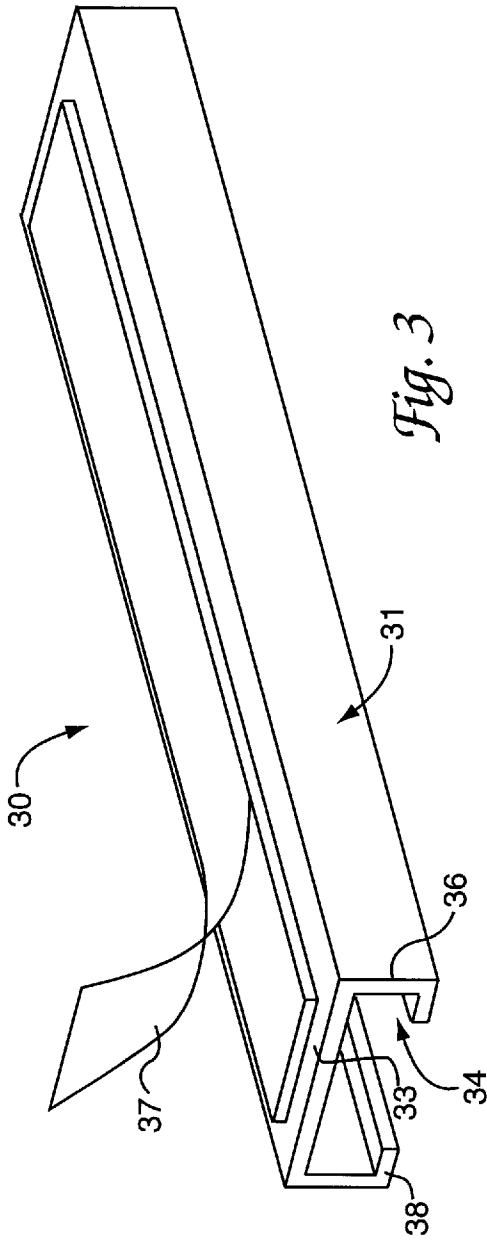


Fig. 3

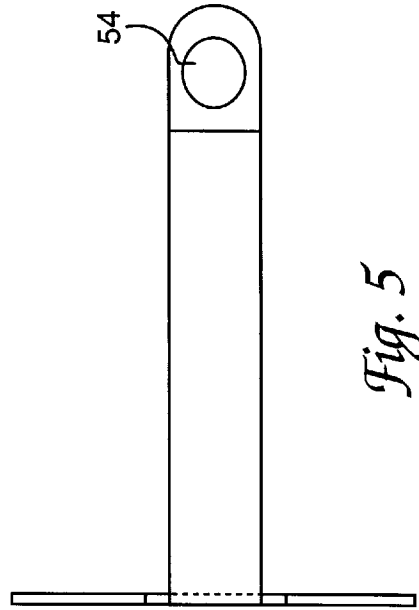


Fig. 5

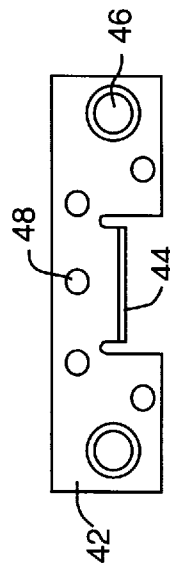
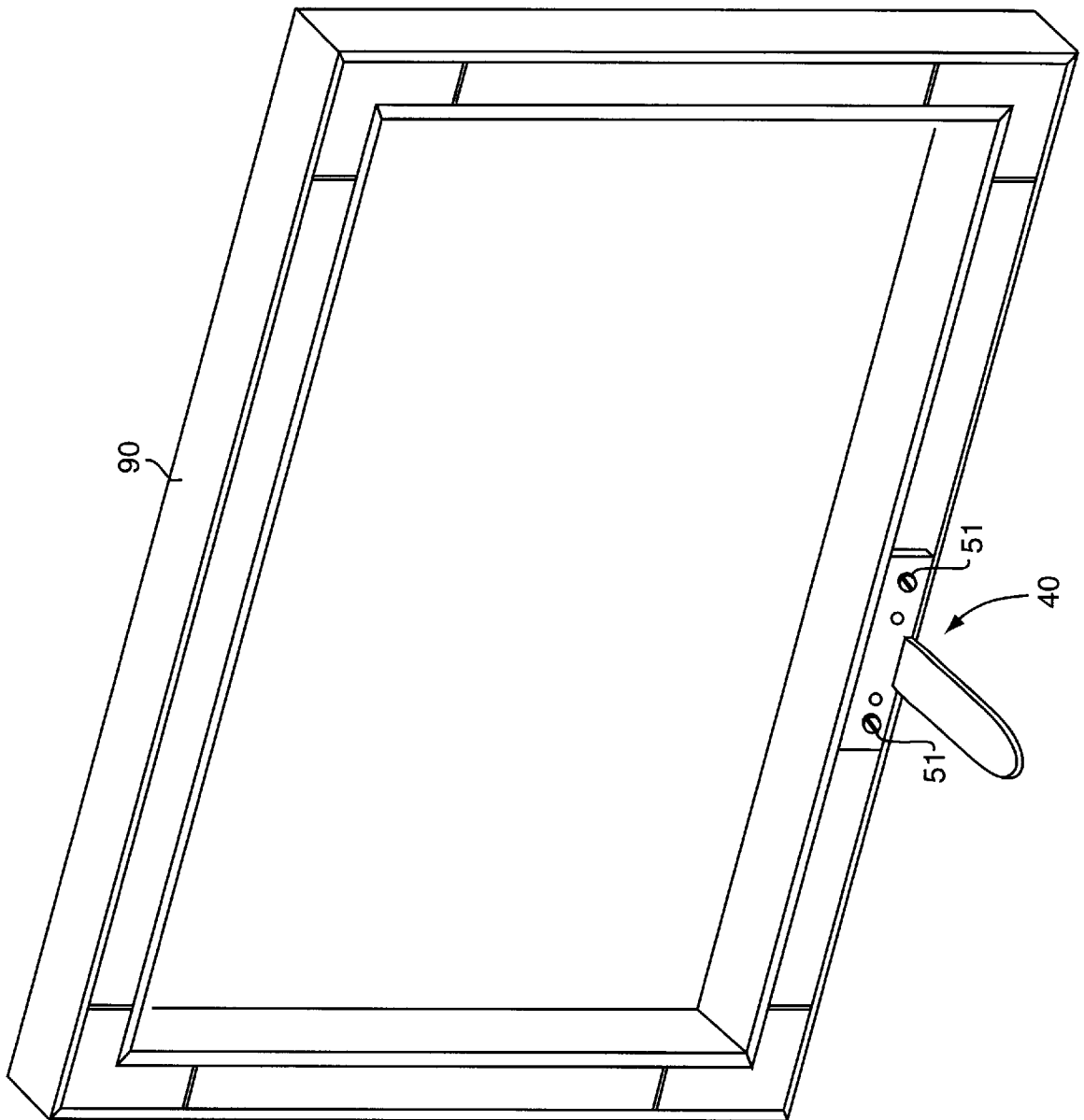
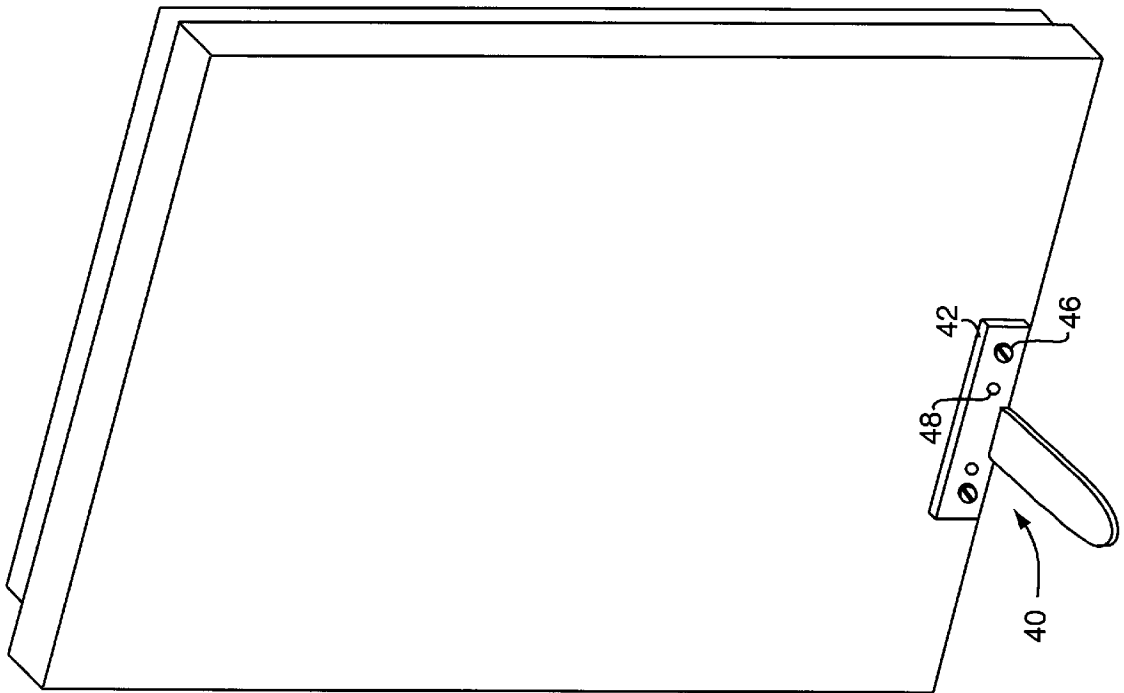


Fig. 4

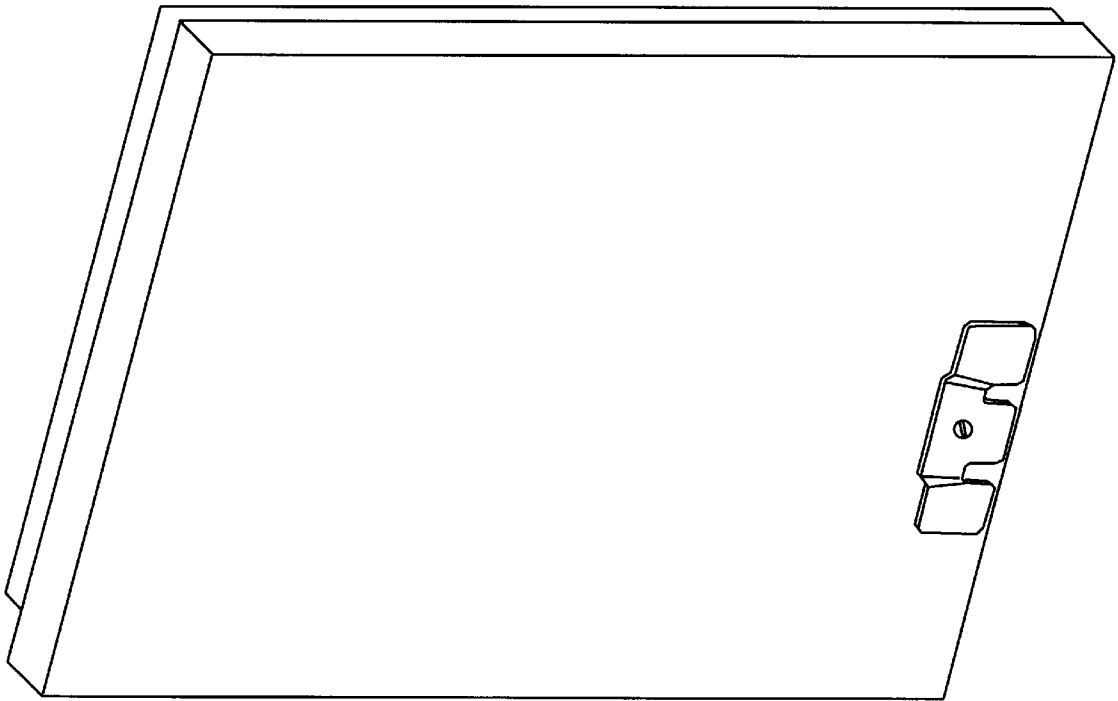
Fig. 6

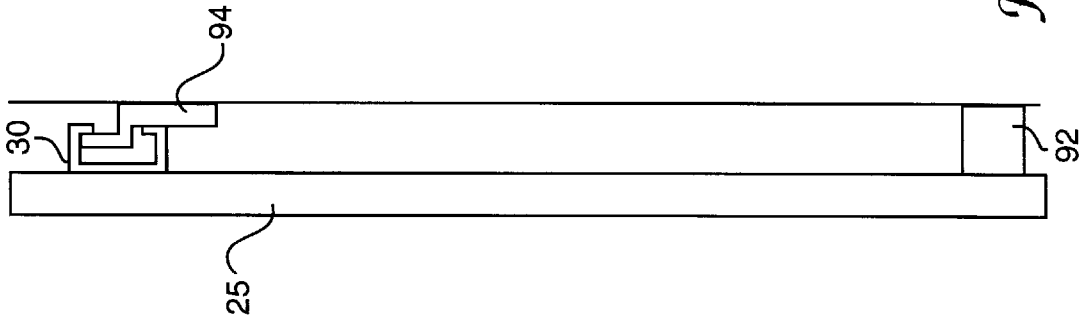




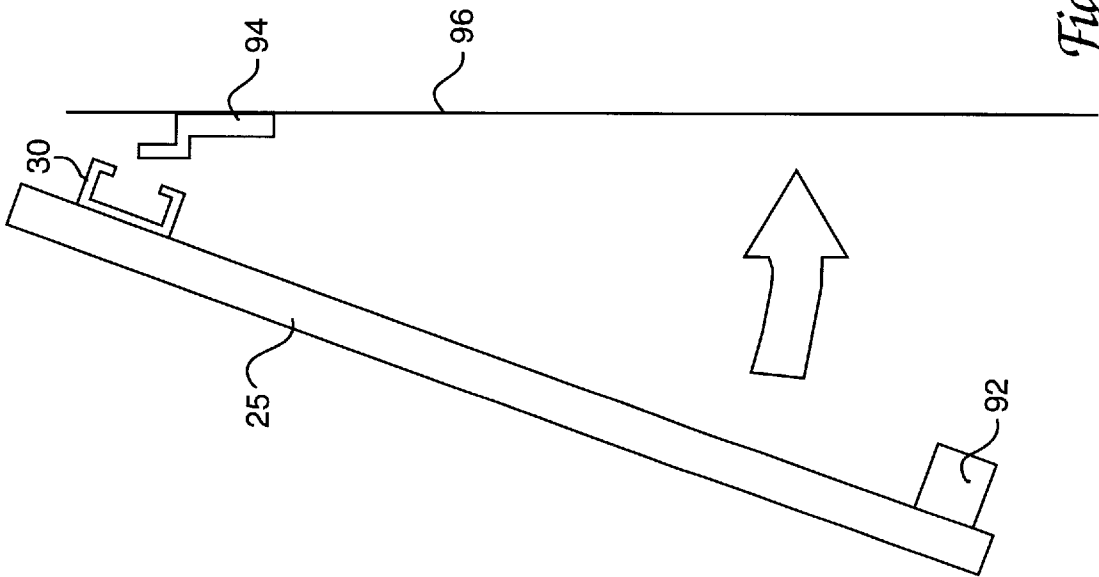
*Fig. 7a*

*Fig. 7b*





*Fig. 8b*



*Fig. 8a*



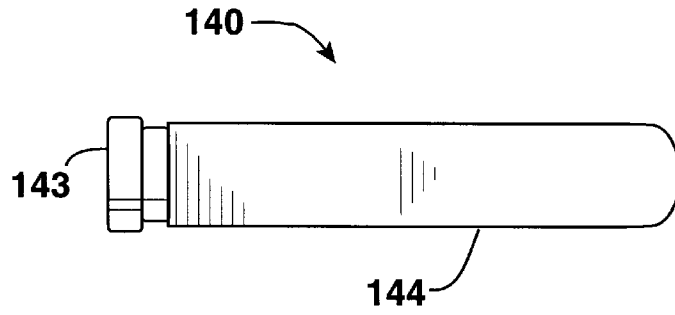


Fig. 9(a)

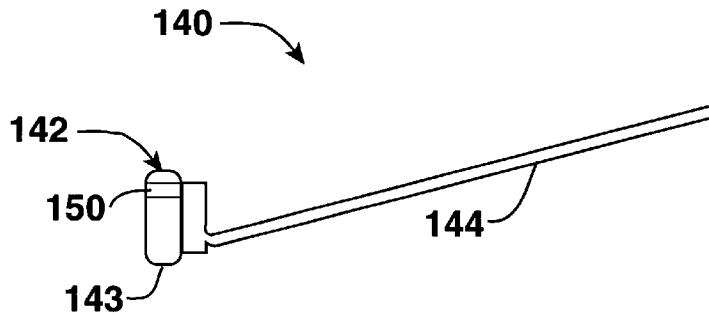


Fig. 9(b)

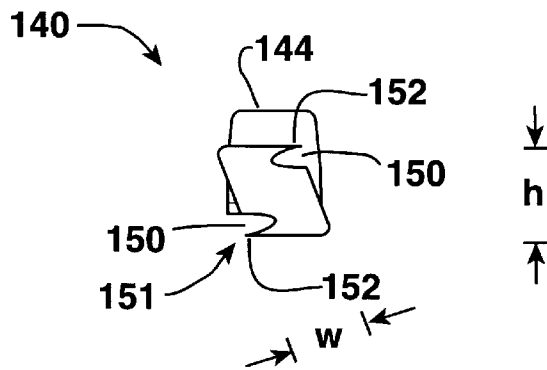
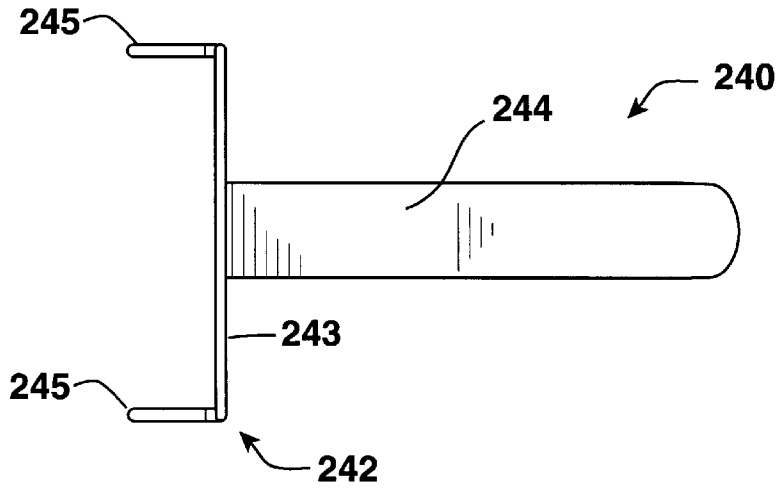
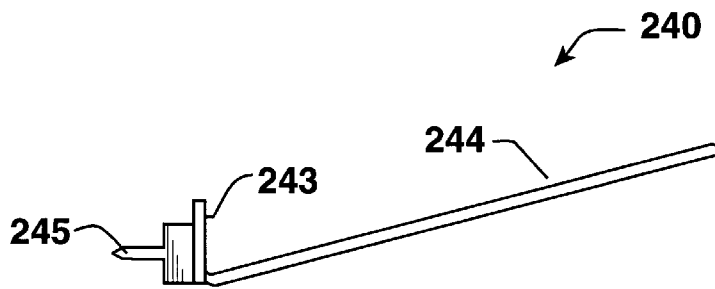


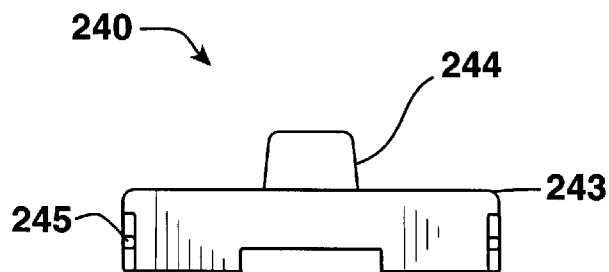
Fig. 9(c)



*Fig. 10(a)*



*Fig. 10(b)*



*Fig. 10(c)*

## SUPPORT SYSTEM FOR PICTURE FRAMES

This application is a continuation of application Ser. No. 08/475,487 filed Jun. 7, 1995, which is in turn a continuation-in-part of application Ser. No. 08/225,901 filed Apr. 11, 1994, which is incorporated herein by reference in its entirety.

### BACKGROUND OF THE INVENTION

The present invention relates generally to support systems for picture frames, picture mount boards and the like. In one aspect of the invention, various free standing support members are described. In another aspect of the invention, a support rail channel suitable for attachment to a flat backed surface is described. These devices may be used either standing alone or in cooperation with one another in order to support a picture frame, mount board or the like.

There are a wide variety of devices that are conventionally used to frame pictures, photographs, drawings, diplomas and a variety of other objects. Picture frames take a wide variety of forms including metal frames, wooden frames, plastic frames, mount boards, picture mats, plaques, etc.. In the description herein, the terms picture frame and mount board are intended to generically cover all of these devices. Such picture frames come in a wide variety of shapes, colors and materials. Often it is desirable to hang the picture frame on a wall. It is also often desirable to set the picture frame as a free standing device. A wide variety of support mechanisms are well known to the art. By way of example, in free standing picture frames, collapsible cardboard cutouts are frequently used. Another support system is disclosed in U.S. Pat. No. 5,095,641. In many types of frames, a wire is attached to the back so that the wire can be engaged with a wall mounted hook in order to support the picture frame.

Still another support system is provided in some metal frames in particular. Specifically, a channel type arrangement is provided around the perimeter of the back and/or front side of the picture frame. Wall mounted supports are sometimes used in conjunction with such channels to support the frame. The channels have internal edges so that they will engage a lip on the wall support. Although there are currently a variety of picture frame support mechanisms available on the market, there is an ongoing need for improved support arrangements. Accordingly, it is an object of the present invention to provide improved picture support systems.

### SUMMARY OF THE INVENTION

To achieve the foregoing and other objects and in accordance with the purpose of the present invention, a picture frame support system is disclosed. In one aspect of the invention, a free standing support arrangement is provided that cooperates with a support rail on the picture frame. The support rail defines a channel with a constricted opening. The support arrangement includes a coupling member sized appropriately to be received within and releasably engaged with the rail channel. An elongated support arm extends transversely from the coupling member. The coupling member cooperates with an inner surface of the channel to releasably secure the support arrangement to the frame support rail. When secured, the support arm extends outwardly away from the rail channel to support the frame in a free standing manner.

In one preferred embodiment, the coupling member takes the form of a cam member. In another, the coupling member

includes a slider having threaded holes extending there through, and threaded studs arranged to threadably engage the threaded holes. In one described arrangement of the cam member, the cam member substantially has the shape of a parallelogram and includes notches formed adjacent diagonally opposed corners of the parallelogram to form fingers that assist in latching the cam mechanism.

In another aspect of the invention, an independent frame support rail is disclosed that may be adhered to a mount board or the like to facilitate hanging and/or supports such as the free standing support described above. The support rail includes a channel member having an elongated web and a pair of arms extending substantially perpendicularly from one side of the web. The web and arms cooperating to define a trough. Each arm has an inward facing lip. The lips cooperate to form an opening to the channel trough which is narrower in width than the width of the trough. A double-sided adhesive tape is adhered to the back side of the web for attaching the rail to the mount board.

### BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a diagrammatic back perspective view of a mount board incorporating a free standing support arrangement and a rail support channel in accordance with one aspect of the present invention.

FIG. 2 is a diagrammatic back perspective view of a mount board incorporating a free standing support arrangement and a perimeter rail system in accordance with the present invention.

FIG. 3 is a diagrammatic back perspective view of the adhesive backed rail support channel shown in FIG. 1.

FIG. 4 is a diagrammatic front view of a slider support member in accordance with one embodiment of the present invention.

FIG. 5 is a diagrammatic bottom view of the support member shown in FIG. 4.

FIG. 6 is a diagrammatic back perspective view of a conventional channel backed picture frame that utilizes a free standing support arrangement in accordance with one aspect of the present invention.

FIG. 7a is a diagrammatic back perspective view of a conventional flat backed plaque that utilizes a free standing support arrangement in accordance with another aspect of the present invention.

FIG. 7b is a diagrammatic back perspective view of a conventional flat backed plaque that utilizes an E-shaped three prong hook to support a free standing support arrangement in accordance with another aspect of the present invention.

FIGS. 8a and 8b are diagrammatic end views of a picture mat incorporating a rail support channel illustrating its use in conjunction with a wall hanger to support a mount board.

FIGS. 9a-9c are diagrammatic top, side and end views of a locking cam support member in accordance with another embodiment of the present invention.

FIGS. 10a-10c are diagrammatic top, side and end views of a spike support member in accordance with another embodiment of the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

Referring initially to FIG. 1, a preferred embodiment of the present invention will be described. As seen therein, a

frame support system **20** is attached to a mount board **25**. The frame support system **20** includes two major components. The first is a support rail **30** and the second is a free standing arm support **40**. In the embodiment shown, the arm support **40** takes the form of a slider based arm support. The support rail channel **30** is highlighted in FIG. **3** while the slider arm support **40** is highlighted in FIGS. **4** and **5**.

Referring next to FIG. **3**, the support rail **30** will be described in more detail. The support rail includes a channel member **31** having a elongated web **33**, and a pair of arms **36** which cooperate with a web to form a substantially U-shaped channel. Each of the arms **36** has an inturned lip **38** at its distal ends. The lips are arranged to face one another such that they form a constricted opening to the trough **34** formed by the U-shaped channel. The distal ends of the lips **38** are tapered on their outer surface so as to provide a funneling type entrance to the channel trough. A double-sided adhesive tape **39** is adhered to the back surface of the web **33**. The adhesive tape includes a non-stick paper cover **37** which may be removed to expose the adhesive back surface of the double-sided tape. When the non-stick cover paper is removed, the support rail may be adhered to a mount board of any type, as seen for example in FIGS. **1**, **2** and **8**. The support rail can then be used as part of a support system to support the mount board.

A pair of stop pads or stoppers **61** may be provided or integrally formed on the inner surface of web **33** as best seen in FIG. **1** in order to prevent support structures such as slider arm support **40** from sliding out the end of the channel during use. The support rail **30** may be formed from a wide variety of materials. By way of example, an easily extruded metal such as aluminum works well. To improve the channel's appearance and prevent problems with corrosion, it may be desirable to coat the extruded material with a protective coating such as anodizing the aluminum. Of course, the protective coating is not required and indeed the support rail **30** may be formed from a wide variety of different materials, whether they be metallic, plastic, ceramic, etc.

The actual size of the support rails may vary widely in accordance with the needs of a particular frame. However, a web width of approximately  $\frac{3}{8}$ -inch, an arm length of approximately  $\frac{5}{16}$ -inch and a lip length of approximately  $\frac{1}{8}$ -inch has been found to work well. A typical wall thickness may be on the order of approximately  $\frac{1}{20}$ -inch. A suitable lip taper angle is approximately  $45^\circ$  where the lip extending in the neighborhood of 50% of the way down the thickness of the lip. Of course, the actual dimensions can be widely varied. However, the described sizes worked well with standard hangers.

Referring next to FIGS. **4** and **5**, a slider arm support **40** in accordance with one embodiment of the invention will be described in more detail. The slider arm **40** includes a slider member **42** and the support arm **44** which extends transversely from the slider member.

The slider **42** has a pair of threaded holes **46** positioned near opposite ends of the slider. The support arm **44** extends from a central portion of the slider. A plurality of smaller openings **48** are also provided at appropriate positions about the slider member **42**. The openings **48** may receive fasteners such as small diameter nails, tacks and/or staples in order to fasten the slider to a wood frame as will be discussed below with reference to FIG. **7a**. The threaded holes **46** are arranged to receive threaded studs **51** which are used to secure the slider to a channel type support rail. The arms **44** extend transversely from the slider **42**. A cushion pad **54**

may be provided on the bottom surface of the support arm to prevent the support arm from scratching furniture or other objects that the picture frame is set on. The cushion pad may be formed from a wide variety of materials. By way of example, a small circular felt pad has been found to work well.

The appropriate dimensions for the slider arm support **40** will vary widely in accordance with the type and size of picture frame that is intended to be used. By way of example, a suitable length for the slider member **42** is approximately two inches, a suitable width is on the order of just under a half inch. The length of the arm support **44** may also be varied a great deal. By way of example, a length of approximately three inches has been found to work well. More generally arm supports in the range of one to six inches have been found to work well for most conventionally sized mount boards.

The arm support **44** extends transversely relative to the slider member **42**. The slider **42** and the support arm **44** are preferably integrally formed. By way of example, the slider arm support **40** may be formed from a suitable metallic material such as steel. Like the support rail **30**, the slider arm **40** may be coated with a protective coating to reduce its abrasive properties and improve its appearance. One advantageous property of metallic materials is that when sized appropriately, they may be bent somewhat and still retain their strength. This is an advantage so that the user can adjust the angle at which the picture frame will rest when it is sitting in a free standing position.

When used in cooperation with a support rail **30** as seen in FIG. **1**, the slider portion **42** of the slider arm support **40** can be inserted into the rail's channel trough **34**. Then a pair of threaded studs **51** are screwed into threaded holes **46** until they contact the inner surface of web **33**. The studs are further turned until a front surface of the slider is pressed into engagement with the channel lips **38**. With both studs **51** tightened firmly, the slider arm support **40** will be firmly secured to rail **30** which in turn provides a solid support for picture frame **25**.

Referring next to FIG. **2**, an alternative embodiment of the invention will be briefly described. In this embodiment, four support rails **30** are attached to the back surface of a picture mat **25** in a manner that substantially forms a rectangle. Conventional corner pieces **78** may be used to connect the sides of the rectangles. The corner pieces **78** are merely connecting pieces that are suitable for sliding into the troughs **34** of the rail channel **31**. Threaded studs **51** which engage threaded holes in the corner pieces may be used to firmly secure the corner pieces to the rail channels in the same manner that the slider is attached to the rail channels. A rectangular rail system as seen in FIG. **2** is very convenient from the standpoint that it permits the mount board **25** to be used in any orientation. Specifically, the slider arm support **40** can be placed in any of the side channels in the channel system in order to permit the mount board to be free standing in any orientation. Alternatively, any of the side channels standing alone may be used to hang the mount board.

Referring next to FIG. **6**, it should be appreciated that the described slider arm support **40** can also be used with conventional metal picture frames such as the picture frame **90** shown in FIG. **6**. As is well known to those skilled in the art, metal frames that include an integrally formed rail arrangement are well known to the prior art. One standard size is the  $\frac{3}{8}$ -inch wide rail with a  $\frac{3}{8}$ -inch wide opening to the rail's channel. Accordingly, the described slider arm

support **40** can be mounted to such standard metal frames in the manner described above with reference to FIG. **1** and as shown in FIG. **6**.

Referring next to FIG. **7a**, it should be apparent that the described slider arm support **40** can also be used in conjunction with standard wood frames. Specifically, the slider **42** can be nailed, stapled or pinned to the back of a wooden frame by using suitable fasteners. The fasteners can be inserted either through the threaded holes **46** or the smaller openings **48** best shown in FIG. **4**, and as described above.

In an alternative embodiment, the slider portion **42** of the slider arm support **40** can be used to engage a hook mounted on the back side of a frame. By way of example, the slider may engage an E-shaped three prong hook having a center prong attached to the frame and a pair of raised side prongs as shown in FIG. **7b**. In this embodiment, no screws, studs or nails are required to couple the slider arm support **40** to the frame. By mounting the three prong hook such that it faces downward, the slider portion **42** may be positioned in the hook with the support arm **44** positioned to extend outward between the raised side prongs. The slider portion **42** is slid between the attached center prong and the raised outer prongs to couple the slider arm support to the hook, thereby supporting the frame.

Referring next to FIGS. **8a** and **8b**, it should be appreciated that the described rail channels can also be used independently to permit a mount board to which it is attached to be wall mounted. Specifically, as seen in FIG. **8a**, a mount board **25** having a support rail **30** on one end and a bumper **92** on another end may be attached to a conventional picture frame wall hanger **94** that is tacked into a wall **96**. When properly installed, the picture frame **25** will hang as diagrammatically illustrated in FIG. **8b**. Alternatively, a wide variety of conventional hangers such as snap in saw tooth hangers can be used in conjunction with the rail channels.

Referring next to FIGS. **9a-9c**, an alternative support arm arrangement **140** is illustrated. In this embodiment, the slider member based coupling mechanism (as illustrated in FIGS. **4** & **5**) is replaced by a cam based coupling mechanism **142**. The support arm arrangement **140** includes a support arm **144** which extends transversely from a cam member **143**. The cam member **143** is arranged to secure the support arm arrangement to a channel type support rail. Accordingly, the cam member **143** has a width (*w*) that is slightly narrower than the opening between the rail's lips. At the same time, its height (*h*) is about the width of the full rail trough and, importantly, wider than the opening between the rail's lips. That is, it is about the same height as the distance between the channel arms.

In the embodiment shown, the cam member **143** has a substantially parallelogram type shape, with notches **150** cut adjacent the diagonal corners **151** that are closest together so as to form projections **152** that extend along opposite sides of the cam member. The projections **152** serve to lock the cam member in place during use. When used in cooperation with a support rail **30** as seen in FIG. **1**, the coupling mechanism of the support arm arrangement **140** can be inserted into the rail's channel trough **34**. Then the entire member is then twisted such that the short diagonal corners first come into contact with associated channel arm and further such that the opposing sides **156** and **157** of the cam member come into contact with the channel arms, thereby holding the support arm arrangement **140** in place. Thus, the cam member **143** acts as a locking cam.

The actual dimensions of the support arm arrangement **140** may be varied in accordance with the needs of any

particular system. However, cams adapted to engage channels having the dimensions set forth above and having support arm lengths **144** on the order of one to six inches as discussed above have been found to work well. The support arm arrangement may be formed from any suitable materials. In a preferred embodiment, the slider **42** and the support arm **44** are integrally formed, although this is not a requirement. By way of example, plastic has been found to work well. When desired, and especially when metal or other hard materials are used as the support arm, a cushion pad **54** may be provided on the bottom surface of the support arm to prevent the support arm from scratching furniture or other objects that the picture frame is set on as discussed above. Similarly, when metal or other hard materials are used, the support arm may be coated with a protective coating to reduce its abrasive properties and improve its appearance.

Referring next to FIGS. **10a-10c** another alternative support arm arrangement **240** is illustrated. In this embodiment, the slider member based coupling mechanism (as illustrated in FIGS. **4** & **5**) is replaced by a spike based coupling mechanism **242**. The support arm arrangement **240** includes a support arm **244** which extends transversely from a base **243**. The base **243** has a pair of spikes **245** that may be driven into a wooden frame or the like to couple the support arm arrangement **240** to the frame. The actual geometry, size and spacing of the base **243**, the support arm **244** and the spikes **245** may be widely varied. The support arm arrangement may be formed from any suitable materials. By way of example, metal has been found to work well. When desired, a cushion pad **54** may be provided on the bottom surface of the support arm to prevent the support arm from scratching furniture or other objects that the picture frame is set on as discussed above. Similarly, when metal or other hard materials are used, the support arm may be coated with a protective coating to reduce its abrasive properties and improve its appearance.

Although only a few embodiments of the present invention have been described in detail, it should be understood that the present invention may be embodied in many other specific forms without departing from the spirit or scope of the invention. Particularly, the materials from which the support rail and/or the slider arm support are formed may be widely varied. Of course, the sizes of the components can also be varied in accordance with the needs of a particular system. As has been explained with reference to some of the drawings, the support rail and the slider arm support may be used either independently or in combination to facilitate supporting a suitable picture frame.

In the specification, two support arm arrangement coupling mechanisms have been described in detail. That is the cam based system and the slider based system. Of course, a variety of alternative coupling mechanisms could be used in their place. In cam based systems, the geometry of the cam may be varied a great deal without departing from the spirit or scope of the invention. By way of example, when desired, the notches **150** may be eliminated and replaced by rounded corners.

Frequent reference has been made to the support of picture frames and mount boards. It should be appreciated that within the context of this description, the terms picture frame and mount board are intended to be a generic term that includes picture frames of any type including wooden, metallic, plastic, glass, cardboard and other picture frames, as well as mount boards, mats and plaques. The drawings show the use of the slider arm support and the support rail in a variety of configurations, however, it should be appreciated that framers may use the components in a wide variety

of different orientations and configurations as well. Therefore, the present examples are to be considered as illustrative and not restrictive, and the invention is not to be limited to the details given herein, but may be modified within the scope of the appended claims.

We claim:

1. A reusable picture frame support means suitable for supporting a plurality of different types of picture frames in a free standing manner, wherein a first type of supportable picture frame has a front display plane, a rear surface and a frame support rail attached to said rear surface that defines a channel with a constricted opening that faces away from the display plane, the picture frame support means comprising:

a slider sized appropriately to be received within and releasably engaged with a channel of a frame support rail of a first type of picture frame, wherein the slider is further sized such that the slider is insertable through the constricted opening of the channel of the first type of picture frame, the slider including a plurality of threaded holes and a plurality of additional openings;

an elongated support arm extending transversely from the slider, wherein the slider is suitable for cooperating with an inner surface of the channel of the first type of picture frame to secure the picture frame support means to the frame support rail of the first type of picture frame, whereby when said slider secures the picture frame support means to the frame support rail, the support arm extends transversely away from the display plane of the picture frame supported by said picture frame support means in a manner suitable to support the first type of picture frame in a free standing manner; and

a means suitable for securing said slider to a second type of picture frame to be supported by said picture frame support means, the securing means including members configured to pass through the plurality of the additional openings which are arranged to receive such securing means, and engage with the rear surface of the second type of picture frame to firmly hold the picture frame support means in place, with the support arm extending transversely away from the display plane, to facilitate supporting the second type of picture frame in a free standing manner without a support rail.

2. A reusable picture frame support means suitable for supporting a picture frame in a free standing manner, wherein the picture frame has a display plane and a support rail that defines a channel with a constricted opening that faces away from the display plane, the picture frame support means comprising:

a coupling member sized appropriately to be received within and releasably engaged with a channel of a frame support rail of a picture frame having a display plane, wherein the coupling member is further sized such that the coupling member is insertable through a constricted opening of the channel; and

an elongated support arm integrally formed with the coupling member and extending transversely from the

coupling member wherein the coupling member is suitable for cooperating with an inner surface of the channel to secure the picture frame support means to the frame support rail, whereby when said coupling member is arranged to secure the picture frame support means to the frame support rail, the support arm extends transversely away from the display plane of the picture frame supported by said picture frame support means to support the picture frame in a free standing manner, whereby the coupling member is suitable for being inserted directly through the constricted opening portion of the frame support rail to facilitate attaching the picture frame support means to the picture frame: and

wherein the coupling member is further configured to engage an E-shaped three prong hook attached to the picture frame supported by the support means on opposing sides of said elongated support arm in an alternative mounting arrangement, whereby the support arm extends away from the display plane to support the frame in a free standing manner.

3. A reusable picture frame support means suitable for supporting a picture frame in a free standing manner, wherein the picture frame has a display plane and a support rail that defines a channel with a constricted opening that faces away from the display plane, the picture frame support means comprising:

a coupling member sized appropriately to be received within and releasably engaged with a channel of a frame support rail of a picture frame having a display plane, wherein the coupling member is further sized such that the coupling member is insertable through a constricted opening of the channel; and

an elongated support arm integrally formed with the coupling member and extending transversely from the coupling member, wherein the coupling member is suitable for cooperating with an inner surface of the channel to secure the picture frame support means to the frame support rail, whereby when said coupling member is arranged to secure the picture frame support means to the frame support rail, the support arm extends transversely away from the display plane of the picture frame supported by said picture frame support means to support the picture frame in a free standing manner; and

wherein said coupling member further includes openings on either side of said support arm, the openings configured to receive a projection there through, whereby when said coupling member receives the projection, the support arm extends transversely away from the display plane to support the frame in a free standing manner; and

whereby the coupling member is suitable for being inserted directly through the constricted opening portion of the frame support rail to facilitate attaching the picture frame support means to the picture frame.

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