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(54) **System for adjustably mounting an item to a verticle surface**

System zur verstellbaren Befestigung eines Gegenstandes an einer vertikalen Fläche

Système pour la fixation réglable d'un dispositif sur une surface verticale

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a system for adjustably mounting an item to a vertical surface. More particularly, the system comprises a track within which a cooperating slide is adjustably received and locked, with one structure engaging the item and the other structure engaging the vertical surface. Further, if desired, the system will accommodate engagement to a security system to indicate tampering with the mounted item.

PRIOR ART

[0002] It is often desirable to mount an item, such as a picture, to a vertical surface, such as a wall. Such mounting often times does not provide exact positioning desired. For example, the item may not hang straight, it may cock when hung by a wire, it may be a bit too high, a bit too low, or it may need to move toward the right or left.

[0003] when one uses a hanger such as a nail, numerous holes are made in the wall until desired positioning is attained.

[0004] Such disadvantages have been addressed in various ways.

[0005] The Schrager et al US Patent No 2,522,901 and the Schwartz US Patent No 2,723,096 both disclose a vertically adjustable system which incorporates a threaded member for use in adjusting positioning of a hanger engaged thereto while an item remains suspended from the hanger thereof.

[0006] The Robertson et al US Patent No 4,611,780 discloses a picture hanging assembly which includes adjustable structures for assuring level positioning of an item depending therefrom.

[0007] Finally, the Kelrick US Patent No 4,892,284 discloses a hanger which is very complex and which accommodates both vertical and horizontal adjustment.

[0008] As will be described in greater detail hereinafter, none of the prior art systems discloses structure which not only may be used for assuring desired positioning of an item suspended therefrom but also locks the item onto the vertical surface and accommodates engagement to a security system for indicating tampering with the suspended item.

[0009] The GB 2 247 609 A discloses a hanging system for mounting an item to a vertical surface according to the preamble of claim 1. The system comprises a track 8 and a slider 10 slidably engaged to each other and including means 38 for maintaining relative position therebetween, the track 8 having means 30 for further engaging directly to either of said vertical surface and said item and the slider 10 having means 12 for further engaging either of said item and said vertical surface. The track 8 defines a hollow channel 18 in one surface thereof opposite a surface thereof which is engageable to one of said items and said vertical surface.

SUMMARY OF THE INVENTION

[0010] The present invention relates to a hanging system for mounting an item to a vertical surface according to claim 1.

[0011] Preferred features of the invention are set out in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

Figure 1 is a perspective view of the hanging system of the present invention.

Figure 2 is an end view of the track of Figure 1 showing the configuration of a closed end thereof hidden from view in Figure 1.

Figure 3 is an end view of the slider of Figure 1 showing the configuration of a closed end thereof hidden from view in Figure 1.

Figure 4 is an enlarged bottom plan view of the system and shows heads of connectors for engaging the system to an item and a vertical surface in phantom.

Figure 5 is a perspective side view of a vertical surface and an item suspended therefrom by the system of Figure 1.

Figure 6 is a front view of the system, showing same oriented for use in a horizontal position.

Figure 7-8 show a sampling of configurational embodiments for the system.

Figure 10 shows an item having a single track attached thereto.

Figure 11 shows an item having 2 tracks attached thereto.

Figure 12 shows an item having a slider attached thereto

Figure 13 shows attachment of the item of Figure 12 to a track mounted to a vertical surface.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Referring now to the drawings in greater detail, there is illustrated therein a system for adjustably mounting an item to a vertical surface made in accordance with the teachings of the present invention and generally identified by the reference numeral 10.

[0014] As shown, the system 10 includes a base or track 12 within which a slider 14 is received. The track 12 has an open end 16 through which the slider 14 enters the track 12, with an opposite end 18 of the track 12 being closed off by a wall 20 (Figure 2).

[0015] Within this wall 20 is a threaded opening 22 which receives a threaded positioning connector or bolt

24, with a head 26 of the connector 24 resting outwardly of the track 12. An opposite end 28 of the threaded connector 24 is rotatably engaged within a non threaded slot 30 provided in an end wall 32 (Figure 3) of the slider 14.

[0016] The slider 14 further has a plurality of vertically ovaled throughbores 34 therein, vertically spaced along a length thereof which are provided for use in engaging the slider 14 to a vertical support surface 36 or item 38 to be hung therefrom. The throughbores 34 are ovaled so that a small degree of vertical adjustment for positioning is possible.

[0017] It will be understood that the track 12 and slider 14 are configured to slidingly cooperate with each other, with their configuration further being such that the track 12 cannot be disconnected from slider 14 except by sliding the slider 14 out through the open end 16 of the track 12.

[0018] It will further be understood that placement of the throughbores 34 in the slider 14 must be located therealong in such a manner that a head 40 (Figure 4) of a connector or bolt 46 extending inwardly thereof will be accessible for manipulation but will not interfere with cooperating slidability between the track 12 and slider 14 when they are engaged to one another.

[0019] To meet this requirement, the track 12 includes a center channel 42 in one surface 44 thereof through which bolt heads 40 may be reached and along which bolts 46 used for mounting the slider 14 may be accommodated while the slider 14 and track 12 are cooperatively engaged.

[0020] It will also be seen that another surface 48 of the track 12, which is opposite the surface 44 having the channel 42 therein, is provided with a plurality of horizontally ovaled throughbores 50 therein which lie along a line centered along the length of the surface 48. The througbores 50 here allow for a small degree of horizontal adjustment in positioning. The throughbores 50 in the track 12 are provided for use in engaging the track 12 to a selected surface such as a rear surface 52 of the item 38, such as a picture frame 38, or a selected vertical surface 36 such as a wall 36.

[0021] To accommodate for track connector head 56 (Figure 4) placement within the track 12 it is necessary to assure cooperative slidability therepast as well and this is accomplished by providing at least a channel 60 in an underside 62 of the slider 14 which will avoid contact with the connector head 56 within the track 12, maximally providing an essentially three sided, hollow slider 14 as best illustrated in Figure 4, which is a bottom view showing the slider 14 and track 12 joined together with connector head 40 and 56 placement being illustrated therein.

[0022] It will be understood further that it is desirable to be able to simply lock the track 12 and slider 14 together so that the item 38 suspended by the system 10 cannot be easily removed therefrom.

[0023] For this purpose, the track 12 is created to be significantly longer than the slider 14, and a throughbore 66 is provided in each sidewall 68 of the track 12. A further threaded connector 70, having a length greater than the width of the track 12 is engaged across the open end 16 of the track 12, by threading same through the pair of throughbores 66, effectively locking the slider 14 within the track 12.

[0024] Engagement and locking of the slider 14 and track 12 together are performed only after the individual elements 12 and 14 are appropriately engaged to their respective structures 36, 38 producing a locked in place vertical mounting of the item 38, as best illustrated in Figure 5.

[0025] Here, the slider 14 is fixed to the vertical support surface or wall 36 by at least one connector 46 and the track 12 is seen engaged to the item 38 or picture frame 38 by at least one connector 54 shown in phantom.

[0026] Open end 16 of the track 12 is downwardly disposed and elevation of the opposite end 18 of the track 12 above the top surface 32 of the slider 14 is determined by threaded positioning of the bolt 24 extending through the opening 22 of the track 12 into and against an opposing bottom surface 72 of the slot 30 provided in the surface 32 of the slider 14.

[0027] Once desired relative positioning is achieved by manipulation of the bolt 24, engagement is locked by insertion of the locking bolt 70 as described above.

[0028] Figure 6 discloses a horizontal orientation for the system 10 which is desirable for use when adjustability of horizontal rather than vertical orientation is of greater importance.

[0029] Figures 7 and 8 are provided to illustrate several further embodiments that are possible for the system 10, among others, and that the specific configurations shown and described should not be construed as limiting.

[0030] Figures 10 and 11 show an item 38 engaged to one or more tracks 12 and ready to be mounted to a vertical surface 36 by a cooperating one, or plurality of, sliders 14 having end wall 32 thereof upwardly directed.

[0031] Figures 12 and 13 disclose a vertical orientation for at least one system 10 wherein a slider 14 is engaged to the item 38 to be mounted, necessitating engagement of the track 12 to the supporting surface 36. Here it will be seen that the track 12 is inverted from the position of Figure 5. This places the end 18 of the track 12, through the wall 20 of which the positioning bolt 24 extends, downwardly disposed. For the bolt 24 to act upon the end wall 32 of the slider 14, the slider 14 must be engaged to the item 38 in a manner where the wall 32 is also downwardly disposed. Such opposite orientation to that illustrated for use when the slider 14 is engaged to the vertical surface 36 is necessary so that relative adjustability is provided and places the locking bolt 70 above the slider 14.

[0032] It will be understood that use of the system 10 in the horizontally adjustable position would be without

such concern because horizontal placement of the track 12 and slider 14 would eliminate concern about gravitational effects possibly pulling the structures apart or compromising relative adjustability.

[0033] Still further, it will be understood that the system 10 easily accommodates engagement to alarm apparatus.

[0034] To create an immediate awareness of attempted disengagement between structures of the system 10 one could engage the alarm apparatus via a conductor to the throughbore 66, in known manner such that, when the connector 70 is disengaged from the throughbore 66, it will cause the alarm apparatus to activate, producing an alarm.

[0035] Alternatively, the open end 16 of the track 12 defining a noncommon point could be engaged to the alarm apparatus to indicate that the slide 14 was now in contact with the open end 16. Thus, it will be understood that various common points could be engaged in known manner to the alarm apparatus to indicated disengagement between various elements of system 10.

[0036] As described above, the system 10 provides a number of advantages, some of which have been described above and others which are inherent in the invention. Also, modifications may by proposed without departing from the teaching herein. Accordingly, the scope of the invention is only to be limited as necessitated by the accompanying claims.

Claims

1. A hanging system (10) for mounting an item to a vertical surface, the system (10) comprising a track (12) and a slider (14) slidably engaged to one another and including means for maintaining relative position therebetween, the track (12) having means for further engaging directly to either of said vertical surface (36) and said item (38) and the slider (14) having means for further engaging either of said item (38) and said vertical surface (36), wherein said track (12) defines a hollow channel (42) in one surface (44) thereof opposite a surface (48) thereof which is engageable to one of said item (38) and said vertical surface (36), wherein said slider (14) has a first surface (62) which rests along the engageable surface (48) of the track (12)
and has another surface which is opposite said first surface (62) and includes structure thereon extending through said channel (42) in said track (12) for engaging said slider (14) to one of said item (38) and said vertical surface (36), **characterized in that** said structure has a plurality, of through bores (34) therein for mounting said structure to engage either of said item (38) and said vertical surface (36).

2. The system (10) of claim 1 further including means for releasably locking the track (12) to the slider (14).

3. The system (10) of claim 1 wherein an alarm apparatus is engaged to at least one point common to at least two system structures in a manner such that disengagement of one of the structures causes alarm apparatus activation.

4. The system (10) of claim 2 wherein said track (12) has an open end (16) through which the slider (14) is engaged within said track (12) and said means for releasably locking said track (12) to said slider (14) comprise a threaded connector (70) secured across said open end (16) of said track (12).

5. The system (10) of claim (1) wherein said track (12) has a closed end (18) and said means for maintaining relative position between said track (12) and said slider (14) comprise a threaded member (24) extending through said closed end (18) of said track (12), said threaded member (24) having a tip (28) which seats within a hole (30) in an end wall (32) of said slider (14).

6. The system (10) of claim 1 wherein said first surface (62) includes at least a channel (60) along a length thereof.

7. The system (10) of claim 2 wherein an alarm apparatus is engaged to at least one noncommon point on the track (12) over which the slider (14) must pass during disengagement in a manner such that contact of the slider (14) with the noncommon point will cause alarm activation.

Patentansprüche

1. Aufhängungs-System (10) zur Befestigung eines Gegenstands an einer vertikalen Oberfläche, wobei das System (10) eine Schiene (12) und einen Schieber (14) umfaßt, die in gleitendem Eingriff miteinander stehen, sowie Mittel zur Aufrechterhaltung der relativen Anordnung zueinander, wobei die Schiene (12) Mittel aufweist, um des weiteren mit der vertikalen Oberfläche (36) und dem Gegenstand (38) in Eingriff gebracht zu werden und der Schieber (14) Mittel aufweist, um des weiteren mit dem Gegenstand (38) und der vertikalen Oberfläche (36) in Eingriff gebracht zu werden, wobei die Schiene (12) eine hohle Rinne (42) in einer Oberfläche (44) davon bildet, die einer Oberfläche (48) davon gegenüberliegt, die mit dem Gegenstand (38) oder der vertikalen Oberfläche (36) in Eingriff bringbar ist, wobei der Schieber (14) eine erste Oberfläche (62) aufweist, die sich entlang der in Eingriff bringbaren Oberfläche (48) der Schiene

(12) abstützt und eine andere Oberfläche, die der ersten Oberfläche (62) gegenüberliegt und einen Aufbau darauf beinhaltet, der sich durch die Rinne (42) in der Schiene (12) erstreckt, um den Schieber (14) auf den Gegenstand (38) oder der vertikalen Oberfläche (36) zu befestigen,
dadurch gekennzeichnet, daß
der Aufbau eine Vielzahl an Durchgangsbohrungen (34) darin zur Befestigung des Aufbaus aufweist, um den Gegenstand (38) und die vertikale Oberfläche (36) in Eingriff zu bringen.

2. Aufhängungs-System (10) nach Anspruch 1,
dadurch gekennzeichnet, daß
es Mittel umfaßt, um die Schiene (12) lösbar an dem Schieber (14) festzulegen.

3. Aufhängungs-System (10) nach Anspruch 1,
dadurch gekennzeichnet, daß
eine Alarmvorrichtung mit wenigstens einer Überlappungsstelle von wenigstens zwei Bestandteilen des Systems derart in Eingriff steht, daß ein Lösen eines der Bestandteile die Aktivierung der Alarmvorrichtung verursacht.

4. Aufhängungs-System (10) nach Anspruch 2,
dadurch gekennzeichnet, daß
die Schiene (12) ein offenes Ende (16) aufweist, durch welches der Schieber (14) mit der Schiene (12) in Eingriff gebracht ist und die Mittel zur lösbaren Befestigung des Schiebers (14) an der Schiene (12) ein Gewinde-Verbindungsstück (70) umfassen, das über das offene Ende (16) der Schiene (12) angebracht ist.

5. Aufhängungs-System (10) nach Anspruch 1,
dadurch gekennzeichnet, daß
die Schiene (12) ein geschlossenes Ende (18) aufweist und die Mittel zur Aufrechterhaltung der relativen Anordnung zwischen der Schiene (12) und dem Schieber (14) ein Gewindebauteil (24) umfassen, das sich durch das geschlossene Ende (18) der Schiene (12) erstreckt, wobei das Gewindebauteil (24) eine Spitze (28) aufweist, die sich in einer Öffnung (30) in einer Stirnwand (32) des Schiebers (14) abstützt.

6. Aufhängungs-System (10) nach Anspruch 1,
dadurch gekennzeichnet, daß
die erste Oberfläche (62) wenigstens abschnittsweise eine Rinne (60) aufweist.

7. Aufhängungs-System (10) nach Anspruch 2,
dadurch gekennzeichnet, daß
eine Alarmvorrichtung wenigstens mit einer Nicht-Überlappungsstelle auf der Schiene (12) in Eingriff steht, die der Schieber (14) beim Lösen passieren muß, so daß der Schieber (14) bei der Berührung mit der Nicht-Überlappungsstelle eine Alarmauslösung verursacht.

Revendications

1. Un système de suspension (10) destiné à la fixation d'un objet sur une surface verticale, ledit système (10) étant constitué par un rail porteur (12) et un rail curseur (14) s'engageant l'un sur l'autre par coulissement et comportant des moyens permettant le maintien d'une position relative entre eux, ledit rail porteur (12) pouvant par la suite être fixé soit directement à ladite surface verticale (36) soit audit objet (38), le rail curseur (14) pouvant à son tour être fixé soit audit objet (38) soit à ladite surface verticale (36), où le rail porteur (12) définit une cannelure concave (42) dans une surface (44) opposée à une autre surface (48) pouvant être fixée soit audit objet (38) soit à ladite surface verticale (36) et où ledit rail curseur (14) est pourvu d'une première surface (62) prenant appui le long de la surface (48) du rail porteur (12), ainsi que d'une deuxième surface opposée à ladite première surface (62) et comporte une structure s'étendant à travers ladite cannelure (42) dudit rail porteur (12) pour fixer ledit rail curseur (14) soit audit objet (38) soit à ladite surface verticale (36), **caractérisé en ce que** ladite structure comporte plusieurs trous de passage (34) pour la fixation du rail curseur (14) soit audit objet (38) soit à ladite surface (36).

2. Un système de suspension (10) selon la revendication 1 comportant également des moyens de verrouillage-déverrouillage du rail curseur (14) sur le rail porteur (12).

3. Un système de suspension (10) selon la revendication 1, où un dispositif d'alarme est monté au moins en un point commun d'au moins deux structures de système de manière à ce que le détachement de l'une des structures entraîne l'activation du dispositif d'alarme.

4. Un système de suspension (10) selon la revendication 2, où ledit rail porteur (12) présente une extrémité libre (16) par laquelle le rail curseur (14) est introduit à l'intérieur dudit rail porteur (12) et où lesdits moyens de verrouillage-déverrouillage du rail curseur (14) sur le rail porteur (12) incluent un élément fileté de contact (70) fixé transversalement par rapport à ladite extrémité libre (16) dudit rail porteur (12).

5. Un système de suspension (10) selon la revendication 1, où ledit rail porteur (12) comporte une extrémité fermée (18) et où lesdits moyens de maintien d'une position relative entre ledit rail porteur (12) et

ledit rail curseur (14) incluent un élément fileté (24) s'étendant par ladite extrémité fermée (18) dudit rail porteur (12), ledit élément fileté (24) présentant une pointe (28) prenant appui à l'intérieur d'un trou (30) pratiqué dans une paroi d'extrémité (32) dudit rail curseur (14).

6. Un système de suspension (10) selon la revendication 1, où la première surface (62) est pourvue d'au moins une cannelure (60) se déployant le long de son contour.

7. Un système de suspension (10) selon la revendication 2, où un dispositif d'alarme est monté dans au moins un point non-commun du rail porteur (12) par-dessus lequel doit passer le rail curseur (14) pendant le détachement, de manière à ce que, lors du contact entre le rail curseur (14) et le point non-commun, l'alarme soit activée.

FIG. 1

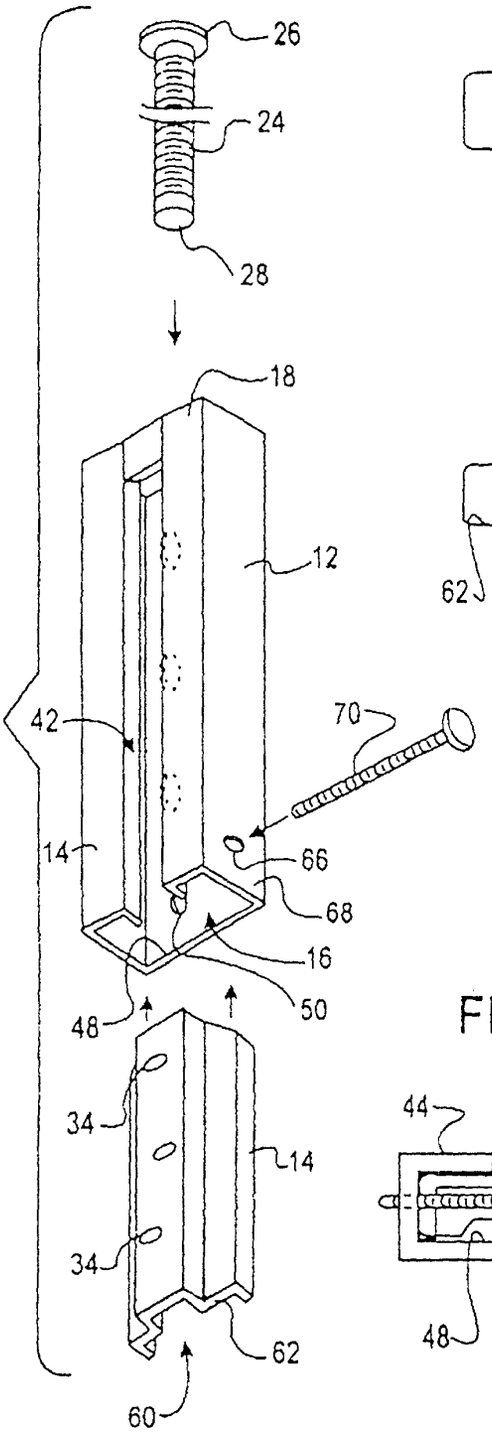

FIG. 2

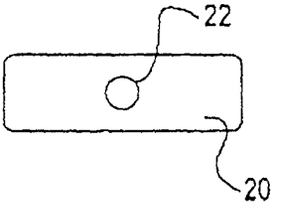

FIG. 3

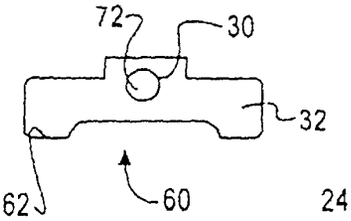

FIG. 4

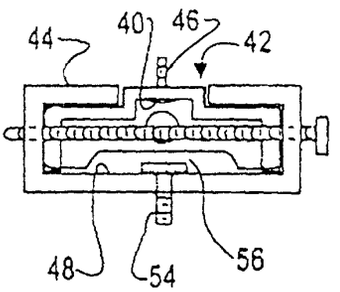

FIG. 5

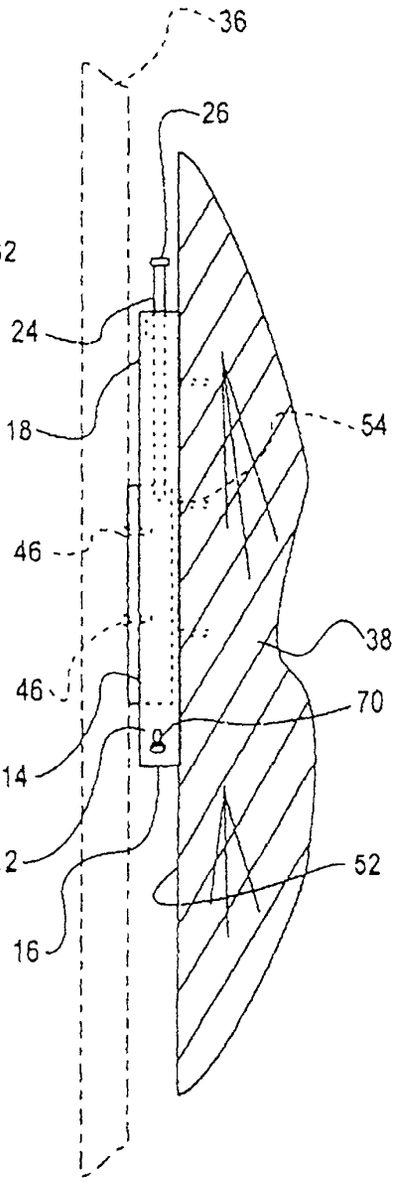

FIG. 6

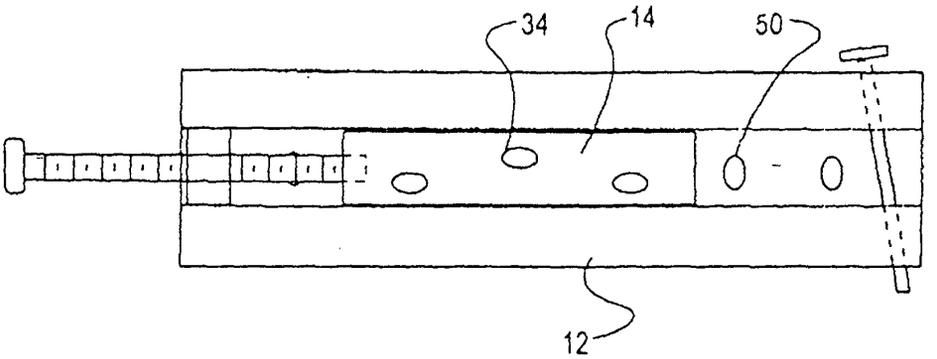

FIG. 7

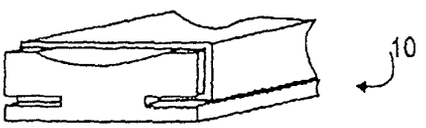

FIG. 8

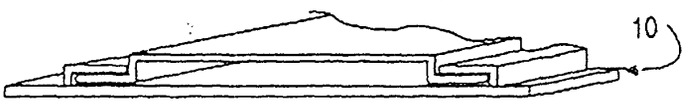

FIG. 10

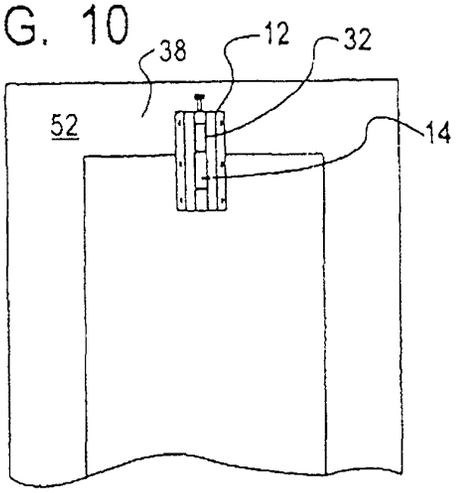

FIG. 11

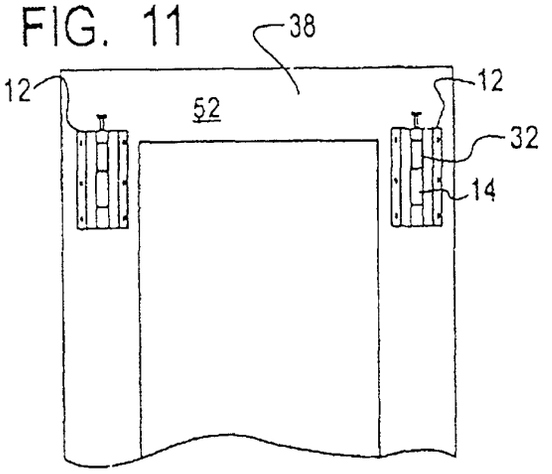

FIG. 12

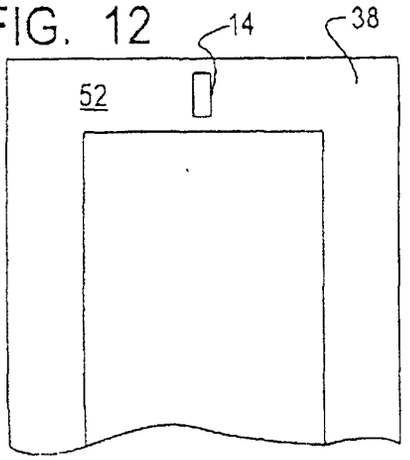

FIG. 13