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(54) **Hingeless enclosure for a display system**

Scharnierlose Hülle für ein Anzeigesystem

Boîtier pivotant sans charnières pour système d'affichage

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Description

[0001] The present invention relates to a display system and in particular to a display system for receiving a replaceable display panel supported by an enclosure as part of a modular display system.

[0002] It is often necessary to provide protective enclosures for display systems such as office directories or commercial signages. However, the requirements in terms of geometric configurations for such enclosures are so varied such that mass production of enclosures are hitherto not economical. As the contents of the display systems require frequent updating, the ideal enclosure should be light and versatile to permit easy access to the display system. Yet exposure of the display systems to the elements generally require the protective enclosures to be sturdy, durable and weather-proof.

[0003] Prior art hingeless assembly for a display system addresses partially the requirements of a modular display system that is economical, durable and versatile. U. S. Patent No. 4,968,171 teaches a hingeless extrusion which combines with other hingeless extrusion to form a multiple positionable, self-standing modular display system.

[0004] US Patent No. 4,873,776 discloses a hinged illuminated sign comprising a main frame and two panel frames for receiving a replaceable display panel. In order to update the display panel it is necessary to loosen a number of screws and other parts of the sign, which is very inconvenient. Therefore, the problem to be solved by the present invention is to provide for a display system that allows frequent updating in an easier way.

[0005] This problem is solved by a display system according to claim 1.

[0006] The present invention discloses a display system with a protective enclosure incorporated as part of a modular display system. The protective enclosure features a main frame and an open face panel frame. While the main frame and the open face panel frame are assembled from standardized extrusions and joints, an elongated cylindrical bead along one of the external edges of the main frame and a semi-cylindrical elongated groove along a corresponding edge of the open face panel frame are slidably fitted over one another to form a modular enclosure. The slot formed between the flange and the interior edge is provided for receiving one section of the display panel to be updated frequently. The frames of the enclosures are easily assembled and disassembled in view of a plurality of joints. A gasket is disposed along the hingeless assembly to weather-proof the enclosure. The hingeless assembly of the enclosure not only allows the open face panel to be opened for easy access, but also seals the interior of the display system from the elements when the open face panel is closed. As various components of the present invention are standardized and interchangeable, economy of scale in manufacturing the enclosure is achieved notwithstanding the myriad geometric configurations of dis-

play systems.

[0007] For a better understanding of the present invention and as to how the same may be carried into effect, reference will now be made by way of example to the accompanying drawings.

[0008] FIG 1 is an exploded, perspective view of an enclosure incorporating the present invention.

[0009] FIG 1A is a front, right side, cross-sectional view of a hingeless assembly for a display system in accordance to the preferred embodiment of the present invention.

[0010] Fig. 1 is an exploded, perspective view of a display system incorporating a protective enclosure according to the preferred embodiment of the present invention. The enclosure 10 comprises a main frame 11 and an open face panel frame 22. The main frame 11 further comprises a top main frame 12, a bottom main frame 14, and side main frames 16 and 18. In the preferred embodiment of the invention, all the frames are made of aluminium extrusions or any suitable light weight material. It should be understood by one skilled in the art that the main frames 14, 16 and 18 are preferably standardized and interchangeable. The frames of the main frame 11 are coupled with a plurality of main frame joints 20 to form a substantially rectangular configuration. Even though the main frames 12, 14, 16 and 18 are shown be single sided (having one elongated cylindrical bead on only one side edge of the frame), it should be understood by one skilled in the art that the present invention is equally applicable to a double sided main frame (having one elongated cylindrical beads on each side edge of the frame). The main frame joints 20 are standardized and interchangeable. Preferably the main frame joints are made of either aluminium, or other suitable weather-proofing materials. Although the main frame joints 20 are illustrated as rounded, it should not be taken as a limitation upon the present invention. For example, a right angle joint may be substituted for the round joint 20.

[0011] Referring again to Fig. 1, the open face panel 22 frame further comprises a top panel frame 24, a bottom panel frame 26, and side panel frames 28 and 30. Just as the main frame, the panel frames are made of aluminium extrusions or any suitable light weight material. It should be understood by one skilled in the art that the panel frames 24, 26 and 28 are preferably standardized and interchangeable. The frames of the open face panel frame 22 are coupled with a plurality of panel frame joints 32 to form a substantially rectangular configuration. Like the main frame joints, the panel frame joints 32 are also standardized and interchangeable. In the preferred embodiment of the present invention, the panel frame joints are made of suitable weather-proofing materials. Although the main panel joints 32 are illustrated as rounded, it should not be taken as a limitation upon the present invention. For instance, a right angle joint is interchangeable with the round joint 32. It is also understood that the open face panel frame 22 en-

closes a transparent panel which is not shown in order not to obscure the presentation of the present invention.

[0012] It follows from the prevalent use of standardized and interchangeable extrusions and joints in the present invention that a modular enclosure fitting a large variety of display system may be manufactured economically. It should be understood by one skilled in the art that the present invention is versatile as the enclosures are easily assembled and disassembled. One further advantage of the present invention will be described below in connection with the description of the hingeless assembly.

[0013] The main frame 11 and the open face panel frame 22 are coupled in the manner illustrated in Fig. 1A where a front, right side, cross-sectional view of a hingeless assembly in accordance with the preferred embodiment of the present invention is illustrated. The top main frame 12 is shown having an L-shaped cross-section having a horizontal edge 17 and a vertical side edge 19. An elongated cylindrical bead 13 and an elongated extending portion 15 extend outwards from the side edge 19 for slidably engaging an elongated semi-cylindrical groove 25 of the top panel frame 24. The side edge 19 terminates in a elongated recess channel 33 for receiving the base of a gasket (not shown). The gasket is used for sealing the interior of the enclosure from the elements. The gasket is preferably made from silicon, rubber or other suitable weather-proofing materials.

[0014] In Fig. 1A the top panel frame 24 has a substantially rectangular cross section. It should be understood by one skilled in the art that a large variety of cross-sectional configurations is possible for the top frame panel to have as long as it incorporates an elongated semi-cylindrical groove. For an example, see the U.K. design registration application No. 2032782 filed by the same applicant. As described briefly in the preceding paragraph, the top panel frame has a semi-cylindrical groove 25 disposed between the top edge and the edge facing the side edge 19 of the top main frame. The groove 25 terminates in edges 27 and 29 respectively. While the groove 25 receives the elongated cylindrical bead 13 in an interlocking manner, the edges 27 and 29 permit the open face panel frame 22 to rotate around an axis which is parallel to the longitudinal axis of the elongated cylindrical bead 13. The angle of rotation depends on (1) the depth of the groove edges 27 and 29, and (2) the thickness of the elongated extended portion 15. On the same edge facing the side edge 19 is disposed an elongated semi-circular channel 35 which cooperates with the elongated recess channel 33 to accommodate the gasket (not shown) along the hingeless assembly. When the hingeless assembly in Fig. 1A is closed, the gasket performs the weather-proofing function of the enclosure. The top panel frame 24 also has a flange 21 and interior edge 23 for receiving one section of a display panel (not shown). It follows from the above that the hingeless assembly permits

easy access to the interior of the enclosure. At the same time, the gasket disposed along the hingeless assembly prevents dust, dirt and water from entering the enclosure.

[0015] Referring again to Fig. 1, reinforce bracket assemblies 34 and 36 are optionally employed to provide additional stability to the structure of the main frame 11 and the open face panel frame 22 respectively. Furthermore, an assembly consisting of a stiffener 38 and stiffener holder 40 may be used to provide rigidity to the enclosure 10. Finally a lock 42 may optionally be added to the bottom main frame 14 in order to secure the open face panel frame 22 to the main frame 11 and to prevent unauthorized access to the display system.

[0016] The main frame and the panel frame forms a self-standing enclosure when said panel frame is closed over at least one open face of said main frame.

[0017] While the present invention has been described particularly with reference to Figs. 1 to 1A with emphasis on a hingeless assembly for a protective enclosure for a display system, it should be understood that the figures are for illustration only and should not be taken as a limitation on the invention. For example, the hingeless assembly of the enclosure can be located along the side main frames or even the bottom main frame. Thus, the open face panel frame may be opened from the side or from the bottom as opposed to from the top frame as illustrated in Figs 1 to 1A. In addition, it is clear that the apparatus of the present invention has utility in many applications where versatile, modular and durable enclosure is required. It is contemplated that many changes and modifications may be made by one of ordinary skill in the art without departing from the scope of the invention as defined by the appended claims.

Claims

1. A display system for receiving a replaceable display panel supported by an enclosure (10) comprising:
 - a main frame (11), said main frame further comprising at least a top main frame member (12), a bottom main frame member (14) and a pair of side main frame members (16, 18);
 - a panel frame (22) for enclosing at least one open face of said enclosure (10), said panel frame (22) further comprising at least a top panel frame member (24), a bottom panel frame member (26) and a pair of side panel frame members (28, 30);
 - a hingeless assembly having an elongated cylindrical bead (13) extending from any one of the external edges of said main frame members (12), said hingeless assembly further having an elongated semi-cylindrical groove (25) extending from any one of the edges facing said ex-

ternal edges of said main frame members (12), said groove (25) being slidably fitted with said bead (13);
such that said panel frame (21) rotates around an axis parallel to the longitudinal axis of said bead (13),

whereby

the top panel frame member (24) is formed with a groove between a flange (21) and an interior edge (23) for receiving and enclosing the display panel and the panel frame members (24, 26, 28, 30) are detachably coupled with a plurality of panel frame joints (32) allowing that the panel frame can be easily assembled and disassembled.

2. The display system according to claim 1 wherein said main frame (11) and said panel frame (22) forms a self-standing enclosure when said panel frame is closed over at least one open face of said main frame.

3. The display system according to claim 1 or 2 wherein said groove (25) further having two extending edges (27, 29) for retaining said bead (13) within said groove (25).

4. The display system as claimed in any one of claims 1 to 3, wherein said panel frame members (24, 26, 28, 30) have a substantially rectangular cross-section.

5. The display system as claimed in any preceding claim, wherein said main frame members (12, 14, 16, 18) are connected by main frame joints (20).

6. The display system as claimed in claim 5, wherein said main frame joints (20) are rounded.

7. The display system according to any preceding claim, wherein said panel frame joints (32) are rounded.

8. The display system according to any preceding claim wherein said hingeless assembly further having an elongated gasket for tightly sealing an interface between the main frame (11) and said panel frame (22).

9. The display system as claimed in any preceding claim comprising a stiffener (38) for providing a rigidity to said enclosure (10).

Patentansprüche

1. Anzeigesystem zur Aufnahme einer in einem Gehäuse (10) gehaltenen Anzeigetafel mit:

einem Hauptrahmen (11), der wenigstens ein oberes Hauptrahmenteil (12), ein unteres Hauptrahmenteil (14) und ein Paar von Seitenrahmenteil (16, 18) aufweist;

mit einem Tafelrahmen (22) zum Abschließen der wenigstens einen offenen Seite des Gehäuses (10), wobei der Tafelrahmen (22) wenigstens ein oberes Tafelrahmenteil (24), ein unteres Tafelrahmenteil (26) und ein Paar von Seitentafelrahmenteil (28, 30) aufweist;

einer scharnierlosen Anordnung mit einem gestreckten zylindrischen Kopf (13), der sich entlang einer der äußeren Ränder des Hauptrahmenteil (12) erstreckt, wobei die scharnierlose Anordnung weiter über eine gestreckte halbzylindrische Nut (25) verfügt, die sich entlang einer der Ränder erstreckt, die auf die äußeren Ränder des Hauptrahmenteil (12) gerichtet ist, wobei die Nut (25) und der Kopf (13) so verschiebbar ineinandergreifen,

daß der Tafelrahmen (22) um eine Achse drehbar ist, welche sich parallel zur Längsachse des Kopfes (13) erstreckt,

wobei das obere Hauptrahmenteil (24) mit einer Nut versehen ist, die sich zwischen einem Flansch (21) und einer Innenkante (23) zur Aufnahme und zum Einschließen der Anzeigetafel erstreckt und wobei die Tafelrahmenteile (24, 26, 28, 30) mit einer Vielzahl von Tafelrahmenverbindern (32) lösbar gekoppelt sind, die es gestatten, daß der Tafelrahmen leicht zusammengefügt und auseinandergenommen werden kann.

2. Anzeigesystem nach Anspruch 1, bei dem der Hauptrahmen (11) und der Tafelrahmen (22) ein standfestes Gehäuse bilden, wenn der Tafelrahmen über wenigstens einer offenen Seite des Hauptrahmens geschlossen ist.

3. Anzeigesystem nach Anspruch 1 oder 2, bei dem die Nut (25) zwei langgestreckte Ränder (27, 29) zum Halten des Kopfes (13) innerhalb der Nut (25) aufweist.

4. Anzeigesystem nach einem der Ansprüche 1 bis 3, bei dem die Tafelrahmenteile (24, 26, 28, 30) einen im wesentlichen rechteckigen Querschnitt aufweisen.

5. Anzeigesystem nach einem der vorstehenden Ansprüche, bei dem die Hauptrahmenteile (12, 14, 16, 18) durch Hauptrahmenverbinder (20) zusammengehalten sind.

6. Anzeigesystem nach Anspruch 5, bei dem die Hauptrahmenverbinder (20) gerundet sind.
7. Anzeigesystem nach einem der vorstehenden Ansprüche, bei dem die Tafelrahmenverbinder (32) gerundet sind.
8. Anzeigesystem nach einem der vorstehenden Ansprüche, bei dem die scharnierlose Anordnung eine gestreckte Dichtung zum engen Abdichten des Übergangs zwischen dem Hauptrahmen (11) und dem Tafelrahmen (22) aufweist.
9. Anzeigesystem nach einem der vorstehenden Ansprüche mit einem Versteifer (38) zum Versteifen des Gehäuses (10).

Revendications

1. Un système d'affichage destiné à recevoir un panneau d'affichage qui est placé sur une enceinte (10), comprenant:
- un châssis principal (11), ledit châssis principal comprenant en outre au moins un élément supérieur de châssis principal (12), un élément inférieur de châssis principal (14), ainsi qu'une paire d'éléments latéraux de châssis principal (16, 18);
 - un châssis de panneau (22) permettant d'entourer au moins un côté ouvert de ladite enceinte (10), ledit châssis de panneau (22) comprenant en outre au moins un élément supérieur de châssis de panneau (24), un élément inférieur de châssis de panneau (26), ainsi qu'une paire d'éléments latéraux de châssis de panneau (28, 30);
 - un ensemble sans charnière comprenant une nervure cylindrique allongée (13) se prolongeant à partir de l'un quelconque des bords externes desdits éléments de châssis principal ((12), ledit ensemble non articulé comprenant en outre une rainure semi-cylindrique allongée (25) se prolongeant à partir de l'un quelconque des bords faisant face audits bords externes desdits éléments de châssis principal (12), ladite rainure (25) pouvant recevoir ladite nervure (13) en coulissant; de telle sorte que ledit châssis de panneau (21) tourne autour d'un axe parallèle à l'axe longitudinal de ladite nervure (13),

caractérisé en ce que

l'élément supérieur de châssis de panneau (24) est composé d'une rainure entre une collerette (21) et un bord interne (23) permettant de recevoir et d'entourer le panneau d'affichage et les éléments de

châssis de panneau (24, 26, 28, 30) sont couplés de manière détachable avec une pluralité d'éléments de liaison (32) de châssis de panneau permettant un montage et un démontage aisés du châssis de panneau.

2. Système d'affichage selon la revendication 1, **caractérisé en ce que** ledit châssis principal (11) et ledit châssis de panneau (22) forment une enceinte pouvant tenir debout par elle-même lorsque ledit châssis de panneau est rabattu sur au moins un côté ouvert dudit châssis principal.
3. Système d'affichage selon la revendication 1 ou 2, **caractérisé en ce que** ladite rainure (25) comporte en outre deux bords (27, 29) se prolongeant pour retenir ladite nervure (13) à l'intérieur de ladite rainure (25).
4. Système d'affichage selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** lesdits éléments de châssis de panneau (24, 26, 28, 30) présentent une section transversale principalement rectangulaire.
5. Système d'affichage selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** lesdits éléments de châssis principal (12, 14, 16, 18) sont connectés par l'intermédiaire d'éléments de liaison (20) de châssis principal.
6. Système d'affichage selon la revendication 5, **caractérisé en ce que** lesdits éléments de liaison (20) de châssis principal sont de forme arrondie.
7. Système d'affichage selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** lesdits éléments de liaison (32) de châssis de panneau sont de forme arrondie.
8. Système d'affichage selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** ledit ensemble sans charnière comporte en outre un joint d'étanchéité allongé pour jouer le rôle d'interface étanche entre le châssis principal (11) et ledit châssis de panneau (22).
9. Système d'affichage selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend un raidisseur (38) permettant de donner de la rigidité à ladite enceinte (10).

