AN ILLUMINATION ASSEMBLY FOR ANNUNCIATOR

Field of the Invention

This invention relates to an illumination assembly, and more particularly to an illumination assembly including a light emitting diode assembly, which can be used in wide range of application such as an annunciator or other displaying means.

Description of Related Arts

An alarm annunciator is a device having a visual display that signals the presence of an abnormal condition such as a defect of a process. When the annunciator signals a problem, a user can identify the malfunction almost instantly as each element constantly transmits information to a central control panel. In recent years, high technical performance of the alarm annunciator, especially performance on the modular display or illumination unit has attracted interests among users and manufacturers.

Configuration of the modular display unit is usually incorporated with light emitter. Said approach has been disclosed in the prior arts, for example, U.S. Patent No.4251853 A. In said patent, several circuit boards are placed on top of each other by means of connectors. The light bulbs are inserted on a printed circuit card that is placed in each housing section. Another example is disclosed in U.S. Publication No. 2013/0063937 A1. The LED-type illuminating module of said publication is constructed to improve the heat radiation performance of its LED illuminator assembly.

These LED display units however, comprise several different features from the devices of the present invention. As such, they are much more complicated and it is not easy to change during function failure. Accordingly, there is a need to provide an alternative LED illumination assembly that can circumvent aforementioned disadvantages characteristic ~~exist~~ in the prior art.

Brief Description of the Drawings

The features of the invention will be more readily understood and appreciated from the following detailed description when read in conjunction with the accompanying drawings of the preferred embodiment of the present invention, in which:

Fig. 1 is a diagram showing an exploded view of an illumination assembly.

Fig. 2a is a diagram showing an isometric view of a mounting and a display assembly assembled with a bezel holder and an electrical connection means.

Fig. 2b is a diagram showing another isometric view of the mounting and the display assembly assembled with the bezel holder and the electrical connection means.

Fig. 3a is a diagram showing an isometric view of an assembled illumination assembly.

Fig. 3b is a diagram showing another isometric view of the assembled illumination assembly.

Fig. 4 is a diagram showing a top view of a plurality of illumination assembly in dissembled condition.

Fig. 5 is a diagram showing a top view of a plurality of assembled illumination assembly.

Fig. 6 is a diagram showing an arrangement of external printed circuit boards connected with the illumination assembly.

Detailed Description of the Invention

As required, detailed embodiments of the present invention are disclosed herein; however , it is to be understood that the disclosed embodiments are merely exemplary of the invention, which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are; not to be interpreted as limiting but merely as a basis for claims. It should be understood that the drawings and detailed description thereto are not intended to limit the invention to the particular form disclosed, but on the contrary, the invention is to cover all modifications, equivalents and alternatives falling within the scope of the present invention as defined by the appended claims. As used throughout this application, the word "may" is used in a permissive sense (i.e., meaning having the potential to), rather than the mandatory sense (i.e., meaning must). Similarly, the words "include," "including," and "includes" mean including, but not limited to. Further, the words "a" or "an" mean "at least one" and the word "plurality" means one or more, unless otherwise mentioned. Where the abbreviations or technical terms are used, these indicate the commonly accepted meanings as known in the technical field. For ease of reference, common reference numerals will be used throughout the figures when referring to the same or similar features common to the figures. The present invention will now be described with reference to Figs.1-6.

The present invention presents an illumination assembly to be used in a wide range of applications including the annunciator manufacturing iindustry. Said illumination assembly comprises of a display assembly (11), a bezel holder (24) and characterized by: the display assembly (11) comprising a bezel (12) enclosing a display panel (13); an electrical connection means (17) comprising a printed circuit board (18) with an illuminator such as a light emitting diode (LED), a pair of springs (19a and 19b) for contacting with positive and negative terminals of said printed circuit board (18), a spring holder (20) comprising a pair of hollow protruding tubes (21a and 21b) for holding the pair of springs (19a and 19b); a bezel holder (24) having a plurality of legs (26) for receiving the bezel (12) and the electrical connection means (17); and a mounting (27) having a plurality of aapertures (28) complementary to the pair of hollow protruding tubes (21a and 21b) and the plurality of legs (26) of the bezel holder (24) to receive and secure said bezel holder (24) there within.

In a preferred embodiment of the illumination assembly, the spring holder (20) further comprises a platform (22) having a plurality of studs (23) for engaging with the bezel holder (24).

In a preferred embodiment of the illumination assembly, the bezel holder (24) further comprises

a plurality of guide slots (261) for receiving the plurality of studs (23) of the spring holder (20).

In a preferred embodiment of the illumination assembly, the printed circuit board (18) is preferably a light emitting diode (LED) printed circuit board.

In a preferred embodiment of the illumination assembly, said mounting (27) is made from nylon.

In a preferred embodiment of the illumination assembly, said illumination assembly is operated by connecting the pair of springs (19a and 19b) to an external printed circuit board connected to a power supply. In a preferred embodiment, the external printed circuit board includes a motherboard (40) comprises the power supply connector, a CPU board (41), a relay (42), and an input/output (1/0) board (43).

In another preferred embodiment of the illumination assembly, said printed circuit board (18) is replaceable and removed by using a finger to lift the plurality of legs (26) of the bezel holder (24) followed by removing the spring holder (20).

Referring to Fig. 1, an exploded view of the illumination assembly is illustrated. As can be seen from said Fig. 1, the display assembly (11) comprises of the bezel (12) and one or more display panels (13). In a preferred embodiment of the present invention, the display assembly (11) further comprises the diffuser (14) for diffusing light illuminated from the light emitting diode of the printed circuit board. The filter (13) is preferably a polymer sheet. The diffuser (14), the filter (13) and the display panel (13) are held together by the bezel (12), and more particularly, seated within the bezel (12). The cover plate (16) covers a top of the bezel (16) and said cover plate (16) is transparent, coloured, or translucent. The cover plate (16) is preferably a window lens. The filter (13) is optionally used in said display assembly (11). Said filter (15) may include engraved words or designs, if the display panel (13) is not in use.

Said bezel (12) is preferably made from a plastic material including an acrylonitrile butadiene styrene copolymer (ABS) plastic material. Said bezel (12) further comprises an indentation (32) at an external surface of said bezel (12) for guiding insertion of the illumination assembly to a bezel structure of an annunciator; and an engaging portion (33) at an inner surface of said bezel (12) to hold the diffuser (14), the filter (15) and the display panel (13). The filter (15) is

preferably a transparent, coloured or translucent filter, made from an acrylic material. The display panel (13) is a panel having a displayed message applied on said display panel by means of printing, drawing, and/or colouring. Said display panel (13) is preferably made from a paper material or a plastic material.

In the preferred embodiment of the present invention, the diffuser (14), the filter (15) and the display panel (13) are placed within the bezel holder (24). The filter (15) is preferably sandwiched between the display panel (13) and the diffuser (14). The bezel (12) is then coupled to said bezel holder (24) and secured therewith by engaging the engaging portion (33) of the bezel (12) to the second indentation (34) of the bezel holder (34). The cover plate (16) that preferably made from a plastic material including a poly(methyl methylacrylic) acryrex material, is coupling to top ,of the bezel (12) for protecting the filter (15) from dust and a,l,low better illumination effect.

The bezel holder (24) includes the head portion (25) and the plurality of legs (26). The head portion (25) having a top open end for receiving the display assembly (11), and bottom open end for receiving the electrical connection means (17). A second indentation (34) positions at an external periphery of said head portion (25) to ease the coupling of the display assembly (11) and the bezel holder (24), by ensuring the indentation (32) of the bezel (12) aligns with the second indentation (34) of the bezel holder (24). Extended from bottom periphery of said head portion (25) are the plurality of legs (26), and the guide slot (261) for receiving entry of the protruding studs (23) of the spring holder (20).

When coupling the spring holder (20) to the bezel holder (24), the plurality of studs (23) sits inside the opening (36) of the guide slot (261) and secured there with.

Still referring to Fig. 1, the electrical connection means (17) comprises of the printed circuit board (18); the springs (19a and 19b), and the spring holder (20). The printed circuit board (18) comprises an illuminator (181) including the light emitting diode (LED), a positive terminal and a negative terminal. In order to reduce cost of maintaining said illumination assembly, the light emitting diode used in the present invention is preferably the white SMD (surface mount diode) LED. The spring holder (20) comprises of the platform (22); and the pair of hollow protruding tube (21a and 21b) for holding the pair of springs (19a and 19b). The springs (19a and 19b) are each seated in the hollow protruding tube (21a and 21b) and connected to the positive termina-l and the negative terminal of the printed circuit board (18). The electrical connection means (17)

is preferably coupled to the bezel holder (24) from bottom of said bezel holder (24). The platform of the spring holder (20) further comprises a plurality of studs (23) for receiving into the guide slot (261) of the bezel holder (24) , more particularly the plurality of studs (23) fit inside the opening (36) of the guide slot (261), to secure the printed circuit board(18) and the spring holder (20) in position.

With reference to Fig. 1, Fig. 2a and 2b, the mounting (27) includes the plurality of apertures (28) at bottom of said mounting (27) for receiving the pair of hollow protruding tubes (21a and 21b) and the plurality of legs (26) of the bezel holder (24)and secure said bezel holder (24) therewith . Said mounting (27) is preferably made from nylon, for example Nylon 66. At outer periphery of the mounting (27), there are a plurality of channels (29) and protrusions (30). The configuration of said extrusions (29) and protrusions (30) enable easy installation of said mounting(27) or said illumination assembly (28) into the annunciator, by matching and fitting shapes of the channels (29) and protrusions (30) of said mounting to a complementary channels and protrusions of the annunciator.

In a preferred embodiment, ssaid illumination assembly is mounted within an annunciator comprises of the external printed circuit board. As can be seen in Fig. 6, the external printed circuit board is preferably comprises of the motherboard (40), the CPU board (41), the relay (42), the input/output (1/0) board (43) and arear board (44). The relay (42) is preferably a R-Relay. More particularly, the pair of the spring (19a and 19b) is connected with the motherboard (40) and to the power supply. The annunciator is extendable by adding the 1/0 board (43) to a desired amount depending on the need of a user.

In operation, a power is supplied to the external printed circuit board and to said illumination assembly causes the illuminator to illuminate and thereby resulting the message to be seen from the cover plate (16). Said illumination assembly requires small current (approximately 0.75 MmA) in operation and hence reduces maintenance cost. In the case of failure of the illuminator, said printed circuit board (18) is replaceable and can be removed by lifting the bezel holder (24) to disengage the plurality of legs (26) from the plurality of apertures (28), and then removing the spring holder (20) by disengaging the plurality of studs (23) from the opening (36) of the guide slot (261). Said configuration can eliminate the utilization of any external tool in assembly, installation and dismantlement.

Although the present invention has been described with reference to specific embodiments , also shown in the appended figures, it will be apparent for those skilled in the art that many variations and modifications can be done within the scope of the invention as described in the specification and defined in the following claims.

Description of the reference numerals used in the accompanying drawings according to the present invention:

Reference Numerals	Description
11	Display assembly
12	Bezel
13	Display panel
14	Diffuser
15	Filter
16	Cover plate
17	Electrical connection means
18	Printed circuit board
181	Illuminator
19a and19b	Spring
20	Spring holder
21a and 21b	Hollow protruding tube
22	Platform of spring holder
23	Stud
24	Bezel holder
25	Head portion of bezel holder
26	Leg of bezel holder
261	Guide slot
27	mounting
28	Aperture of mounting
29	Channel of external surface of mounting
30	Protrusion
32	Indentation of bezel

33	Engaging portion of bezel
34	Second indentation of head portion of bezel holder
36	Opening of the guide slot
40	Motherboard
41	CPU
42	Relay
43	Input/Output (I/O) Board
44	Rear Board

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Configuration of the modular display unit is usually incorporated with light emitter. Said approach has been disclosed in the prior arts, for example, U.S. Patent No.4251853 A. In said patent, several circuit boards are placed on top of each other by means of connectors. The light bulbs are inserted on a printed circuit card that is placed in each housing section. Another example is disclosed in U.S. Publication No. 2013/0063937 A1. The LED-type illuminating module of said publication is constructed to improve the heat radiation performance of its LED illuminator assembly.

These LED display units however, comprise several different features from the devices of the present invention. As such, they are much more complicated and it is not easy to change during function failure. Accordingly, there is a need to provide an alternative LED illumination assembly that can circumvent aforementioned disadvantages characteristic in the prior art.

Brief Description of the Drawings

The features of the invention will be more readily understood and appreciated from the following detailed description when read in conjunction with the accompanying drawings of the preferred embodiment of the present invention, in which:

Fig. 1 is a diagram showing an exploded view of an illumination assembly.

Fig. 2a is a diagram showing an isometric view of a mounting and a display assembly assembled with a bezel holder and an electrical connection means.

Fig. 2b is a diagram showing another isometric view of the mounting and the display assembly assembled with the bezel holder and the electrical connection means.

Fig. 3a is a diagram showing an isometric view of an assembled illumination assembly.

Fig. 3b is a diagram showing another isometric view of the assembled illumination assembly.

Fig. 4 is a diagram showing a top view of a plurality of illumination assembly in dissembled condition.

Fig. 5 is a diagram showing a top view of a plurality of assembled illumination assembly.

Fig. 6 is a diagram showing an arrangement of external printed circuit boards connected with the illumination assembly.

Detailed Description of the Invention

As required, detailed embodiments of the present invention are disclosed herein; however , it is to be understood that the disclosed embodiments are merely exemplary of the invention, which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting but merely as a basis for claims. It should be understood that the drawings and detailed description thereto are not intended to limit the

invention to the particular form disclosed, but on the contrary, the invention is to cover all modifications, equivalents and alternatives falling within the scope of the present invention as defined by the appended claims. As used throughout this application, the word "may" is used in a permissive sense (i.e., meaning having the potential to), rather than the mandatory sense (i.e., meaning must). Similarly, the words "include," "including," and "includes" mean including, but not limited to. Further, the words "a" or "an" mean "at least one" and the word "plurality" means one or more, unless otherwise mentioned. Where the abbreviations or technical terms are used, these indicate the commonly accepted meanings as known in the technical field. For ease of reference, common reference numerals will be used throughout the figures when referring to the same or similar features common to the figures. The present invention will now be described with reference to Figs.1-6.

The present invention presents an illumination assembly to be used in a wide range of applications including the annunciator manufacturing industry. Said illumination assembly comprises a display assembly (11), a bezel holder (24) and characterized by: the display assembly (11) comprising a bezel (12) enclosing a display panel (13); an electrical connection means (17) comprising a printed circuit board (18) with an illuminator such as a light emitting diode (LED), a pair of springs (19a and 19b) for contacting with positive and negative terminals of said printed circuit board (18), a spring holder (20) comprising a pair of hollow protruding tubes (21a and 21b) for holding the pair of springs (19a and 19b); a bezel holder (24) having a plurality of legs (26) for receiving the bezel (12) and the electrical connection means (17); and a mounting (27) having a plurality of apertures (28) complementary to the pair of hollow protruding tubes (21a and 21b) and the plurality of legs (26) of the bezel holder (24) to receive and secure said bezel holder (24) there within.

In a preferred embodiment of the illumination assembly, the spring holder (20) further comprises a platform (22) having a plurality of studs (23) for engaging with the bezel holder (24).

In a preferred embodiment of the illumination assembly, the bezel holder (24) further comprises a plurality of guide slots (261) for receiving the plurality of studs (23) of the spring holder (20).

In a preferred embodiment of the illumination assembly, the printed circuit board (18) is preferably a light emitting diode (LED) printed circuit board.

In a preferred embodiment of the illumination assembly, said mounting (27) is made from nylon.

In a preferred embodiment of the illumination assembly, said illumination assembly is operated by connecting the pair of springs (19a and 19b) to an external printed circuit board connected to a power supply. In a preferred embodiment, the external printed circuit board includes a motherboard (40) comprises the power supply connector, a CPU board (41), a relay (42), and an input/output (1/0) board (43).

In another preferred embodiment of the illumination assembly, said printed circuit board (18) is replaceable and removed by using a finger to lift the plurality of legs (26) of the bezel holder (24) followed by removing the spring holder (20).

Referring to Fig. 1, an exploded view of the illumination assembly is illustrated. As can be seen from said Fig. 1, the display assembly (11) comprises of the bezel (12) and one or more display panels (13). In a preferred embodiment of the present invention, the display assembly (11) further comprises the diffuser (14) for diffusing light illuminated from the light emitting diode of the printed circuit board. The filter (13) is preferably a polymer sheet. The diffuser (14) the filter (13) and the display panel (13) are held together by the bezel (12), and more particularly, seated within the bezel (12). The cover plate (16) covers a top of the bezel (16) and said cover plate (16) is transparent, coloured, or translucent. The cover plate (16) is preferably a window lens. The filter (13) is optionally used in said display assembly (11). Said filter (15) may include engraved words or designs, if the display panel (13) is not in use.

Said bezel (12) is preferably made from a plastic material including an acrylonitrile butadiene styrene copolymer (ABS) plastic material. Said bezel (12) further comprises an indentation (32) at an external surface of said bezel (12) for guiding insertion of the illumination assembly to a bezel structure of an annunciator; and an engaging portion (33) at an inner surface of said bezel (12) to hold the diffuser (14), the filter (15) and the display panel (13). The filter (15) is preferably a transparent, coloured or translucent filter, made from an acrylic material. The display panel (13) is a panel having a displayed message applied on said display panel by means of printing, drawing, and/or colouring. Said display panel (13) is preferably made from a paper material or a plastic material.

In the preferred embodiment of the present invention, the diffuser (14), the filter (15) and the display panel (13) are placed within the bezel holder (24). The filter (15) is preferably sandwiched between the display panel (13) and the diffuser (14). The bezel (12) is then coupled to said bezel holder (24) and secured therewith by engaging the engaging portion (33) of the bezel (12) to the second indentation (34) of the bezel holder (34). The cover plate (16) that preferably made from a plastic material including a poly(methyl methylacrylic) acryrex material, is coupling to top ,of the bezel (12) for protecting the filter (15) from dust and allow better illumination effect.

The bezel holder (24) includes the head portion (25) and the plurality of legs (26). The head portion (25) having a top open end for receiving the display assembly (11), and bottom open end for receiving the electrical connection means (17). A second indentation (34) positions at an external periphery of said head portion (25) to ease the coupling of the display assembly (11) and the bezel holder (24), by ensuring the indentation (32) of the bezel (12) aligns with the second indentation (34) of the bezel holder (24). Extended from bottom periphery of said head portion (25) are the plurality of legs (26), and the guide slot (261) for receiving entry of the protruding studs (23) of the spring holder (20).

When coupling the spring holder (20) to the bezel holder (24), the plurality of studs (23) sits inside the opening (36) of the guide slot (261) and secured there with.

Still referring to Fig. 1, the electrical connection means (17) comprises of the printed circuit board (18); the springs (19a and 19b), and the spring holder (20). The printed circuit board (18) comprises an illuminator (181) including the light emitting diode (LED), a positive terminal and a negative terminal. In order to reduce cost of maintaining said illumination assembly, the light emitting diode used in the present invention is preferably the white SMD (surface mount diode) LED. The spring holder (20) comprises of the platform (22); and the pair of hollow protruding tube (21a and 21b) for holding the pair of springs (19a and 19b). The springs (19a and 19b) are each seated in the hollow protruding tube (21a and 21b) and connected to the positive terminal and the negative terminal of the printed circuit board (18). The electrical connection means (17) is preferably coupled to the bezel holder (24) from bottom of said bezel holder (24). The platform of the spring holder (20) further comprises a plurality of studs (23) for receiving into the guide slot (261) of the bezel holder (24) , more particularly the plurality of studs (23) fit inside the opening (36) of the guide slot (261), to secure the printed circuit board(18) and the spring holder (20) in position.

With reference to Fig. 1, Fig. 2a and 2b, the mounting (27) includes the plurality of apertures (28) at bottom of said mounting (27) for receiving the pair of hollow protruding tubes (21a and 21b) and the plurality of legs (26) of the bezel holder (24)and secure said bezel holder (24) therewith . Said mounting (27) is preferably made from nylon, for example Nylon 66. At outer periphery of the mounting (27), there are a plurality of channels (29) and protrusions (30). The configuration of said extrusions (29) and protrusions (30) enable easy installation of said mounting(27) or said illumination assembly (28) into the annunciator, by matching and fitting shapes of the channels (29) and protrusions (30) of said mounting to a complementary channels and protrusions of the annunciator.

In a preferred embodiment, said illumination assembly is mounted within an annunciator comprises of the external printed circuit board. As can be seen in Fig. 6, the external printed circuit board is preferably comprises of the motherboard (40), the CPU board (41), the relay (42), the input/output (1/0) board (43) and arear board (44). The relay (42) is preferably a R-Relay. More particularly, the pair of the spring (19a and 19b) is connected with the motherboard (40) and to the power supply. The annunciator is extendable by adding the 1/0 board (43) to a desired amount depending on the need of a user.

In operation, a power is supplied to the external printed circuit board and to said illumination assembly causes the illuminator to illuminate and thereby resulting the message to be seen from the cover plate (16). Said illumination assembly requires small current (approximately 0.75 mA) in operation and hence reduces maintenance cost. In the case of failure of the illuminator, said printed circuit board (18) is replaceable and can be removed by lifting the bezel holder (24) to disengage the plurality of legs (26) from the plurality of apertures (28), and then removing the spring holder (20) by disengaging the plurality of studs (23) from the opening (36) of the guide slot (261). Said configuration can eliminate the utilization of any external tool in assembly, installation and dismantlement.

Although the present invention has been described with reference to specific embodiments, also shown in the appended figures, it will be apparent for those skilled in the art that many variations and modifications can be done within the scope of the invention as described in the specification and defined in the following claims.

Description of the reference numerals used in the accompanying drawings according to the present invention:

Reference Numerals	Description
11	Display assembly
12	Bezel
13	Display panel
14	Diffuser
15	Filter
16	Cover plate
17	Electrical connection means
18	Printed circuit board
181	Illuminator
19a and19b	Spring
20	Spring holder
21a and 21b	Hollow protruding tube
22	Platform of spring holder
23	Stud
24	Bezel holder
25	Head portion of bezel holder
26	Leg of bezel holder
261	Guide slot
27	mounting
28	Aperture of mounting
29	Channel of external surface of mounting
30	Protrusion
32	Indentation of bezel

33	Engaging portion of bezel
34	Second indentation of head portion of bezel holder
36	Opening of the guide slot
40	Motherboard
41	CPU
42	Relay
43	Input/Output (I/O) Board
44	Rear Board

Claims

I/We claim:

1. An illumination assembly, ~~comprising~~ comprised of a display assembly ~~(11)~~, a bezel holder ~~(24)~~ and a mounting wherein ~~characterized by~~:

the display assembly ~~(11)~~ ~~comprising~~ includes a bezel ~~(12)~~ enclosing a display panel, ~~(13);~~
an electrical connection means ~~(17)~~ comprising a printed circuit board ~~(18)~~, a pair of springs ~~(19a and 19b)~~ for contacting with positive and

negative terminals of said printed circuit board ~~(18)~~, and a spring ~~–~~holder ~~(20)~~ comprising a pair of hollow protruding tubes ~~(21a and 21b)~~ for holding the pair of springs ~~(19a and 19b);~~
wherein the ~~a~~ bezel holder ~~(24)~~ ~~having~~ includes a plurality of legs ~~(26)~~ for receiving the bezel ~~(12) and~~ the electrical connection means ~~(17)~~; and

wherein the ~~a~~ mounting ~~(27)~~ ~~having~~ includes a plurality of apertures ~~(28)~~ complementary to the pair of hollow protruding tubes ~~(21a and 21b)~~ and complementary to the plurality of legs ~~(26)~~ of the bezel holder ~~(24)~~ to receive and secure said bezel holder ~~(24) therewith in~~.

2. The ~~An~~ illumination assembly according to claim 1, wherein the display assembly ~~(11)~~ further comprises:

   a diffuser, ~~(14)~~; a filter, ~~(15)~~; and
   ~~a display panel (13)~~;
   a cover plate ~~(16)~~; ~~and~~
   wherein the diffuser ~~(14)~~, the filter ~~(15)~~, ~~the displaY. panel (13), and~~ the cover plate ~~(16)~~ and the display panel are held together by the bezel. ~~(12f~~

3. The ~~An~~ illumination assembly according to claim 2 , wherein the cover plate ~~(16)~~
   is transparent , coloured, or translucent.

4. The ~~An~~ illumination assembly according to claim 1, wherein the spring holder ~~(20)~~ further comprises a platform ~~(22)~~ having a plurality of studs ~~(23)~~ for engaging with the bezel holder ~~(24)~~.

5. The ~~An~~ illumination assembly according to claim ~~1~~ 4, wherein the bezel holder ~~(24)~~ further comprises a plurality of guide slots ~~(261)~~ for receiving the plurality of studs ~~(23)~~ of the spring holder ~~(20)~~.

6. The ~~An~~ illumination assembly according to claim 1, wherein the printed circuit
board ~~(18)~~ is preferably a light emitting diode (LED) printed circuit board.

7. The ~~An~~ illumination assembly according to claim 1, wherein the ~~said~~ mounting ~~(27)~~ is made from nylon.

Claims

I/We claim:

1. An illumination assembly comprised of a display assembly, a bezel holder and a mounting wherein:

the display assembly includes a bezel enclosing a display panel, an electrical connection means comprising a printed circuit board, a pair of springs for contacting with positive and negative terminals of said printed circuit board and a spring holder comprising a pair of hollow protruding tubes for holding the pair of springs;

wherein the bezel holder includes a plurality of legs for receiving the bezel and the electrical connection means; and

wherein the mounting includes a plurality of apertures complementary to the pair of hollow protruding tubes and complementary to the plurality of legs of the bezel holder to receive and secure said bezel holder.

2. The illumination assembly according to claim 1, wherein the display assembly further comprises a diffuser, a filter, and a cover plate;

wherein the diffuser, the filter, the cover plate and the display panel are held together by the bezel.

3. The illumination assembly according to claim 2, wherein the cover plate is transparent, coloured or translucent.

4. The illumination assembly according to claim 1, wherein the spring holder further comprises a platform having a plurality of studs for engaging with the bezel holder.

5. The illumination assembly according to claim 4, wherein the bezel holder further comprises a plurality of guide slots for receiving the plurality of studs of the spring holder.

6. The illumination assembly according to claim 1, wherein the printed circuit board is preferably a light emitting diode (LED) printed circuit board.

7. The illumination assembly according to claim 1, wherein the mounting is made from nylon.