INTELLECTUAL PROPERTY OFFICE OF SINGAPORE APPLICATION

HSP EL CLIP 16

BACKGROUND

[001a] Field of the Invention:

A plastic clip to provide from mechanical to electrical connection joint between an Electro Luminescent (EL) Panel to an EL Inverter.

[001b] Description of the Related Art:

An EL panel is a non – thermal generation of light resulting from the application of an electric field (positive and negative electric charges) to a substance. It is manufactured by printing Phosphor paste, Dielectric paste and Silver paste over ITO film that is less than 0.3mm thick. The electric field can be generated by using an EL inverter. EL inverter is an electronic device or circuitry that changes direct current (DC) to alternating current (AC).

Traditionally an electrical joint between the EL panel and EL inverter are done by using cables with pasting of electrical conductive copper tapes, conductive double sided tapes, soldering and Kapton tapes are involved. This method is very labor intensive which is not feasible during mass production of the EL panel. This connection method is also not robust as the person can easily pull off the cables.

SUMMARY

[002] The present disclosure describe a Top & Bottom plate to hold the cables and printed ITO film. Both plates to secure by snap feature when lock and able to achieve enough compression pressure to allow a circuit connection yet not cause damage to the printed circuit. This provide a robust electrical joint and also eliminate the time on the soldering & manual work to paste the tapes.

BRIEF DESCRIPTION OF THE DRAWINGS

[003] FIG. 1 is a block diagram of a complete EL system.

[004] FIG. 2a is a perspective inner view for the top plate.

[005] FIG. 2b is a perspective outer view for the top plate.

[006] FIG. 3a is a perspective inner view for the bottom plate.

[007] FIG. 3b is a perspective outer view for the bottom plate.

[008] FIG. 4 is a perspective inner view for the HSP EL CLIP 16.

[009] FIG. 5 is a perspective view of the 2 cables, half closed EL clip and printed ITO film (EL panel).

[010] FIG. 6 is a perspective view when the cables and printed ITO film is placed into the half closed EL clip.

[011] FIG. 7 is a perspective view when the cables, printed ITO film is intact in a fully closed EL clip.

[012] FIG. 8 is a detailed dimension drawing for the HSP EL CLIP 16 Top plate.

[013] FIG. 9 is a detailed dimension drawing for the HSP EL CLIP 16 Bottom plate.

DETAILED DESCRIPTION

[014] Referring now to the discussion that follows and also to the drawings in FIG 1-9, illustrative approaches to the disclose product and methods are shown in detail. Although the drawings represent some possible approaches, the drawings are not necessary to scale and certain feature may be exaggerated, removed, or partially sectioned to better illustrate and explain the present disclosure.

[015] FIG. 1 is a block diagram of a complete EL system. It represent the electrical connection system from the EL inverter to our HSP EL CLIP 16 and lastly to the EL panel. The EL panel consist of a printed EL circuity on an Indium Tin Oxide (ITO) film, a printed graphic overlay plastic film and a back insulator film laminated together to form it.

[016] FIG. 2-4 of the drawings show various views of the EL clip. The EL clip comprise of a top plate 26a & bottom plate 27a which is made of Acrylonitrile Butadiene Styrene (ABS) material by Injection Moulding Process.

[017] The top plate 26a consist of a ball catch recess 26b, a locator recess 26c, a snap locking system 26d and a 90 degree angle 26e for the cable bending.

[018] The bottom plate 27a consist of a ball catch joint 27b, a locator 27c, a snap recess locking system 27d, a printed ITO film recess 27e, two cables holder with a wire recess 27f and a wire insulator recess 27g.

[019] The top & bottom plate are hold together by ball catch system 26b and 27b. This system allows Top plate to have a "flipping" movement for ease of placing cable 28 and ITO film 29 on bottom plate. It also eliminate alignment issues when locking both plates to close position.

[020] The 90 degree cable bending design 26e on the top plate is to provide additional gripping on the cable to prevent user from detaching the cables from EL clip.

[021] The locator 27c and the printed ITO film recess 27e is to positioning & secure the printed ITO film. This is to minimize the misalignment between the cables and the printed silver traces. The locator acts as a stopper to prevent user to detach the EL panel from the EL clip. The locator also acts as a isolator to prevent the 2 cables from short circuit.

[022] The cable recess is to align the cables 28 with the printed silver traces on ITO film 29 for electrical conductivity. It have both the wire recess 27f diameter size and the wire insulator recess 27g diameter size.

[023] The snap locking system 26d & 27d provide a mechanical (compression) force creating an electrical connection between EL panel and EL inverter. This compression force ensure that the wires and printed silver trace have a good electrical contact while not damaging the printed silver trace. The snap feature also act as a warranty seal to prevent user from breaking open the EL clip. The snap feature will be broken when user force open the EL clip, warranty will be considered void.

[024] FIG. 5-7 explain the Standard Operation Procedure (SOP) steps for the assembly process. FIG. 5 shows the direction for installing the cables and printed ITO film (EL panel). FIG. 6 shows how the cables and printed ITO film been place. Take note for the printed silver traces to be facing downward with the contact to the wires. FIG. 7 is a complete system for the EL connection when the EL clip is close and locked.

[025] FIG. 8-9 are the detail dimension drawing for the Top & Bottom plate. It has the perspective view, inner view, side view and cross sectional view for our EL clip.

CLAIMS

[C01] A EL clip comprise of a top & bottom plate which is made of Acrylonitrile Butadiene Styrene (ABS) material by Injection Moulding Process.

[C02] The top & bottom plate of [C01] are secure together with ball catch system. It allow ease of assembly and eliminate alignment issues.

[C03] The top plate consist of a locator recess, a 90 degree angle for the cable bending, a ball catch joint and a snap locking system.

[C04] The bottom plate consist of a locator, a printed ITO film recess, 2 cables recess, a ball catch recess and a snap recess locking system.

[C05] The method of providing an electrical connection between EL panel and EL inverter by using mechanical (compression & snap locking system) force.

[C06] The snap locking system method prevent the user to break open the EL clip. Once user force open, it will be broken and consider warranty void.

[C07] The cable recess is to align with the printed silver traces for electrical connection.

[C08] The printed ITO film recess and the locator is to position the printed film to minimize the misalignment between the cables and the printed silver traces. The locator prevent user to detach the EL panel and also acts as a isolator to prevent short circuit of the 2 cables.

[C09] The 90 degree cable bending design on the top plate prevent user from detaching the cables from EL clip.