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(54) **ILLUMINATED EXHIBITION PANEL**

(57) The present invention describes an illuminated display panel provided with illumination by means of LEDs, the parts of which are assembled by means of adhesive attachments, avoiding the use of mechanical attachments. The panel comprises a methacrylate plate (1) having a top face, a bottom face, and a perimetral edge. The panel has a sheet (6) attached to the plate (1) with a front face (7), a rear face, and a twice-bent segment provided with a first sector (10), and a second sector (11). The panel additionally has LEDs (12) attached integrally to the front face (7) of the first sector (10), a cooling tape with two-sided adhesive and heat conduction capacity attached to the LEDs (12) and to the front face (7), and an adhesive tape for fixation for the attachment between the plate (1) and the sheet (6).

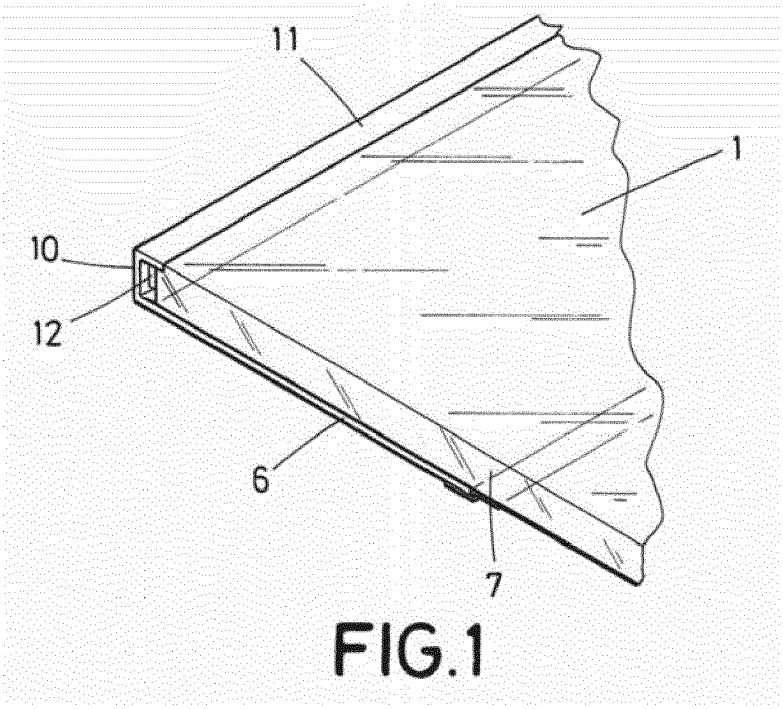

FIG.1

EP 3 654 321 A1

Description

OBJECT OF THE INVENTION

[0001] The present invention is comprised in the technical field of backlighting of products and images in commercial equipment and furniture, images on lighted sign boards, light boxes and backlighting in general. More specifically it relates to the field of illuminated sign boards which are illuminated on the edge with glowing parts, and it particularly relates to a display panel provided with illumination by means of LEDs, the parts of which are assembled exclusively by means of adhesive attachments, avoiding the use of mechanical attachments.

BACKGROUND OF THE INVENTION

[0002] In the advertising and marketing sector, display panels provided with illumination means to highlight an image adhered thereto are widely known and used. Said panels can be displayed by themselves or they can be part of the furniture, either in commercial settings or outdoors, as part of outdoor advertising.

[0003] These panels usually comprise illumination elements which project a light beam onto the surface of the panel in which the image to be shown is arranged. At present, said illumination elements are LED strips due to the advantages they have in terms of power consumption, flexibility, versatility, ease of installation and low heat generated.

[0004] However, despite the fact that, as mentioned, LED strips generate less heat than other illumination elements, said heat does have to be dissipated in order to prevent it from affecting the efficiency and useful life of the strip. Therefore, there is a need to provide these panels with heat sinks.

[0005] The most common heat sinks consist of metallic elements which transmit and release heat into the atmosphere, therefore the larger the surface area said sinks have, the more efficient they are. The problem of said sinks is that they add extra weight to the panel, and they can negatively affect the final appearance.

[0006] It is also common for the different elements forming panels of this type to be attached to one another by means of mechanical fastening elements, such as screws, nuts, nails or the like. These elements also add weight to the panel and furthermore have the additional negative effect arising from the production of flickering and reflections in those located near the light beam generated by the LEDs, proving an aesthetically imperfect result.

DESCRIPTION OF THE INVENTION

[0007] The object of the invention consists of an illuminated display panel the elements of which are attached to one another only by means of adhesive attachments, avoiding the use of mechanical fastening elements such as screws or the like, to thus overcome the problems set forth above.

[0008] To that end, the panel is formed by a base plate made of methacrylate, preferably PMMA (polymethyl methacrylate), with a thickness comprised in the range between 4 and 10 millimeters. This plate can incorporate a surface that is mechanically engraved, by means of a laser or screen printed. The option of using PMMA base plates formed with microlenses or microparticles is also contemplated.

[0009] A sheet, preferably made of aluminum, which partially covers a bottom face and a perimetral edge of the plate, is also attached to the methacrylate base plate in which the sign board or advertising element to be displayed is arranged. To that end, said sheet has a front face intended to face the bottom face of the plate, a rear face intended to face the outside, and a perpendicular twice-bent segment starting at the top of one of the perimetral edges thereof.

[0010] Inside said twice-bent portion an LED strip is arranged which emits a light beam towards the advertising element. To attach said a said strip to the metallic sheet, a cooling tape with two-sided adhesive and heat conduction capacity is preferably used to dissipate the heat generated by the LEDs by means of the transmission thereof to the sheet which, in turn, dissipates it by contact with the surrounding air.

[0011] The attachment between the methacrylate base plate and aluminum sheet is performed by means of an adhesive tape, which can be one-sided or two-sided. The option of incorporating adhesive reflective tape for reflecting and directing the light beams generated by the LEDs towards the area wherein the advertising element is arranged is also contemplated.

[0012] The panel thus described, made of lightweight and cost-effective materials, enables the flickering that usually occurs due to the screws present in the profile where the LED strip is fixed to be eliminated. It also favors a considerable reduction in production time, improvement of the final visual appearance of the product, and considerably reduces the dimensions of the edge of the panel not being used as an advertising site.

DESCRIPTION OF THE DRAWINGS

[0013] As a complement to the description provided herein, and for the purpose of helping to make the features of the invention more readily understandable, in accordance with a preferred practical exemplary embodiment thereof, said description is accompanied by a set of drawings which, by way of illustration and not limitation, represent the following:

Figure 1 shows a top perspective view of a detail of the display panel according to a first preferred embodiment.

Figure 2 shows a bottom perspective view of the panel of figure 1.

Figure 3 shows a front view of the panel of figure 1.
Figure 4 shows a top perspective view of a detail of the methacrylate plate.
Figure 5 shows a bottom perspective view of a detail of the display panel according to a second preferred embodiment.

PREFERRED EMBODIMENT OF THE INVENTION

[0014] A detailed explanation of a preferred exemplary embodiment of the object of the present invention is provided below with the help of the figures referred to above.
[0015] The illuminated display panel being described and schematically shown in figure 1, is formed first by a methacrylate plate (1) for supporting an advertising sign board, said plate (1) having a perimetral edge (2), a top face (3) through which the sign board is shown, and a bottom face (4) to which the sign board is attached. As illustrated in figure 4, the plate (1) also has a stepped recess (5) located on the perimetral edge (2).
[0016] In the preferred embodiment herein described, the plate (1) is made of PMMA (polymethyl methacrylate) and has a polygonal geometry.
[0017] An aluminum sheet (6) is attached to the plate (1), partially covering the bottom face (4) thereof and the perimetral edge (2). To that end, said sheet (6) has a front face (7) intended to face the bottom face (4) of the plate (1), a rear face (8) intended to face the outside, and a twice-bent segment (9) starting at the top from one of the perimetral edges thereof.
[0018] The twice-bent segment (9) in turn has a first sector (10) perpendicular to the sheet (6), and a second sector (11), starting perpendicularly from the first sector (10), parallel at the top to the front face (7) and intended to be fitted in the recess (5) of the plate (1).
[0019] LEDs (12), provided with the corresponding power supply connections, are integrally attached to the first sector (10) on the front face (7) thereof. Said attachment is performed by means of cooling tape (13), with two-sided adhesive and heat conduction capacity, for dissipating the heat generated by the LEDs (12) by means of transmitting it to the aluminum sheet (6).
[0020] The attachment between the plate (1) and the sheet (6) is ensured by means of adhesive tape (14) for fixation. In the embodiment herein described and shown in figures 1-3, said adhesive tape (14) is one-sided, whereas in the alternative embodiment illustrated in figure 5, the adhesive tape (14) is two-sided, so it is hidden from view.
[0021] Said attachment between the plate (1) and the sheet (6) generates a housing (15) limited by the perimetral edge (2) of the plate (1) and partially by the front face (7) of the twice-bent segment (9) and the sheet (6). The additional incorporation of adhesive reflective tape (16) for reflecting and directing the light beams generated by the LEDs (12) towards the top face (3) through which the advertising sign board is shown is contemplated.
[0022] In this preferred embodiment, the reflective tape (16) is located inside the housing (15), below the LEDs (12) and fastened to the front face (7) of sheet (6) near the first sector (10).

Claims

1. An illuminated display panel comprising:

- a methacrylate plate (1) for supporting an advertising sign board, having:
  - a top face (3) for observing the sign board,
  - a bottom face (4) for fastening the sign board, and
  - a perimetral edge (2) provided with a stepped recess (5),
- an aluminum sheet (6) attached to the plate (1), having:
  - a front face (7) for the partial covering of the bottom face (4) of the plate (1),
  - a rear face (8) intended to face the outside, and
  - a twice-bent segment (9) starting from a perimetral edge of the sheet (6), in turn having:
    - a first sector (10) perpendicular to the sheet (6) that can be facing the perimetral edge (2) of the plate (1), and
    - a second sector (11), starting perpendicularly from the first sector (10), parallel at the top to the front face (7) and able to be coupled in the recess (5) of the plate (1), and
      - LEDs (12) attached integrally to the front face (7) of the first sector (10) for generating and projecting a light beam on the sign board, the panel **characterized in that** it incorporates:
      - cooling tape (13), with two-sided adhesive and heat conduction capacity, attached to the LEDs (12) and to the front face (7) of the first sector (10), and
      - adhesive tape (14) for fixation for the attachment between the plate (1) and the sheet (6).

2. The illuminated panel according to claim 1, **characterized in that** it incorporates adhesive reflective tape (16) attached to the front face (7) of the sheet (6) for reflecting and directing the light beams generated by the LEDs (12).

3. The illuminated panel according to claim 1, **characterized in that** the adhesive tape (14) is two-sided tape.

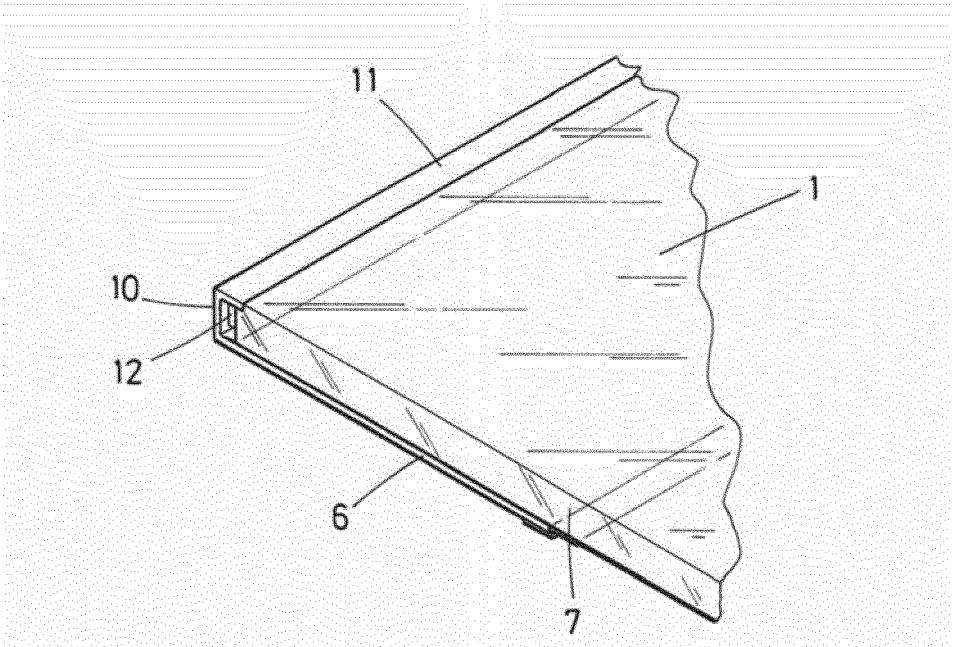

FIG.1

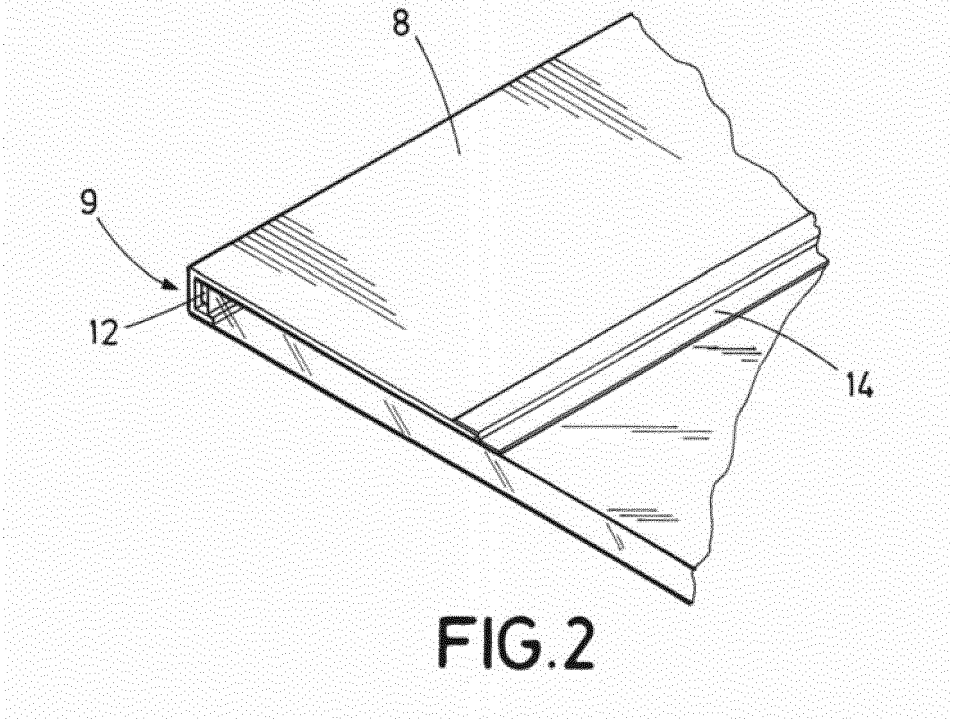

FIG.2

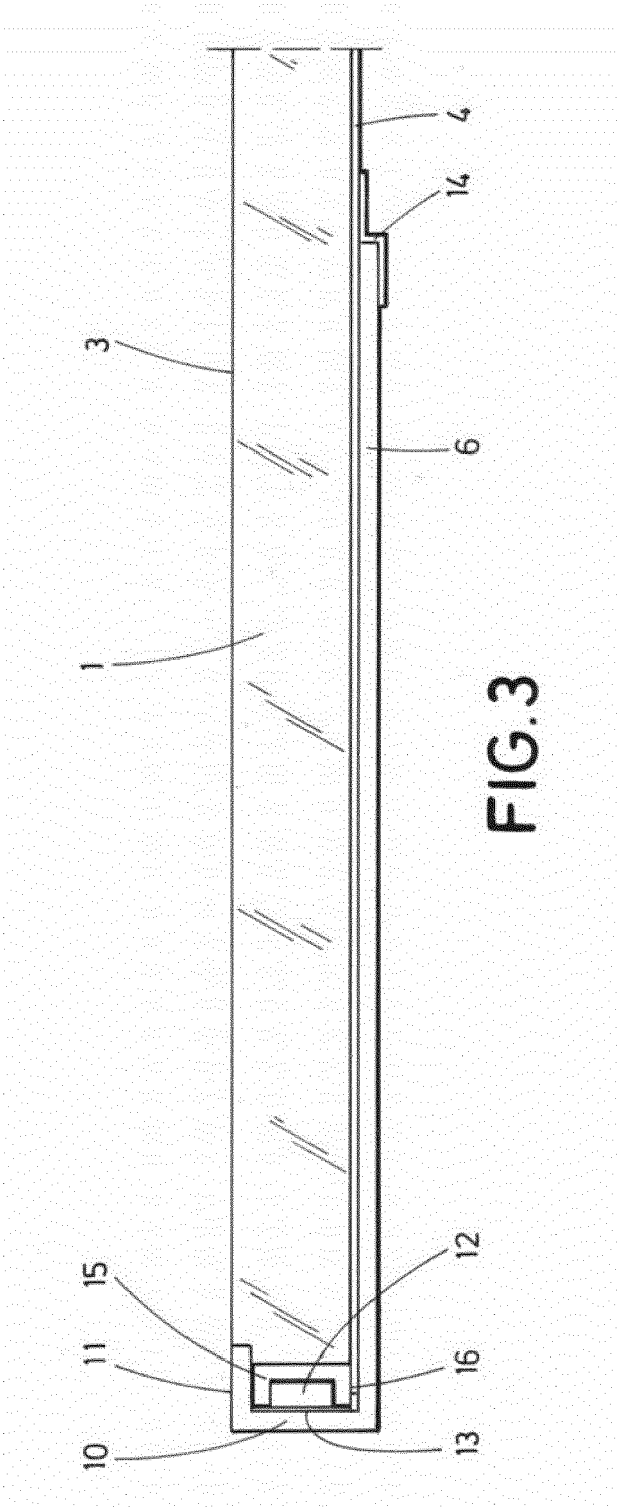

FIG.3

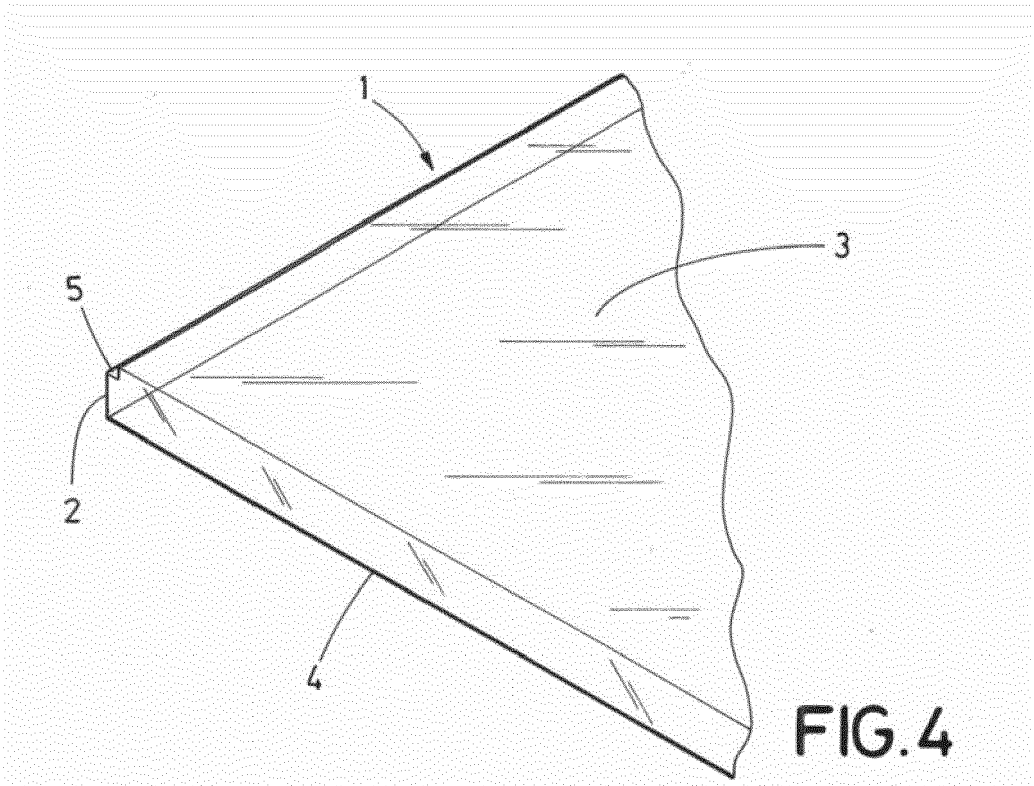

FIG.4

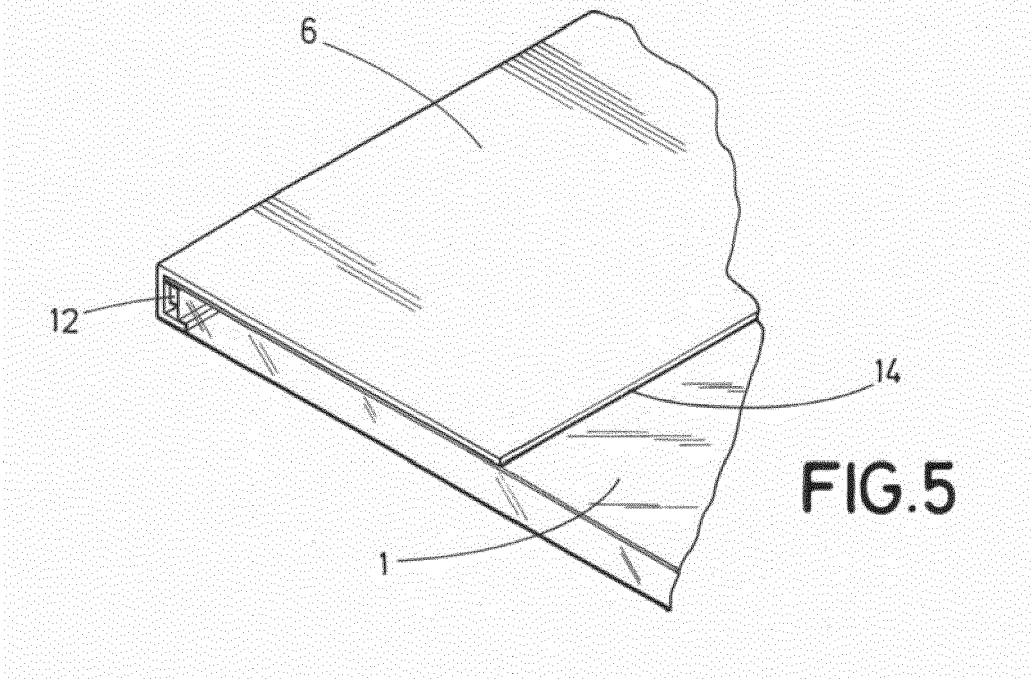

FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 19 38 2988

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 8 628 229 B1 (MC NEIL MALCOLM [US]) 14 January 2014 (2014-01-14) * column 1, lines 5-9 * * column 4, lines 10-51 * * column 5, lines 19-44 * * column 6, lines 36-63 * * figures 1-7 *	1-3	INV. G09F13/18 G09F13/22 G09F13/04
A	CN 203 338 702 U (SHANGHAI EDGE LIGHT IND CO LTD) 11 December 2013 (2013-12-11) * abstract; figures 1-2 *	1-3	
A	CN 101 290 429 A (CHI MEI OPTOELECTRONICS CO LTD [CN]) 22 October 2008 (2008-10-22) * abstract; figures 1-13 *	1-3	
A	JP 2009 245882 A (SANKEN ELECTRIC CO LTD) 22 October 2009 (2009-10-22) * abstract; figures 1-4 *	1-3	
			TECHNICAL FIELDS SEARCHED (IPC) G09F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	3 March 2020	Zanna, Argini

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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E : earlier patent document, but published on, or after the filing date
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 38 2988

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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03-03-2020

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82