

OPINION UNDER SECTION 74A

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| Patent | EP 1780584 B1 |
| Proprietor(s) | GV Lightec CO., LTD |
| Exclusive Licensee | Applelec Sign Components (UK) Limited |
| Requester | Tandem Patents Limited |
| Observer(s) | Applelec Sign Components (UK) Limited |
| Date Opinion issued | 14 April 2022 |

The request

1. The comptroller has been requested to issue an opinion as to whether a product could potentially infringe claim 1 of the EP(UK) patent EP1780584 B1 granted on 8th July 2009 ('the patent').
2. The only evidence provided of the particular product is the limited description and schematic drawings that are provided in the request. The requestor argues that the product would not infringe the patent.

Observations

3. Observations were received from the exclusive Licensee in the UK, Applelec Sign Components (UK) Limited.
4. No observations in reply were received.

The Patent EP 1780584 B1

5. The invention is a back-light panel comprising a sheet-like light guide fed near an edge by LED light emitters, the sheet having features to then scatter or direct this light out of the sheet from the face of the sheet. The back-light panel may be used to illuminate one face of a static or a moving display, the face of panel held adjacent a face of the display. Some of the advantages of the invention are said to be its ease of being formed as a curved panel, and its low profile due to the electrical components being accommodated within the thickness of the panel. There are many variations of the panel shown in the embodiments; I have selected two of these to reproduce here.

6. Figure 2 below shows an exploded perspective diagram of one embodiment comprising a flat panel. The light guide sheet 10 has an array of v-shaped notches 11 on its face to help scatter light outwards of the sheet. The sheet also has a groove 13 to receive a heat radiating plate 50 and an array of LEDs 31 mounted to a thin strip shaped PCB 33 having a feed wire 35.

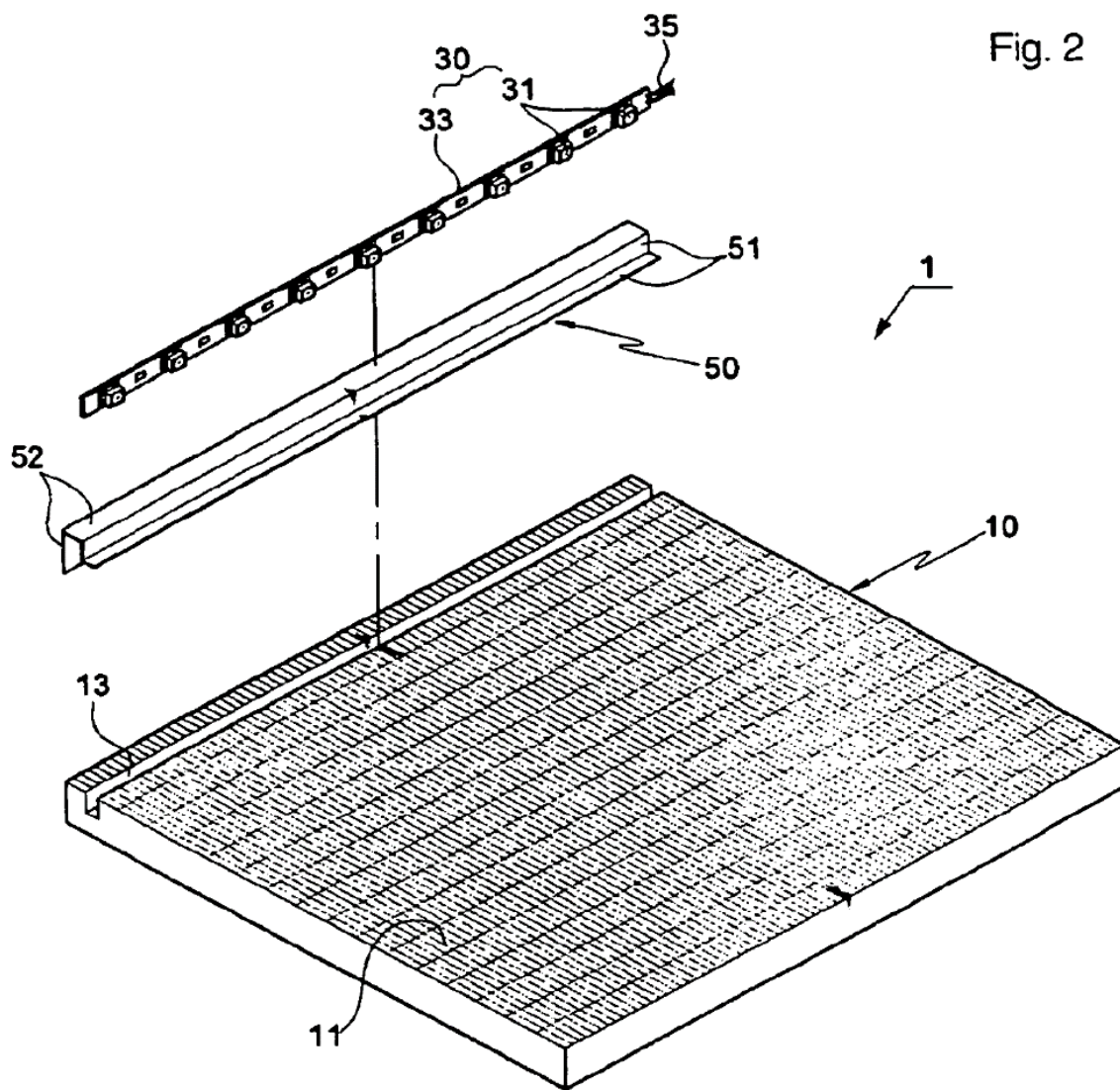
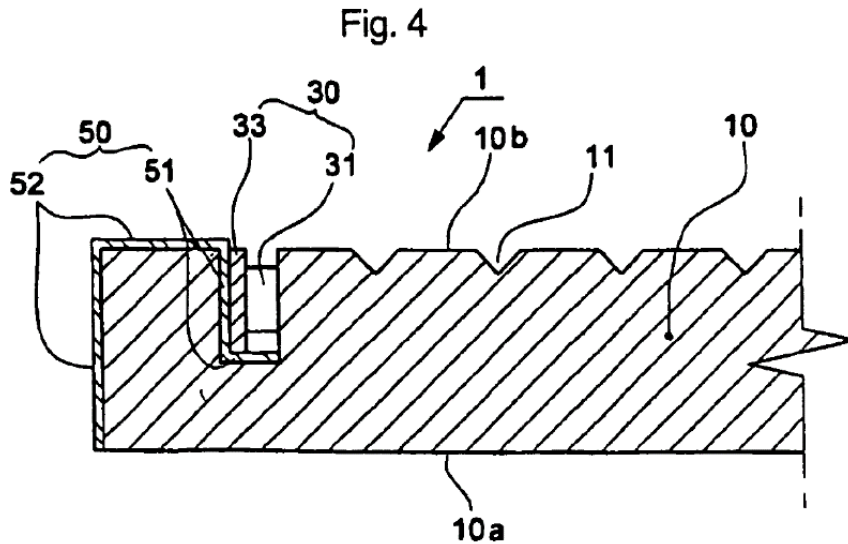


Fig. 2

7. The heat radiating plate 50 is said, in paragraph 23, to comprise two sections: A first 'groove-fitting' part (labelled 51 in figures 2, 4) inserted into the groove 13; And a second 'exposed' part outside of the groove (labelled 52 in figures 2, 4). When assembled and in use, the PCB strip of the LEDs contacts the part 51 of the heat radiation plate 50 which is fitted in the groove.
8. Figure 4 below shows a corresponding side view with detail of the groove area of figure 2 when the parts are assembled. It makes clear the locations of parts 51 and 52 when the heat radiating plate is in use. The plate is preferably integrally formed from a continuous aluminium metal sheet having a number of bends; In this embodiment, three bends.

9. It can be seen in figure 4 how the LEDs 31 directly face one inner wall of the groove. The 'groove fitting part 51' here forms an L-shape with a portion along the bottom of the groove connected to a portion against the opposite inner wall of the groove. This latter portion of 51 contacts the rear face of the PCB 33 opposite to the face with the LEDs 31. The 'exposed part 52' extends outwards from the groove in an inverted L-shape, with a portion over the top outer surface of plate 10 and a portion along the outer edge of the plate.



10. Paragraphs 22 and 23 describe the heat radiating plate in more detail saying that the exposed part 52 is:

'exposed to the outer surface of the light guide panel 10, is formed on one surface of the thin heat radiating plate 50, or two or three surfaces of the thin heat radiating plate 50 which is bent and extends to a predetermined position.'

and that:

'Preferably, each of the groove fitting part 51 and the exposed part 52 is formed on two or more surfaces so as to maximize the heat absorbing area and the heat emitting area.'

11. Figures 5a to 5g of the patent show many variations of the shape of portions 51 and 52 of the heat radiating plate. I reproduce 5a below which shows the plate 50 as a single L-shape, with one portion in the groove and the other portion extending over the top of the groove and along the outer surface of the plate.

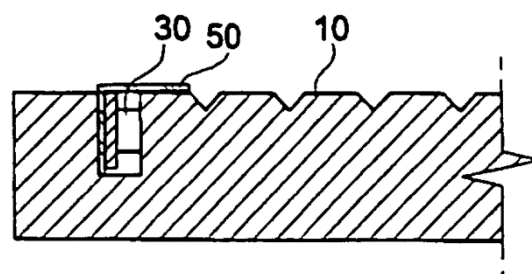
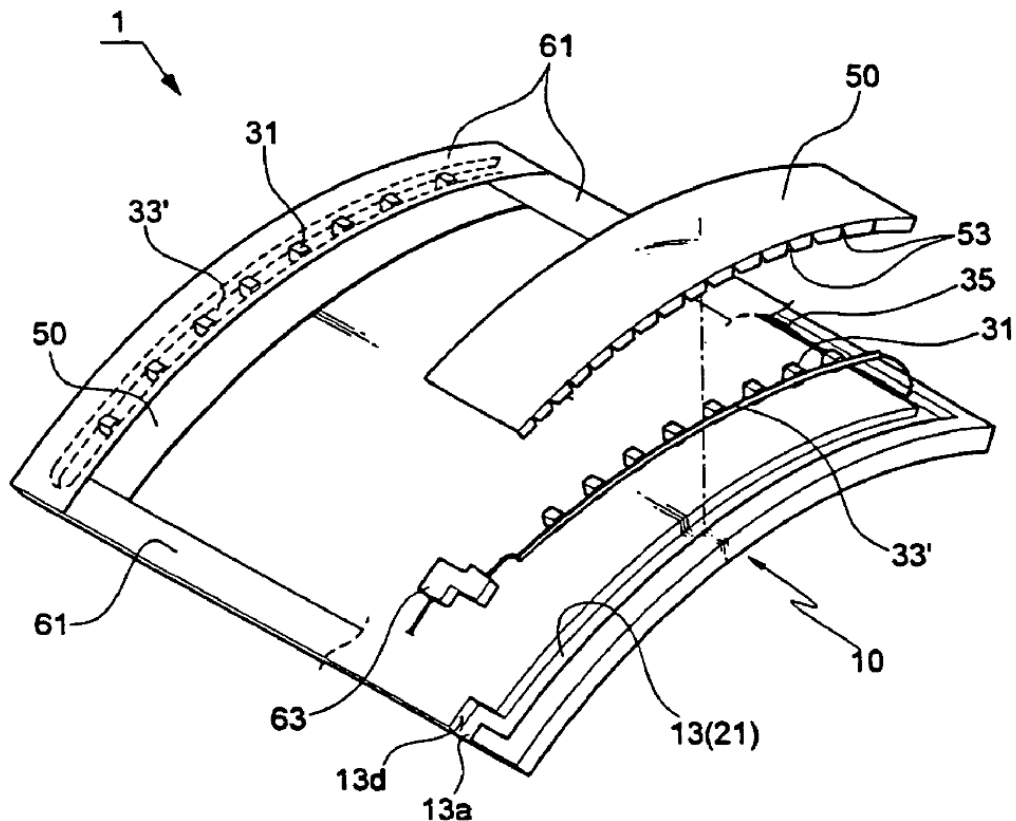


Fig. 5a

12. There are a number of variations of the light guide panel shown in the other figures of the patent, and for each of them it can be seen that the plate 50 has a first portion in the groove and a second portion outside the groove. This second exposed portion is not always labelled as such. The heat radiating plate is provided as a 'thin plate' helping with achieving curved shapes and the overall low profile of the backlight.
13. Figure 17 below is a further such example where the panel is curved rather than flat. It has two grooves rather than one, each with a strip of LEDs 31 on a correspondingly curved PCB 33. The grooves are at opposite ends of the panel. In the figure the right hand side shows an exploded view, while the left hand side is an assembled view with portions of reflective tape 61 applied on top.

Fig. 17



14. This figure shows the heat radiating plate in a shape similar to figure 5a above, where the external portion extends over the groove towards the middle of the plate. The notched edge 53 is inserted into the groove next to the PCB 33'; The notches allow the plate 50 to be more easily contoured to match the curved panel.

Claim construction

15. Before I can consider whether the patent could be infringed, I must first construe the claims. This means I must interpret the claims in the light of the description and drawings as instructed by Section 125(1) and I must also take account of the Protocol on the Interpretation of Article 69 of the European Patent Convention (EPC) as required by section 125(3). In doing so I must interpret the claims in context through the eyes of the person skilled in the art. Simply put, I must give the claims a

“purposive” (or “normal”) interpretation¹ by asking what the person skilled in the art would have understood the language of the claim used by the patentee to mean.

16. Section 125(1) of the Act states that:

For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.

and the Protocol on the Interpretation of Article 69 of the EPC (which corresponds to section 125(1)) states that:

Article 69 should not be interpreted in the sense that the extent of the protection conferred by a European patent is to be understood as that defined by the strict, literal meaning of the wording used in the claims, the description and drawings being employed only for the purpose of resolving an ambiguity found in the claims. Neither should it be interpreted in the sense that the claims serve only as a guideline and that the actual protection conferred may extend to what, from a consideration of the description and drawings by a person skilled in the art, the patentee has contemplated. On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties.

17. Claim 1 reads as follows (I have included the additional formatting used by the requestor in bold and I have also included the figure reference numbers as used in the granted B1 publication):

a). 1. A backlight unit (1), comprising:

i. a light guide panel (10) which includes a light guide plate having on a front or back surface (10a,10b) thereof a plurality of notches (11), an uneven dot pattern, a printed dot pattern or a sanded surface, or a light diffusion plate;

ii. at least one luminous means (30), each of which includes light emitting diodes (31) mounted on a front surface of a printed circuit board (33);

iii. and a groove (13) having two sidewalls and arranged along a portion of the periphery of the front or back surface (10a,10b) of the light guide plate, characterized in that

b).

i. the luminous means (30) and

¹ In *Generics UK Ltd (t/a Mylan) v Yeda* [2017] EWHC 2629 (Pat), Arnold J (as he then was) confirmed (at [134]-[138]) the continuing requirement to interpret patent specifications purposively, having considered the earlier judgment of the UK Supreme Court in *Actavis v Eli Lilly* [2017] UKSC 48. Arnold J's conclusion was approved by Lord Kitchin in *Icescape Ltd v. Ice-World International BV* [2018] EHC Civ 2219 (at [60]).

ii. a part (51) of a thin heat radiating plate (50) are fitted between the two sidewalls of the groove (13)

c). with the heat radiating plate (50) and a back surface of the printed circuit board (33) being in direct contact with each other, and

d). the light emitting diodes (31) being in direct contact with one sidewall of the groove (13).

18. The request states that part **b) ii.** of claim 1 is unclear and discusses how it should be construed. The observations from Applelec do not seem to address this argument on interpretation of the claim.

19. Firstly, the requestor argues that the words '*thin heat radiating plate*' should be construed as meaning less than 1mm thick. They partly base this on the discussion of the prior art in the patent at paragraph 12. I note that the prior art arrangement discussed is a slightly different two part assembly (shown in figure 1b), the relevant part of that paragraph says:

'Since the bracket and the heat radiating plate were manufactured through aluminum extrusion, they had considerable thickness of about 1mm at least, so the bracket and the heat radiating plate were not easily bent.'

They also base their argument on paragraph 25 that says:

'When the thin heat radiating plate 50, that is, the thin aluminum plate, is formed to have a thickness from 0.2mm to 0.4mm, the thin heat radiating plate 50 is easily bent, and a step protruding from the surface of the light guide panel is very small, so that it is not necessary to compensate for the step'

20. I agree that '*thin*' is not clearly defined by claim 1. Nor do any of the dependant claims help much; I note claim 4 does require the plate be '*an aluminum material*', and that it '*...is bent at least once...*'. There is no thickness range defined in the claim set. The description repeatedly states that the heat radiating plate of the embodiment is '*easily bent*', but there is very little specifying thickness other than paragraph 25 quoted above. I note that the description gives advantages of the invention, including that of paragraph 73:

'Second, the present invention provides a backlight unit, in which a heat radiating plate comprises a thin plate, so that it is convenient to deal with the case where a light guide panel or a PCB is installed in a curved shape, and it is not necessary to compensate for a surface step.'

21. I consider that '*thin heat radiating plate*' is not limited to being less than 1mm or limited to the 0.2-0.4 mm range. Neither is it limited to being aluminium, nor must it be thin enough to be '*easily bendable*' as claim 4 requires. The thinness would depend partly on the heatsinking needed according to the heat produced from the LEDs chosen and partly on the size of the backlight being constructed. A requirement clearly stated by claim 1 is that the groove be sufficiently sized to fit both the plate and PCB carrying the LEDs; There is very little else in claim 1 helping to

define the scope of 'thin'. Therefore I disagree with the narrow construction of the request. The term 'thin' should be construed more broadly than the request argues.

22. Secondly, the requestor argues that 'part of' in the phrase '*a part of a thin heat radiating plate*' implies that less than the whole of the heat radiating plate is fitted inside the groove. They also say that paragraphs 23 to 24 explain that an external part 52 of the plate, seen in figures 4 and 5a to 5g, acts to emit heat from inside the groove to outside the groove. I agree that part b) ii. of the claim is ambiguous.
23. I think the skilled reader would pay attention to the fact that the phrase '*a part (51) of*' is present and will also pay attention to the figure reference labels used, with the claim using '*a part (51)*' and '*plate (50)*'. I do not think it therefore reasonable that the skilled reader would conclude that this means the whole of the plate 50 is to be placed in the groove. The use of label 51 will suggest to the skilled reader that they should pay some attention to the description and figures where 51 is used and they would note that it is used along with label 52 that refers to the exposed part.
24. Again, I note dependent claim 4, which in full says:

4. The backlight unit according to claim 1, wherein the heat radiating plate (50) is made of an aluminum material, and wherein the heat radiating plate (50) is bent at least once, so that the said part (51) of the heat radiating plate (50) is fitted into the groove (13) and the remaining part (52) of the heat radiating plate (50) is arranged on the outside of the light guide panel (10).

The skilled reader would understand that this claim is intended to describe optional features. While the claim states a part is outside of the panel and thus the groove, this reference is used to describe the method of bending aluminium to form the parts 51 and 52. I do not think claim 4 implies that '*the remaining part (52)*' is a newly presented feature not present in claim 1, instead this dependant claim is more likely read as implying this part 52 is a feature already present in the invention of the previous referenced claims.

25. I think that the skilled reader would take a purposive view of the term '*heat radiating plate*' and expect it to function to radiate heat away from the PCB and LEDs. As I mention above, when discussing the plate in paragraph 23, it is said the part 52 is exposed from the groove and it is clear to the reader that 51 acts to absorb heat, while 52 acts to emit heat. Thus, the skilled reader would understand that the way for the plate to have a heat radiating function, the way used in every embodiment, is for it to have an exposed part external to the groove.
26. It is my opinion that, on the balance of probabilities, claim 1 implicitly requires the heat radiating plate to have a second part located external to the groove.

Infringement

27. Section 60 of the Act governs what constitutes infringement of a patent, the relevant parts of this section read as follows:

(1) Subject to the provision of this section, a person infringes a patent for an

invention if, but only if, while the patent is in force, he does any of the following things in the United Kingdom in relation to the invention without the consent of the proprietor of the patent, that is to say -

(a) where the invention is a product, he makes, disposes of, offers to dispose of, uses or imports the product or keeps it whether for disposal or otherwise;

(b) where the invention is a process, he uses the process or he offers it for use in the United Kingdom when he knows, or it is obvious to a reasonable person in the circumstances, that its use there without the consent of the proprietor would be an infringement of the patent;

(c) where the invention is a process, he disposes of, offers to dispose of, uses or imports any product obtained directly by means of that process or keeps any such product whether for disposal or otherwise.

(2) Subject to the following provisions of this section, a person (other than the proprietor of the patent) also infringes a patent for an invention if while the patent is in force and without the consent of the proprietor, he supplies or offers to supply in the United Kingdom a person other than a licensee or other person entitled to work the invention with any of the means, relating to an essential element of the invention, for putting the invention into effect when he knows, or it is obvious to a reasonable person in the circumstances, that those means are suitable for putting, and are intended to put, the invention into effect in the United Kingdom.

28. In the Supreme Court in *Actavis v Eli Lilly*² Lord Neuberger stated that the problem of infringement is best approached by addressing two issues, each of which is to be considered through the eyes of the notional addressee of the patent in suit, i.e. the person skilled in the relevant art. Those issues are:

(i) does the variant infringe any of the claims as a matter of normal interpretation; and, if not,

(ii) does the variant nonetheless infringe because it varies from the invention in a way or ways which is or are immaterial?

If the answer to either issue is “yes”, there is infringement; otherwise there is not.

29. The Supreme Court in *Actavis* provided a reformulation of the three questions in *Improver*³ to provide assistance in determining whether a variant infringes or not. These reformulated questions are:

(i) Notwithstanding that it is not within the literal meaning of the relevant claim(s) of the patent, does the variant achieve substantially the same result in substantially the same way as the invention, i.e. the inventive concept

² *Actavis UK Limited and others v Eli Lilly and Company* [2017] UKSC 48

³ *Improver Corporation v Remington Consumer Products Ltd* [1990] FSR 181

revealed by the patent?

(ii) Would it be obvious to the person skilled in the art, reading the patent at the priority date, but knowing the variant achieves substantially the same result as the invention, that it does so substantially the same way as the invention?

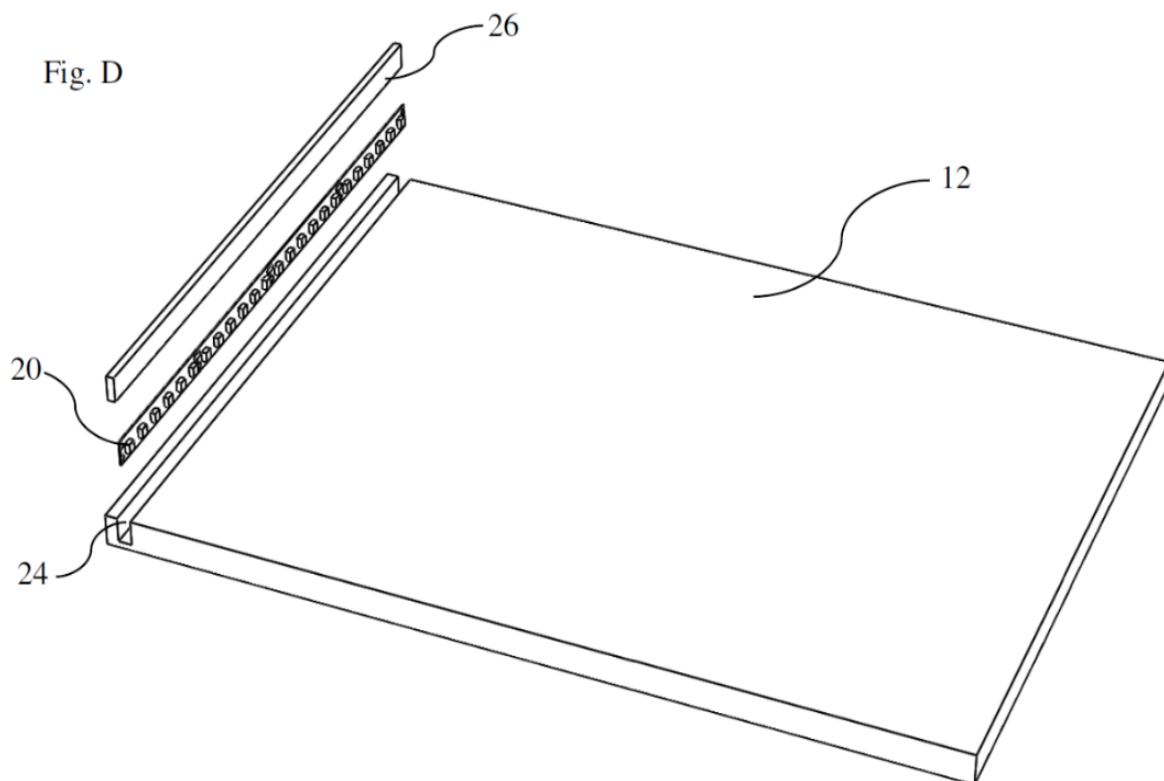
(iii) Would such a reader of the patent have concluded that the patentee nonetheless intended that strict compliance with the literal meaning of the relevant claim(s) of the patent was an essential requirement of the invention?

In order to establish infringement in a case where there is no literal infringement, a patentee would have to establish that the answer to the first two questions was “yes” and that the answer to the third question was “no”.

30. As the request is regarding a potential infringing product, I do not need to consider if any infringing acts have occurred.

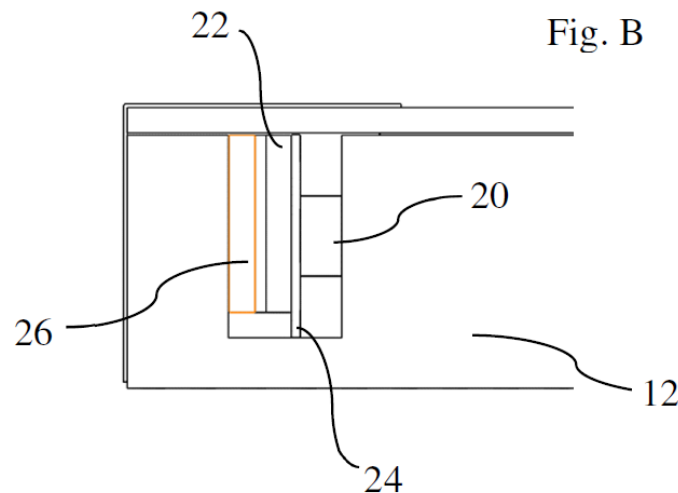
The Proposed Product

31. The request describes a proposed product that is argued would not infringe claim 1. The product is a similar back-light panel with a groove towards one edge receiving LED lamps.
32. Figure D below shows an exploded perspective diagram with groove 24 in the panel 12 receiving LEDs 20 and a ‘metallic packer’ 26. The packer is said to be between 1mm and 2.5mm thick.



Not shown are the surface features for scattering/redirecting light out of the panel (seen in figures A and C of the request).

33. Figure B below shows a corresponding cross-section of the groove 24 with the assembled parts inside. LEDs 20 are mounted to one side of PCB 22 and the packer 26 is arranged to contact the opposite side of the PCB.



34. The request admits that the product would have all of the features of claim 1, except feature **b) ii**. There appears to be no dispute on the product having at least the other features of claim 1. They state that feature b) ii is not part of the product on the basis of two distinguishing features : Firstly, the packer, LEDs and PCB are wholly contained within the groove; Secondly, the packer is relatively thick compared to the plate of the patent.
35. The Licensee, Applelec, state that a principle of the patent is to protect the lifespan of the lamp by having the heat radiating plate. They say the purpose of the plate is to protect the LED's life and that '*...any alternative presumption arguably forgets this 'life' / longevity point of the LED or lamp being attached to a 'heat radiating plate' as a central feature of this invention.*' .
36. Considering the thickness aspect, I do not think the plate of the claim is limited to any specific thickness measurement. I am not told what the other dimensions of the packer are expected to be, which makes it difficult to decide if the packer might more resemble a thick plate rather than a thin plate. I am only shown the diagrams, which I interpret as a schematic rather than to scale. It is not clear to me that I am shown a thick plate. It is my opinion that the stated thickness range of the metallic packer 26 is not distinguished from the requirement in claim 1 for a '*thin*' plate. There is no discussion of this point by the Licensee.
37. As I argue above, I think the invention of claim 1 implicitly requires a heat radiating plate with both a part in the groove and a part external to the groove. Thus, as the metallic packer is completely contained within the volume of the groove, the product lacks such a required external part and is distinct from the invention of claim 1.
38. Thus, as a matter of normal interpretation, it is my opinion that the product would not infringe claim 1.

39. I now need to consider if the product might still infringe by being an immaterial variant of the invention. The variant aspect to consider is the omission of the external part of the heat radiating plate, such that the plate is only located inside the groove.
40. The first question to answer is, does the variant achieve substantially the same result in substantively the same way? I think the packer does contact the inner groove wall and contact the LED PCB in the same way as the embodiments of the patent show. The packer will provide a thermal connection between the LEDs on the PCB and the thermal mass of the packer and thus it will act as a heat-sink for the LEDs in substantially the same way. It would likely be evident to the skilled person inspecting the product that heat would probably be more evenly spread across the PCB and they would expect temperature of the LEDs of the product in use will at least rise more slowly compared to having no packer present. Thus, the packer would provide some degree of thermal protection the LEDs. So, I do think that the purpose of the packer is broadly the same as the plate, to protect the LEDs from overheating in use.
41. What is less clear, is the extent to which the packer is then able to radiate away its heat compared to the plate of the invention. I think the omission of a part external to the groove, means the packer is likely to be less able to radiate heat away compared to the claimed plate as the packer is far more confined within the panel. In other words, the skilled person would think that the packer would not work as well as the claimed '*radiating plate*' to radiate heat away.
42. I note the Licensee states: '*One principle of this patent is to protect an LED whose life would be severely reduced if the heat generated by the LED wasn't dissipated away ...*'. I think the way heat is dissipated away is significantly different for a plate only contained in the groove compared to a plate with part outside the groove. Thus, I think the packer also protects the LEDs, but does so in a way that is different to the plate of the claim.
43. Thus, on the balance of probabilities, I am of the opinion that the variant will not achieve substantially the same result in the same way as it will have restricted ability to radiate heat away. Given my finding that the first of the reformulated *Improver* questions is a 'no', I do not need to consider the second and third questions.

Conclusion

44. It is my opinion, given the evidence available, that claim 1 would not be infringed by the proposed product were it made, disposed of, used, sold or imported in the UK.

Application for review

45. Under section 74B and rule 98, the proprietor may, within three months of the date of issue of this opinion, apply to the comptroller for a review of the opinion.

Gareth Lewis
Examiner

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.