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**Datasheet for the decision
of 6 November 2025**

Case Number: T 0541/24 - 3.4.01

Application Number: 18762766.6

Publication Number: 3665495

IPC: G01S7/481, C03C3/087, C03C3/04,
C03C4/00

Language of the proceedings: EN

Title of invention:
PROTECTIVE HOUSING FOR A SENSING DEVICE

Applicant:
AGC Glass Europe

Headword:
Protective housing with a cover lens for a LiDAR device / AGC
Glass Europe

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 12(3), 13(2)

Keyword:
Inventive step - problem and solution approach
Late-filed request - admitted (yes)
Exceptional circumstances (yes)



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Case Number: T 0541/24 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 6 November 2025

Appellant: AGC Glass Europe
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 11 December
2023 refusing European patent application No.
18762766.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman P. Scriven
Members: P. Fontenay
L. Bühler

Summary of Facts and Submissions

- I. The appeal is of the Examining Division's refusal of the patent application.

- II. The application was refused because the subject-matter of claims 1 and 9 of the applicant's sole request did not involve an inventive step, within the meaning of Article 56 EPC.

- III. The Examining Division held that it would have been obvious to adapt the device disclosed in document

D7: US-A-2016-223663,

in the light of document

D2: WO-A-2016/202689.

- IV. Concretely, the Examining Division relied on the finding that the glass sheet of D2, which reproduced the recited composition of the glass sheet in claim 1, had a high transparency for the radiation emitted and received by LiDAR devices. Even though D2 did not disclose the use of the glass sheet for such detection devices, the Examining Division held that it would have been a normal option for the skilled person to use it in the context of D7, which disclosed a detection device comprising a LiDAR sensing device with its protective housing and cover lens.

- V. According to an alternative approach, the Examining Division further observed, with reference to the guidelines for examination, that the invention consisted merely in a new use of the glass material known from D2, taking advantage of its known properties.
- VI. The applicant appealed the decision and requested that it be set aside.
- VII. In substance, the applicant objected to the decision regarding the lack of an inventive step on two grounds. It was underlined, firstly, that the person skilled in the art, looking for an adequate material for the cover lens of D7, would not have considered document D2, which was concerned with glass sheets for touch panels or touchpads. Secondly, the combination of D2 and D7 did not lead to the claimed invention because the glass composition disclosed in D2 contained selenium, an element known to have a significant absorption in the wavelength range 750 nm to 1050 nm, which made it inappropriate for a use with LiDAR devices. This view was corroborated by two declarations annexed to the statement of grounds, written, respectively, by Ms A. Dogimont, one of the inventors of the invention disclosed in D2 (document A) and Mr. Y. Sartenaer, one of the inventors of the present invention (document B).
- VIII. In a communication under to Article 15(1) RPBA, the Board issued its preliminary opinion on the case. In essence, the Board shared the Examining Division's view that document D7 constituted a suitable starting point for deciding on the inventive merits of the

claimed invention. It remained, thus, to be established whether the skilled person would have recognised that glass materials used in the field of touchpads or touch panels, as disclosed in D2, might also be suitable for LiDAR devices. The Board was not persuaded by the alleged fact that the glass sheets of D2 exhibited non-negligible absorption properties in the infrared domain.

- IX. The alternative approach, relied upon by the Examining Division based on the finding that the invention related to the new use of the material disclosed in D2 was also not considered persuasive.

- X. Document D8: WO-A-2018/015312 was introduced *ex officio* by the Board and was considered to anticipate the subject-matter of claim 9, as to the use of a cover lens. D8 is part of the prior art in the sense of Article 54(3) EPC.

- XI. In its response to the Board's preliminary opinion, the appellant objected to the Board's novelty objection to claim 9. With regard to claim 1 and inventive step, the applicant reiterated the view that D2 did not relate to LiDAR applications and would not have been considered by the skilled person for that reason. Emphasis was again put on the fact that the use of selenium in the glass layers disclosed in D2 rendered the material unsuitable for applications requiring high transparency in the infrared domain. It was stressed, in this respect, that document A referred to the absorption resulting solely from the presence of selenium in the glass, but that the glass materials of D2 contained

other elements which, in effect, contributed to a substantially higher infrared absorption than recited in claim 1.

XII. New auxiliary requests 1 and 2 were filed. Auxiliary request 1 differs from the main request in that claim 9 has been deleted. Auxiliary request 2 differs from auxiliary request 1 in that claim 1 has been amended so as further to include the features of dependent claim 4 of the main request and in that dependent claims have been renumbered accordingly.

XIII. The applicant further developed their view that D2 would not have been considered by the skilled person. Although D2 was concerned with the problem of transparency in glass materials, it was argued that it relied on a totally different technology. In D2, the infrared (IR) radiation was meant to propagate mainly inside the sheet of glass, thus travelling in the body of the glass sheet between its two main faces. In contrast, the claimed invention referred to the transmission of IR radiation through the opposite surfaces of the glass layer defining the cover lens. Both the nature of the objects disclosed in D2 (touchpads and touchscreens) and the technology involved made it unlikely that the skilled person would have ever considered the materials disclosed in D2 for the cover lens of the LiDAR device of D7. The applicant further elaborated on the consequences resulting from the presence of selenium in the glass materials disclosed in D2, which rendered them inappropriate for IR transmission. It was observed, in this respect, that the explicit reference in the patent application to document D2 and to the glasses disclosed therein as

being appropriate for the claimed device was misleading.

XIV. Claim 1 of the main request reads:

A detection device comprising:

- a. a LiDAR sensing device;*
- b. a protective housing enclosing said LiDAR sensing device, and comprising at least one cover lens;*

characterized in that, at least a portion of the cover lens is made of at least one glass sheet having an absorption coefficient lower than 5 m^{-1} in the wavelength range from 750 to 1650nm, preferably in the range of 750 to 1050nm, more preferably in the range of 750 to 950nm

and in that said glass sheet comprises a content, expressed as the total weight of glass percentages of:

<i>SiO₂</i>	<i>55 - 85%</i>
<i>Al₂O₃</i>	<i>0 - 30%</i>
<i>B₂O₃</i>	<i>0 - 20%</i>
<i>Na₂O</i>	<i>0 - 25%</i>
<i>CaO</i>	<i>0 - 20%</i>
<i>MgO</i>	<i>0 - 15%</i>
<i>K₂O</i>	<i>0 - 20%</i>
<i>BaO</i>	<i>0 - 20%</i>
<i>Total iron</i>	<i>0.002 - 0.06%</i>
<i>(expressed as</i>	
<i>Fe₂O₃)</i>	
<i>Cr₂O₃</i>	<i>0.0001 - 0.06%.</i>

Reasons for the Decision

Main request - inventive step

1. Both the applicant and the Board concur with the Examining Division that D7 constitutes a suitable starting point for assessing inventive step. D7 relates to the field of the invention and shares a plurality of structural features with the claimed invention. Specifically, the arrangement of D7 discloses a detection device comprising a LiDAR sensing device (paragraph [0003]) enclosed in a protective housing. The window element 220 that closes the aperture 210 inside the protective housing of D7 constitutes a cover lens in the sense of present application, as set forth in claim 1 (paragraphs [0030], [0032] - [0034], Figure 2).
2. The claimed detection device differs from the LiDAR detection device of D7 by the characterising features of claim 1. These correspond to the absorption properties and the composition of the glass sheet within the cover lens.
3. The objective problem solved by the invention is to provide a suitable material for the cover lens that is transparent in the relevant infrared domain and that provides adequate mechanical properties in terms of resistance and durability (page 1, lines 2-8, page 3, lines 4-14, page 19, line 11 - page 20, line 1). Specifically, this amounts to finding a material having an absorption coefficient lower than 5 m^{-1} in the wavelength range extending between 750 nm and 1650 nm and providing sufficient protection against external degradation and high durability.

4. Faced with the above objective problem, the skilled person would have searched for suitable materials, transparent to the IR radiation used in LiDARs and resistant to outdoor conditions. This implies, under the circumstances, that said search would not have been limited by either the object of the invention (glass layers for the cover lens of LiDAR devices) or the way infrared radiation within the glass material is transmitted. This follows from the definition of the objective problem which is not limited by either of these two aspects. Concretely, the skilled person would thus have considered fields in which materials are required that are highly transparent to IR radiation and, at the same time, sufficiently resistant and durable.

5. This is the case for a certain category of touch screens where the location of an object (finger or stylus) touching the glass layer creates some local perturbation of the IR radiation field present in it. The glass layer in such touch screens behaves like a waveguide for radiation emitted at the glass edges. As a result of the perturbation resulting from the presence of an object on the surface of the layer at the touch location, light is scattered in all directions, thus generating an infrared spot opposite the touch surface that is captured by corresponding detecting means.

6. Such touch screens are disclosed in D2, the teaching of which encompasses, more generally, uses requiring very good transmission of infrared radiation, independently of whether the transmission starts from the glass edge or from the main faces of the glass layer (page 3, lines 3-7; page 17, lines 1-5). The passage on page 23, lines 19-24, of D2 confirms that the glass panels of D2

may be used for purposes other than touchpads or touch screens.

7. Importantly, touchpads and touch screens are typically made of materials that can withstand repeated physical contact and frequent mechanical stress.
8. The skilled person would therefore have considered the teaching of D2, that discloses such materials, for their use as cover lenses in LiDAR devices.
9. The applicant underlined that the materials disclosed in D2 were not adapted for the recited use in combination with LiDAR devices. This applied, in particular, to the material disclosed on page 5, line 21 - page 6, line 5. It was specifically underlined, in this respect, that the material referred to, although it reproduces the material composition recited in claim 1, was not limited to these sole elements, but also included cobalt and selenium. The latter element is however known for its absorption properties in the infrared domain, as was confirmed by documents A and B. This constituted a clear indication that the skilled person, looking for a highly transparent material for IR radiation, would not have considered this glass material.
10. The argument is not persuasive.
11. Firstly, the argument is in contradiction with the statement on page 16, lines 6-8 of the published application, which explicitly refers to D2 and the suitable glass compositions described therein. This statement corroborates the previous indication, on page 15, line 6 - page 16, line 2, that such a composition reflected a fourth embodiment of the glass sheet

according to the present invention. It is further corroborated by the table of examples bridging pages 16 and 17.

12. Secondly, in contrast to the applicant's statement, that the reference, in the application, to document D2 was misleading in that said reference did not actually refer to suitable materials for the cover lens of the invention, various indications in the file wrapper appear to indicate that the presence of selenium in small amounts does not substantially prejudice the transmission of infrared radiation. D2 itself repeatedly stresses that the materials disclosed therein, which comprise selenium in their composition, maintain high transmission of infrared radiation (see page 18, lines 8-9 and line 20; page 19, lines 1-2 and lines 12-16; and the discussion of examples 1 to 14 on pages 28 to 32 (tables 1 to 4)).

13. Document B does not contradict this assessment. Mr Sartenaer's declaration contains no categorical assertion regarding the presence of selenium in the glass compositions of D2 but merely underlines the possibility that said presence "could lead to a decrease in IR transmission". Document A is more specific and contains graphs showing the absorption in the IR domain for two different selenium concentrations, namely for a concentration of 3 ppm and a concentration of 5000 ppm. These values correspond to the limits of the range of concentrations envisaged in D2. The graph regarding the absorption due to a concentration of 3 ppm shows a maximum of around $1,5 \text{ m}^{-1}$ at a wavelength of 750 nm. This is in line with the claimed property and does not render the glass material of D2 unsuitable for the recited use in LiDAR devices.

14. The applicant's argument that the graphs in document A relate to the contribution resulting solely from the presence of selenium in a glass material but that other elements in the material composition contributed to the total absorption in the material, was not sufficient to persuade the Board that a glass material containing selenium was not suitable. Firstly, this argument is not explicitly supported by document A, which simply refers, generally to document D2 and does not expound on the conditions of measurement that lead to the absorption properties illustrated in the various graphs. Secondly, even if it is assumed, in favour of the applicant, that the graphs in document A do apply to the sole influence due to selenium in the material, there is no clear indication that the presence of selenium in known glass materials would necessarily lead to an absorption parameter above 5 m^{-1} . The reference to a specific glass known as X-clear soda lime glass, with its high transparency for infrared radiation and an absorption of $3,5 \text{ m}^{-1}$ for 750 nm , is not conclusive in this respect and is without any bearing on the absorption properties resulting from the presence of selenium in other types of material.
15. All in all, the arguments presented by the applicant regarding the absorption properties in the infrared domain resulting from the presence of selenium in glass are not conclusive and not corroborated by any evidence. The declarations filed by the applicant are not sufficient to cast doubt on the teaching of D2 and the suitability of the glass sheets it discloses.
16. The replacement of the cover lens in the LiDAR device of D7 by a cover lens incorporating the glass material disclosed in D2, page 5, line 21 - page 6, line 10, leads to a detection device as claimed in claim 1. The

subject-matter of claim 1 is thus not inventive in the sense of Article 56 EPC.

Auxiliary request 1 - Consideration and allowability

17. Auxiliary request 1 differs from the main request in that use claim 9 has been deleted. The amended request constitutes an amendment to the party's case in the sense of Article 13(2) RPBA.
18. The new auxiliary request is a direct reaction to the Board's objection of lack of novelty for claim 9 according to the main request. The objection was based on a new document that had been introduced for the first time into the proceedings by the Board. These constitute exceptional circumstances in the sense of Article 13(1) RPBA. The amendment addresses the outstanding issue regarding novelty of claim 9 of the main request that is now obsolete. The amendment does not introduce any new issue.
19. Auxiliary request 1 is thus admitted into the appeal proceedings.
20. In substance, the amendment to the set of claims does not affect claim 1 of auxiliary request 1, which is thus also not inventive for the reasons developed above.

Auxiliary request 2 - consideration

21. Claim 1 of auxiliary request 2 incorporates the features of claim 4 of the main request regarding the configuration of the glass sheet and its coating. The

amendment is meant to address the objection of inventive step based on document D7 combined with D2.

22. The amended request constitutes an amendment to the applicant's case in the sense of Article 13(2) RPBA.
23. The Board fails to identify any exceptional circumstances that could justify the late filing of auxiliary request 2. The fact that auxiliary request 2, similar to auxiliary request 1, does not include use claim 9 does not affect this. The amendment in claim 1 addresses an objection that was relied upon by the Examining Division in its refusal and should, for that reason, have been filed, at the latest, with the statement of grounds, which must contain the applicant's complete appeal case (Article 12(3) RPBA).
24. Auxiliary request 2 is, therefore, not admitted into the proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Meyfarth

P. Scriven

Decision electronically authenticated