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**Datasheet for the decision
of 5 October 2015**

Case Number: T 1334/11 - 3.5.02

Application Number: 01123210.5

Publication Number: 1195574

IPC: F41G3/22

Language of the proceedings: EN

Title of invention:

Gaze-actuated information system

Patent Proprietor:

Rafael-Armament Development Authority Ltd.

Opponent:

Elbit Systems Ltd.

Relevant legal provisions:

EPC Art. 54, 56

Keyword:

Novelty - (yes)
Inventive step - (yes)

Decisions cited:

T 0332/87



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 1334/11 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 5 October 2015

Appellant: Elbit Systems Ltd.
(Opponent) P.O. Box 1165
Rehovot 76111 (IL)

Representative: Banzer, Hans-Jörg
Kraus & Weisert
Patentanwälte PartGmbH
Thomas-Wimmer-Ring 15
80539 München (DE)

Respondent: Rafael-Armament Development Authority Ltd.
(Patent Proprietor) P.O. Box 2250
31021 Haifa (IL)

Representative: Modiano, Micaela Nadia
Modiano Josif Pisanty & Staub Ltd
Thierschstrasse 11
80538 München (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 18 April 2011 rejecting the opposition filed against European patent No. 1195574 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman M. Ruggiu
Members: R. Lord
W. Ungler

Summary of Facts and Submissions

- I. This is an appeal of the opponent against the decision of the opposition division to reject the opposition against European patent No. 1 195 574. The opposition had been based only on grounds under Article 100(a) EPC (novelty and inventive step).
- II. The following documents cited during the procedure before the opposition division are relevant for this decision:
- D1: US 5 583 795 A,
 - D2: US 4 196 474 A,
 - D3: US 4 935 885 A,
 - D4: US 5 602 543 A,
 - D5: US 5 978 715 A,
 - D6: US 5 647 016 A,
 - P3: E. Wenzel and S. Foster, "Psychophysics and Technology of Virtual Acoustic Displays", Virtual Reality Annual International Seminar, IEEE, 1993,
 - P4: D.R. Begault et al, "Augmented TCAS Advisories using a 3-D Audio Guidance System", Proceedings of the Ninth International Symposium on Aviation Psychology, Columbus Ohio, 1997, and
 - P8: G.L. Calhoun, "Pilot-Vehicle Interface", RTO HFM Lecture Series on "Human Consequences of Agile Aircraft", 2000.
- III. In the statement of grounds of appeal dated 16 August 2011 the appellant requested that the decision under appeal be set aside and that the patent be revoked. As an auxiliary measure the appellant also requested that oral proceedings be held.

In a reply dated 21 February 2012 the respondent requested that the appeal be dismissed, and thus that the patent be maintained unamended (main request), as well as requesting on an auxiliary basis (in effect) that the decision under appeal be set aside and the patent be maintained in amended form on the basis of one of the first to fifth auxiliary requests filed with that reply. Oral proceedings were requested only if the board intended to revoke the patent.

In a further submission dated 6 August 2012 the appellant confirmed the requests indicated in the statement of grounds of appeal and presented further arguments relating to novelty and inventive step.

In a communication accompanying a summons to oral proceedings, dated 3 June 2015, the board presented its preliminary opinion that the subject-matter of claim 1 of the patent as granted was new, and indicated that it had doubts as to the formulations of the objective technical problem proposed by both parties.

In a letter dated 30 July 2015 the appellant withdrew their request for oral proceedings, as well as presenting brief comments on the board's communication.

With a letter dated 28 September 2015 the board cancelled the oral proceedings appointed for 27 October 2015.

IV. Claim 1 of the patent as granted (respondent's main request) reads as follows:

"A method for providing a pilot with information associated with at least one region of a field of view visible to the pilot from within a cockpit without

requiring a visual display, the method comprising the steps of:

- (i) determining an eye gaze direction relative to a given frame of reference for at least one eye of the pilot;
- (ii) determining a reference direction relative to said given frame of reference;
- (iii) comparing said eye gaze direction with said reference direction; and
- (iv) if said eye gaze direction and said reference direction are equal to within a given degree of accuracy, generating audio output audible to the pilot and indicative of information associated with said reference direction."

Claim 10 of the patent as granted reads as follows:

"A gaze-actuated information system for providing a pilot with information associated with at least one region of a field of view visible to the pilot from within a cockpit without requiring a visual display, the system comprising:

- (i) a gaze-direction determining system deployed within the cockpit and configured to determine a current gaze direction of the pilot relative to the cockpit;
- (ii) a direction correlation system associated with said gaze-direction determining system and configured to compare said current gaze direction with at least one reference direction and to generate a correlation signal when said current gaze direction is equal to said reference direction within a predetermined margin of error; and
- (iii) an audio output system associated with said direction correlation system and configured to be

responsive to said correlation signal to generate audio output audible to the pilot and indicative of information related to said reference direction."

Claim 15 of the patent as granted reads as follows:

"A method for providing to a pilot confirmation that a weapon system is locked-on to a visible target without use of a visual display, the method comprising the steps of:

- (i) determining an eye gaze direction relative to a given frame of reference for at least one eye of the pilot;
- (ii) determining a target direction representing the direction relative to said given frame of reference from the weapon system to the target to which the weapon system is locked-on;
- (iii) comparing said eye gaze direction with target direction; and
- (iv) if said eye gaze direction and said target direction are equal to within a given degree of accuracy, generating a predefined audible signal to confirm that the weapon system is locked-on to a target at which the pilot is currently gazing."

Claims 2 to 9 are dependent on claim 1, claims 11 to 14 on claim 10 and claims 16 to 19 on claim 15.

V. The arguments of the appellant which are relevant for the present decision can be summarised as follows:

The decision under appeal had interpreted P8 incorrectly, because it did not consider the teaching of the document as a whole in the manner required by case law such as T332/87. The skilled person would have

understood from P8 that each of the control options described in sections 6.3.1 to 6.3.6 could be used with each of the output options described in sections 6.3.7 to 6.3.9. The document therefore disclosed the use of the audio output of section 6.3.9 with the eye-gaze based control of section 6.3.2, in which context it was significant that section 6.3.2 left open the output modality to be used for the detailed information. That combination resulted in a method as defined in claim 1 of the patent in suit, as well as a system according to claim 10 and a method according to claim 15.

Document D6 also anticipated the method of claim 1 and the system of claim 10, because the expression "eye gaze direction" in the claim did not represent a clear distinction over the facial direction which was used in the method of D6. That this expression had a broad meaning was evident from the fact that a more detailed definition appeared in dependent claims 8 and 12 of the patent in suit.

If it were assumed that P8 did not anticipate the subject-matter of the independent claims, then from the point of view of inventive step the objective technical problem was to identify a suitable output modality for use in the method of section 6.3.2. The claimed solution of using an audio output was obvious to the skilled person because it was taught elsewhere in P8 (in particular the entirety of section 6.3.9, as well as the final sentence of section 6.3.7, the first paragraph of section 6.5.2 and figure 6.9 together with the first paragraph below it). This solution was also suggested by documents D2 to D5, P3 and P4. The feature "without requiring a visual display" had no restrictive effect on the subject-matter of the claims, because as was acknowledged by the respondent, the system could

still have included such a display. In any case, the effect achieved by using an audio output was only psychological, so was not technical and could not form the basis of an inventive step.

The subject-matter of the independent claims was also obvious starting from D1, for similar reasons.

The respondent's arguments concerning inventive step starting from D6 were not convincing, because they were based on an incorrectly formulated technical problem, and because the extension from head-tracking, as in D6, to eye-gaze based tracking in the claimed invention would have been obvious to the skilled person.

VI. The respondent argued essentially as follows:

The admissibility of document P8 was no longer disputed. Section 6.3.2 of that document did not leave open the nature of the output, since it clearly implied that it made use of a visual display, as was apparent from the first sentence of the second paragraph of that section, and from the references to "eye designated icons" and to "detailed information popping up" later in the same paragraph. In any case the use of any of the disclosed output modalities could not be assumed because they were not simple alternatives, but instead had distinctly different characteristics. The case law of T332/87 could not be applied here, because that decision concerned the combining of part of the generic teaching of a patent document with one of the embodiments in a straightforward manner, whereas the combination of different parts of P8 according to the appellant's argument was much more complex. It did not directly result in the claimed subject-matter, in particular because there was no suggestion in P8 to use

audio for the specific function defined in the claim. Also P8 contained no suggestion that the method could be carried out without requiring a visual display. The subject-matter of the independent claims was therefore new with respect to P8.

The skilled person would have understood that the expression "eye gaze direction" in the claims of the patent in suit had a different meaning from "facial direction" in D6. The fact that details of how the eye gaze direction is determined appear only in dependent claims was irrelevant in this context. Therefore the subject-matter of the independent claims was new over D6. It also involved an inventive step with respect to that document.

Section 6.3.2 of P8 disclosed the use of a visual display for the output, so that the technical problem proposed by the appellant was inappropriate. The problem should instead have been based on the disadvantages of the prior art described in paragraphs [0006] to [0008] of the patent. Thus the effect of the invention and the problem addressed by it were clearly technical. The use of an audio output as an alternative to the visual display of section 6.3.2 of P8, as defined in the independent claims, was not obvious to the skilled person, because the prior art concerning this form of output was either too general in nature (this applied especially to the first sentence of section 6.3.9, but also to documents D2 to D5) or was specifically related to different problems from that of the invention (as in the other cited parts of P8, as well as P3 and P4). Therefore the subject-matter of the independent claims involved an inventive step starting from P8.

The same conclusion applied starting from D1, because that document contained no more relevant teaching than P8.

Reasons for the Decision

1. The appeal is admissible.
2. *Novelty with respect to P8 (Article 54 EPC)*
 - 2.1 The appellant argues that the subject-matter of claims 1, 10 and 15 of the patent as granted is anticipated by the disclosure of document P8. The board is not convinced by this argument, for the reasons explained below.
 - 2.2 It is not disputed that section 6.3.2 of P8 discloses a method for providing a pilot with information associated with at least one region of a field of view visible to the pilot from within a cockpit, the method comprising the steps of:
 - (i) determining an eye gaze direction relative to a given frame of reference for at least one eye of the pilot;
 - (ii) determining a reference direction relative to said given frame of reference;
 - (iii) comparing said eye gaze direction with said reference direction; and
 - (iv) if said eye gaze direction and said reference direction are equal to within a given degree of accuracy, generating an output perceptible to the pilot and indicative of information associated with said reference direction.

2.3 In the context of the interpretation of this section of P8, the appellant argues that it does not disclose the "output modality" (i.e. whether the output generated in step (iv) of the claim is in visual, audio or tactile form). The board considers however that the second paragraph of section 6.3.2 contains clear indications that a visual display is used, specifically:

- the second sentence of the second paragraph states that "Eye-based control is similar to operating a computer mouse in the sense that gaze position indicates the position or response option on a display", thus indicating that eye-based control involves the use of a visual display;
- the penultimate sentence of the same paragraph refers to "eye designated icons", which clearly requires the use of a visual display; and
- the final sentence of that paragraph describes "detailed information popping up", again implying the use of a visual display.

2.4 The appellant argues that the skilled person would understand P8, taken as a whole, as disclosing that any of the control options described in sections 6.3.1 to 6.3.6 could be used with any of the "display" options of sections 6.3.7 to 6.3.9, so that in particular the eye gaze control option of section 6.3.2 could be used with the "audio display" option of section 6.3.9, thus resulting in a method according to claim 1 of the patent in suit. The board does not find this argument convincing, because, even if it were accepted that the method of section 6.3.2 could be combined in some way with an audio display technique, it would not follow directly that the audio technique would be used for the purpose defined in section (iv) of the claim, rather than for some unrelated purpose (the issue of what forms of audio display are disclosed in P8 is discussed

in more detail in section 4.3.1 below). Moreover, such a combination would still require a visual display, so would not be as claimed.

2.5 In the above context the appellant referred to the case law represented by decision T332/87 (not published in OJ) relating to the interpretation of documents. The board is however of the opinion that the circumstances described in the previous paragraph do not correspond to those of that decision. In that decision the subject-matter of the claim in suit was derived by a straightforward combination of part of the generic disclosure of a prior art patent document with one of the embodiments. However, as discussed above, in the present case the simple combination of the different parts of P8 would not lead to the claimed subject-matter, since feature (iv) would result only if they were combined in a specific manner, for which there is no suggestion in P8, and even that would not lead to the feature "without requiring a visual display".

2.6 The board therefore concludes that the subject-matter of claim 1 of the patent in suit is new with respect to document P8. This conclusion applies correspondingly to claims 10 and 15.

3. *Novelty with respect to D6 (Article 54 EPC)*

Document D6 describes a method for providing a pilot with information associated with at least one region of a field of view visible to the pilot from within a cockpit which makes use of facial direction detection (see e.g. the abstract and figure 1). The appellant argues that this can be considered as disclosing the method of claim 1 of the granted patent because the expression "eye gaze direction" used in the claim

covers the facial direction of D6. The board does not find this argument convincing, because in this technical field the skilled person makes a clear distinction between eye gaze direction on the one hand and facial or head direction on the other hand, as is evident for instance from a comparison of sections 6.3.1 and 6.3.2 of P8. The mere fact that dependent claim 8 of the patent in suit defines details of how the eye gaze direction is determined cannot be taken as implying (as argued by the appellant) that the expression "eye gaze direction" in claim 1 covers also facial direction, because that would be contrary to the normal use of that expression in the technical field. The board therefore concludes that D6 does not disclose the detection of eye gaze direction, so that the subject-matter of claim 1 of the granted patent, as well as that of claims 10 and 15, is new with respect to that document.

4. *Inventive step starting from P8 (Article 56 EPC)*

4.1 From the conclusions in section 2. above it follows that the method of claim 1 of the patent in suit is distinguished from that of P8 in that it functions "without requiring a visual display", and in that in step (iv) the information is generated as "audio output audible to the pilot".

4.2 The two parties have presented differing proposals for the objective technical problem addressed by the claimed method.

4.2.1 The appellant has proposed the problem as "Identifying a suitable output interface for outputting the additional data or information called up by the pilot's eye gaze in the procedure of section 6.3.2 of P8" (see

section V.2., first paragraph of the grounds of appeal of 16 August 2011). This formulation is however based on the assumption that in that section of P8 the nature of that output is left open. However, as discussed in detail in section 2.3 above, the board considers that it is clear that the output interface is in the form of a visual display. The board therefore concludes that this formulation of the technical problem is not appropriate.

4.2.2 The appellant's arguments in this respect are also based on the assumption that the definition that the method functions "without requiring a visual display" has no limiting effect, because it does not exclude that the system used for carrying out the method includes a visual display. The board considers in this respect that the appellant is correct in concluding that the system can include a visual display, but that the definition nonetheless represents a restriction, because it specifies that the claimed method of providing information to the pilot does not require the use of any such display.

4.2.3 The respondent on the other hand proposes on page 13 of the letter dated 21 February 2012 that the technical problem should be based on the disadvantages of the prior art discussed in paragraphs [0006] to [0008] of the patent. However, the board understands that those disadvantages related mainly to systems using helmet-mounted displays and which did not use eye gaze tracking. Since the method of P8 as discussed above includes eye gaze tracking, it follows that those disadvantages cannot be assumed to be relevant when comparing the claimed method to that of P8.

4.2.4 Nonetheless, the board considers that, in the light of the disclosure of paragraphs [0014] and [0037] of the patent, and taking into account the points raised in paragraph 4.2.2 above, it is reasonable to assume that, even if the system does include a visual display, the simplification resulting from the fact that this display is not required for the critical task of providing information to the pilot about the object at which he is looking (e.g. a potential target) would result in at least some diminution of the disadvantages described in the sections of the patent referred to by the respondent. Thus it would appear appropriate to assume that the objective technical problem is to reduce the weight of the helmet and/or to reduce the number of connections to it.

4.2.5 In the light of this conclusion, the board considers also that the appellant's argument that the problem addressed by the claimed invention is not technical is not valid.

4.3 It thus remains to be considered whether it would have been obvious for the skilled person to solve this objective technical problem by the means defined in the claim, i.e. in particular by use of audio instead of video for providing the additional information.

4.3.1 As the appellant has noted, document P8 contains several passages relating to the use of auditory displays in cockpit systems. Considering these in the order in which they appear in that document, the board observes the following:

- the final sentence of section 6.3.7 relates only to the use of auditory signals for improving attitude awareness;

- the first sentence of section 6.3.9 describes the use of auditory displays only in a general sense;
- the remainder of that section on the other hand is concerned with specific cases of using auditory information, in particular use of a 3-D auditory display to provide information about objects outside the visual field, thus suggesting combination with a visual display;
- the disclosure of section 6.5.2, last sentence of first paragraph, also relates to a combination of visual and auditory displays, with the aim of reducing search times;
- the teaching of the first paragraph on page 5-16 and figure 6.9 concerns the use of an auditory system for high urgency display elements when the visual channel is overloaded.

The board considers that none of these passages provides any suggestion to replace the visual information described in section 6.3.2 of P8 with auditory information in the manner defined in step (iv) of claim 1 of the granted patent, because they are either too general in nature to suggest such a specific modification, or they relate to entirely different aspects of the system, so that the skilled person would not consider them to be relevant to the objective technical problem. Moreover they suggest at most providing auditory information in addition to the visual, thus providing no suggestion to modify the method so that it does not require a visual display. The board therefore concludes that the subject-matter of claim 1 of the patent in suit would not be obvious in the light of the teaching of P8.

4.3.2 The appellant has also argued that documents D2 to D5, P3 and P4 provide relevant teaching in this respect. However, the board agrees with the respondent that

these documents provide no relevant teaching beyond that of P8 as discussed in the previous paragraph. In particular, documents D2 to D5 only provide general indications about the use of auditory displays, so could not suggest the specific use of such displays claimed, whereas P3 and P4 concern 3-D auditory displays, and thus their relevant content is similar to section 6.3.9 of P8 as discussed above.

4.4 The board therefore concludes that the subject-matter of claim 1 of the granted patent involves an inventive step when starting from P8, whether taking that document alone or in combination with any of documents D2 to D5, P3 and P4. This conclusion applies correspondingly to the subject-matter of claims 10 and 15.

5. *Inventive step starting from D1 (Article 56 EPC)*

From the appellant's arguments concerning document D1 it is apparent that its disclosure in terms of the features of claim 1 of the patent in suit does not extend beyond that of P8. Therefore the conclusion that the subject-matter of claims 1, 10 and 15 involves an inventive step starting from P8 applies also when starting from D1.

6. *Inventive step starting from D6 (Article 56 EPC)*

In the statement of grounds of appeal of 16 August 2011 the appellant referred to document D6 only in the context of novelty (see section 3. above), not of inventive step. Nonetheless the respondent in the reply of 21 February 2012 presented arguments concerning this document relating to both novelty and inventive step. The only arguments presented by the appellant in this

context are those on pages 15 and 16 of the letter of 6 August 2012. These do not constitute a reasoned argument as to why the subject-matter of the claims of the patent in suit does not involve an inventive step, but instead merely explain why the appellant disagreed with the arguments in favour of inventive step presented by the respondent. However, since the present appeal is an appeal of the opponent against the rejection of the opposition, the onus is on the appellant to demonstrate why the claimed subject-matter does not involve an inventive step. The appellant's arguments as to why the respondent's reasoning was incorrect clearly do not meet that requirement. The board notes also that on page 17 of the letter of 6 August 2012 the appellant refers in this context to the arguments in the notice of opposition of 21 August 2006 as providing "More detailed argumentation". However, that notice contained no arguments concerning inventive step starting from D6. The board therefore concludes that the subject-matter of claims 1, 10 and 15 of the patent in suit involves an inventive step starting from D6.

7. The board therefore concludes that the subject-matter of the independent claims of the patent as granted is new and involves an inventive step. The remaining claims of the granted patent are dependent on those claims, so that their subject-matter is also new and involves an inventive step. No further grounds for opposition were raised by the appellant. Therefore none of the grounds for opposition raised by the appellant prejudices the maintenance of the patent as granted, so that the board has to accede to the main request of the respondent to dismiss the appeal. It was therefore not

necessary for the board to consider the respondent's auxiliary requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



U. Bultmann

M. Ruggiu

Decision electronically authenticated