BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 13/91 - 3.4.2

Application No.: 83 306 842.2

Publication No.: 0 112 031

Title of invention: Position detector

Classification: G01B 11/00

D E C I S I O N
of 17 September 1992

Proprietor of the patent: HELITUNE LIMITED

Opponent: DYNAMIC INSTRUMENTS, INC

Headword:

EPC Articles 54 and 56

Keyword: "Novelty (Claim 1): no"
"Inventive step (Claim 9): no"

Case Number : T 13/91 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 17 September 1992

Appellant : (Proprietor of the patent)
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Decision under appeal :
Decision of Opposition Division of the European Patent Office dated 25 September 1990 posted on 31 October 1990 revoking European patent No. 0 112 031 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : W.W.G. Hofmann
Members : M. Chomentowski
M.V.E. Lewenton

Summary of Facts and Submissions

I. European patent No. 0 112 031 was granted on the basis of European patent application No. 83 306 842.2.

II. The patent was revoked by a decision of the Opposition Division on opposition by the Respondent (Opponent), on the ground that its subject-matter according to four of the five requests submitted by the Appellant (Patentee) did not involve an inventive step, and according to the remaining one of the requests extended beyond the content of the application as filed.

In the reasons for the decision the following documents were inter alia referred to:

(D1) Instruction Manual "Model CCD 1300 line-scan camera subsystem" of Fairchild Camera and Instrument Corporation, 1977;

(D2) US-A-3 856 410.

III. The Appellant lodged an appeal against this decision.

IV. By summons dated 29 April 1992 both parties were summoned to oral proceedings to be held on 17 September 1992. In the letter of 23 June 1992, with reference to the summons, the Appellant notified the Board that he would not be represented at the hearing, and that the proceedings might be decided, so far as the Appellant was concerned, on the basis of the written record.

Oral proceedings were held in the absence of the Appellant. No new facts or evidence were submitted. At the end of the oral proceedings, the Respondent requested that the appeal be dismissed.

According to the notice of appeal, the Appellant requested that the decision of the Opposition Division be set aside and the patent be sustained on the basis of the claims as originally granted.

V. Independent Claims 1 and 9 now under consideration read as follows:

"1. A position detector comprising means (14) defining a narrow vertical strip field of view, a target (17) arranged to cross the field of view and capable of being in any of a range of positions along the vertical strip characterised by a sensor (11) in the form of a line of sensitive elements extending parallel with the narrow vertical strip field of view, and electronic means (12) for repeatedly scanning the elements in scanning cycles and for detecting the position of a reference part (18) of the target along the field of view as the target crosses the field of view."

"9. A method of testing a helicopter rotor in which a narrow vertical strip field of view is defined by means (14), the rotor is rotated so that the blades in turn cross this vertical strip, characterized in that a multi-element sensor (11) extending parallel with the narrow vertical strip field of view is repeatedly scanned in scanning cycles, and the position of the various blades in the field of view are computed from signals derived during the scanning cycles."

Claims 2 to 8 and 10 are dependent on Claims 1 and 9 respectively.

VI. The arguments presented by the Appellant are in substance as follows.

It would not be normal technological progress to replace the equipment taught by D2 by the camera described in D1. If the skilled person starts from D2, he believes that a frequency of 30 kHz is necessary for making measurements on helicopter rotors. If he then reads D1, he finds that its frequency of operation is not as fast as D2 says is necessary and will not follow that line of development.

Moreover, of the two embodiments given in D2, the first has a narrow vertical strip field of view and no scanning, the second has scanning but no narrow vertical field of view. Thus, D2 teaches that what is needed is either the one or the other of these features, but not both. The camera according to D1 is of no use in connection with the first embodiment of D2 which is, however, the only embodiment defining a narrow vertical strip field of view in accordance with the present claim.

The subject-matter of Claim 1 - and similarly of Claim 9 - thus involves an inventive step.

VII. The Respondent's arguments may be summarised as follows.

The patent at issue makes no mention of a scan rate. This emphasises that the scan rate is subject to ordinary design considerations of the skilled person. The skilled person would appreciate not only that the camera according to D1 could be made to operate faster, but also that a fast scan rate is not necessary.

A person skilled in the art reading D2 as a whole would recognise that what is required is a narrow vertical strip field of view. In the first embodiment the aperture 10 limiting the field of view is directly mentioned, and in the second embodiment the operation of deflecting the particular beam of electrons and passing it through a

small opening would provide a narrow vertical strip of the field of view. Therefore, the combination of D2 and D1 leads in an obvious way to the subject-matter of Claim 9.

Claim 1 is directed to a position detector and is not limited to the use in testing a helicopter rotor or to any specific form or motion of a target. All the other features of Claim 1 are anticipated by D1. The subject-matter of Claim 1 thus lacks novelty.

Reasons for the Decision

1. The appeal is admissible.

2. Claim 1

2.1 The document D1 discloses a line scan camera. This camera (cf. in particular chapters 1.2, 7.1.2, 7.1.5 and 7.1.6) comprises a sensor in the form of a line of sensitive elements which - together with the lens of the camera - define a narrow strip field of view which is necessarily parallel with this line of sensitive elements.

2.2 Contrary to the opinion of the Appellant (for which, however, he never gave any specific reasons) and to the view taken by the Opposition Division, the Board does not see in Claim 1 any feature defining a second element which - in addition to the line of sensitive elements - would limit the field of view in a specific way. In view of the fact that in an optical system the limitation of the field of view is performed in or near the image plane (or conjugated planes thereof which do not exist in the present optical system) and that in the present case the sensitive elements are positioned in this image plane, cf. Figure 3) the most reasonable interpretation of the text

"line of sensitive elements extending parallel with the narrow vertical strip field of view" appears to be that the sensitive elements themselves are these means defining the field of view.

2.3 The camera known from D1 also comprises electronic means for repeatedly scanning the elements in scanning cycles and for detecting the position of a reference part of the target (e.g. the edge of an opaque sheet) along the field of view as the target crosses the field of view (cf. e.g. chapter 7.1.6). It is thus a position detector.

2.4 D1 mentions such movement of the target and expressly points to such use of the camera, in correspondence with the indications given in present Claim 1. It should, however, be noted that even without such explicit disclosure the camera described in D1 would anticipate the position detector according to Claim 1. As the Respondent has pointed out, the target and its movement are not part of the claimed position detector, and can therefore define the position detector only in the sense of "being suitable for measuring such moving targets".

Similarly, the fact that according to Claim 1 the strip field of view is "vertical" can only refer to the intended use since the detector itself remains the same independent of its orientation in space. The detector known from D1 is also suitable for being operated with a vertical field of view.

2.5 Therefore, the Board comes to the conclusion that the subject-matter of Claim 1 lacks novelty in the sense of Article 54 EPC.

3. Claim 9

3.1 Method Claim 9 relates to testing a helicopter rotor and to rotating the rotor so that the blades in turn cross the vertical strip field of view. With respect to this claim, D2, which discloses such a method of testing a helicopter rotor, constitutes the closest prior art document (cf. in D2 in particular Figures 1 and 7; column 1 and column 6, line 16 to column 7, line 24). According to D2, the electron image of a sensor onto which the blade tips are imaged is repeatedly scanned in scanning cycles so that the scanned points of the sensor surface define a narrow strip, and the positions of the various blades in the field of view are computed from signals derived during the scanning cycles.

3.2 In D2, it is not the optical field of view that is linearly restricted by the sensor, but the electron distribution corresponding to the optical image. It is a matter of opinion whether this electronic scanning according to D2 is seen as defining the field of view in the sense of Claim 1. In any case, this scanning determines which part (a narrow vertical strip part) of the scenery surrounding the camera is allowed to contribute to the signals processed in the testing apparatus, and thus corresponds to the essential point in the respective feature of Claim 9. The difference might, however, remain that this restriction is not performed in the optical path.

Moreover, the sensor of D2 is not a multi-element sensor.

3.3 What specific problem is solved by the only distinguishing features of Claim 9 ("multi-element sensor" and optically restricted field of view instead of electronically restricted field of measurement) or which advantages are achieved, is not stated in the patent in suit (the

comparison of accuracies made in column 1, lines 37 to 43, relates to the (more remote) first embodiment of D2), nor has the Appellant made any statements in this respect. Therefore, what remains is only the general problem of detecting the vertical position of the tips of rotor blades of the helicopter rotor as they rotate (cf. column 1, lines 5 to 7 of the patent specification) which corresponds to the problem underlying D2.

3.4 It is clear that electronic tubes as the one used as a sensor according to D2 are relatively bulky and not apt to integration. For these reasons it has long been the trend in electronics to replace electronic tubes by solid state electronic elements. In the view of the Board, a person skilled in the art would therefore be led to the idea of replacing the electronic tube of D2 by a solid state element capable of also functioning as an image sensor and of also scanning the image along a narrow line. The CCD sensor of the camera described in D1 (which is a multi-element sensor in the sense of Claim 9) fulfils these conditions, and it was therefore obvious to try such a multi-element sensor. This sensor consists of a line of photosensitive elements and therefore has the effect - together with the focusing lens - of optically defining a narrow strip field of view which is necessarily parallel with the sensor.

The Appellant has argued that a person skilled in the art would have been discouraged from trying the camera of D1, by the fact that this camera has a line scan rate of only 10 kHz whereas the scan rate of the photosensitive tube of D2 is 30 kHz. The Board is, however, of the opinion that the skilled person would have readily realised that 10 kHz is actually sufficient for testing a helicopter rotor, this being the more so since present Claim 9 does not contain any specific definitions regarding a minimum speed of the rotor blades to be measured.

3.5 Therefore, the subject-matter of Claim 9 lacks an inventive step in the sense of Article 56 EPC.

4. Since the subject-matter of Claim 1 lacks novelty and that of Claim 9 lacks an inventive step, these claims are not allowable under Article 52(1) EPC.

5. Claims 2 to 8 and 10 are also not allowable because of their dependence on Claims 1 and 9.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

P. Martorana W. Hofmann