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**Datasheet for the decision  
of 11 November 2022**

**Case Number:** T 0619/19 - 3.4.01

**Application Number:** 14169862.1

**Publication Number:** 2793163

**IPC:** G06K7/10

**Language of the proceedings:** EN

**Title of invention:**  
Image capturing device

**Patent Proprietor:**  
Datalogic IP TECH S.r.l.

**Opponent:**  
Bundesdruckerei GmbH

**Headword:**  
Image reader 2 / DATALOGIC

**Relevant legal provisions:**  
EPC Art. 56  
RPBA Art. 12(4)

**Keyword:**

Inventive step - (no)

Late-filed request - submitted with the statement of grounds  
of appeal



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Case Number: T 0619/19 - 3.4.01

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.01**  
**of 11 November 2022**

**Appellant:** Datalogic IP TECH S.r.l.  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
16 January 2019 concerning maintenance of the  
European Patent No. 2793163 in amended form.**

**Composition of the Board:**

**Chair** R. Winkelhofer  
**Members:** B. Noll  
A. Wahrenberg

## **Summary of Facts and Submissions**

- I. European patent EP 2793163 was granted on divisional European application 14169862.1, originating from earlier application no. 10719645.3 granted as European patent EP 2545491. Both patents were opposed by the same opponent, and both decisions of the Opposition Division were appealed (T 439/18 is the case number in the parent case).
  
- II. The opposition in this case was based on the grounds of lack of inventive step (Article 100(a) EPC).
  
- III. In the opposition proceedings, the patent proprietor submitted six auxiliary requests in response to the notice of opposition and further three auxiliary requests after the summons to oral proceedings setting out the Opposition Division's provisional opinion.
  
- IV. The Opposition Division held that the patent in amended form on the basis of the first auxiliary request met the requirements of the EPC.
  
- V. Appeals against the Opposition Division's decision were filed by both the proprietor and the opponent.
  
- VI. With the statement of grounds of appeal, the proprietor submitted auxiliary requests 1 to 34 (with auxiliary requests 31 to 34 being identical to former auxiliary requests 5 to 8, and auxiliary request 13 to former

auxiliary request 9). Auxiliary request 1 was later withdrawn.

VII. The proprietor requests that the decision under appeal be set aside and amended such that the opposition be rejected, or that the patent be maintained on the basis of auxiliary requests 2-34.

VIII. The opponent requests that the decision under appeal be set aside and amended such that the patent be revoked.

IX. Claim 1 of the main request reads (reference signs omitted):

*Imager type reader of optical information,  
comprising:*

*- an image forming device including a sensor including a one-dimensional or two-dimensional array of photosensitive elements, and defining an optical reception axis, at least one reading distance, and a region framed by the sensor on a substrate at said at least one reading distance,*

*- an illumination device including an array of adjacent light sources, defining an optical illumination axis,*

*- wherein each light source is adapted to illuminate an area smaller than the size of said region framed by the sensor,*

- wherein the light sources of the array are micro-emitters, made with gallium nitride (GaN) technology,

- and wherein the illumination axis does not coincide with the reception axis.

X. Claim 1 of auxiliary request 2 adds:

*the illumination device being able to illuminate the entire working space region of the image forming device,*

and further defines that each light source

*comprises a single illuminating element.*

XI. Claim 1 of auxiliary request 3 adds to claim 1 of auxiliary request 2:

*the light sources are individually drivable.*

XII. Claim 1 of auxiliary request 4 adds to claim 1 of the main request:

*the illumination device being able to illuminate the entire working space region of the image forming device*

and changes the words "optical information" to "optical codes".

XIII. Claim 1 of auxiliary request 5 combines the features of claim 1 of auxiliary requests 2 and 4.

XIV. Claim 1 of auxiliary request 6 combines the features of claim 1 of auxiliary requests 2 and 5.

XV. Claim 1 of auxiliary request 7 adds to claim 1 of the main request:

*the illumination device being able to illuminate the entire working space region of the image forming device, wherein the working space region is the region of space in which optical information is correctly framed by the sensor and the image of which is sufficiently focussed on the sensor.*

XVI. The respective claim 1 of auxiliary requests 8-12 combines the features of claim 1 of auxiliary request 7 with those of claims 1 of auxiliary requests 2-6.

XVII. Claim 1 of auxiliary request 13 replaces in claim 1 of the main request the first paragraph by:

*Portable imager type reader of optical information, comprising in a single casing.*

XVIII. The respective claim 1 of auxiliary requests 14 and 15 combines the features of claim 1 of auxiliary request 13 with those of claims 1 of auxiliary requests 2 and 3.

XIX. Claim 1 of auxiliary request 16 adds to claim 1 of the main request:

*the illumination device being able to illuminate the entire working space region of the image forming device,*

and further defines the sensor included in the image forming device as a single sensor and the array of adjacent light sources as a single array.

XX. The respective claim 1 of auxiliary requests 17-21 combines the features of claim 1 of auxiliary request 16 with those of claims 1 of auxiliary requests 2-6.

XXI. The respective claim 1 of auxiliary requests 22-27 combines the features of claim 1 of auxiliary request 13 with those of claims 1 of auxiliary requests 16-21.

XXII. Claim 1 of auxiliary requests 28-30 combines the features of claim 1 of auxiliary request 13 with those of claims 1 of auxiliary requests 16-18.

XXIII. Claim 1 of auxiliary request 31 adds to claim 1 of the main request:

*by each light source being sufficiently collimated and emitting according to suitable directions, or by each light source being provided with an optical element selected from the group consisting of its own projection lens, a diaphragm, a prismatic*

*surface, a light guide, a gradient index lens, and combinations thereof.*

XXIV. Claim 1 of auxiliary request 32 adds to claim 1 of auxiliary request 31:

*the illumination device being able to illuminate the entire working space region of the image forming device.*

XXV. Claim 1 of auxiliary request 33 adds to claim 1 of the main request:

*wherein the elementary area framed by each photosensitive element of the sensor can be illuminated at most by four light sources arranged adjacent to one another forming a square in the array of adjacent light sources, or at most by two adjacent light sources when the array of adjacent light sources is a one-dimensional array.*

XXVI. Claim 1 of auxiliary request 34 adds to claim 1 of the main request:

*said array of adjacent light sources including light sources that illuminate the boundary of the region framed by the sensor on the substrate at said at least one reading distance, light sources that illuminate within said boundary, and light sources that illuminate outside of said boundary.*

XXVII. The following documents are relevant for this decision:

O5: US 2001/0035489 A1; and  
O25: WO 2009/100358 A1.

XXVIII. The parties' submissions, insofar as they are relevant for the decision, are discussed in the reasons for the decision, below.

## **Reasons for the Decision**

### *The patent, background*

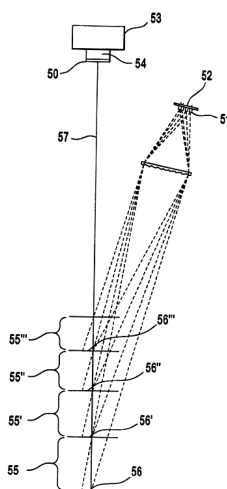
1. The patent relates to an optical reader. The reader is for capturing an image on a surface of a product or a substrate containing readable information. The reader has an image sensor and, although not explicitly defined in claim 1, imaging optics which define an optical reception axis (Z). Thus, the reader is for imaging an area of the surface determined by the size and shape of the image sensor, the imaging optics, and the distance between the surface and the reader. The relation between the imaged area and the size and shape of the image sensor is known by the imaging law of geometric optics. The area is called in claim 1 of the patent the *region framed by the sensor on the substrate*.

For illuminating the surface, the reader has an illumination device. It is placed sideways of the optical reception axis (Z) so that the direction of light propagating from the light source is different from the optical reception axis. This way of

illumination is expressed in claim 1 by defining an *illumination axis* (A) which does not coincide with the optical reception axis. This has the effect that the area on the surface that is illuminated depends on the distance between the surface and the reader. For example, when the illumination device is placed to the right of the optical reception axis, the illuminated area moves further to the left the further away the area is from the image sensor.

*Main request, claim 1, inventive step*

2. O5 discloses an image capturing device as outlined above. Its optical part is schematically illustrated in Fig. 6 of O5:



**FIG. 6**

3. The image capturing device has a camera (55), comprising a linear array sensor of photosensitive elements (O5, paragraph 27). The sensor optics, labelled as 54 in Fig. 6, defines an optical reception axis (57). The image sensor operates at a range of reading distances which are indicated as partial depths of field 55 to 55''' in Fig. 6. The sensor in

combination with the sensor optics defines a region on the scene to be imaged.

4. The image capturing device further comprises an illumination device in the form of a set of juxtaposed linear arrays of light sources (51, Fig. 6). The illumination device is configured to power on or off a selected linear array depending on the distance between the scene and the image sensor. The skilled reader would have understood that the arrangement in Fig. 6 of O5 operates such that the most left linear array of light sources is switched on when the image sensor images a scene at the furthest depth of field 55, and the most right linear array is switched on when it images a scene at the nearest depth of field 55'''. Each of the linear arrays of light sources consists of a set of LEDs arranged next to each other as shown in Fig 4. A single linear array is configured to illuminate a narrow strip 56, 56', 56'' or 56''' at a certain distance. Therefore, it illuminates, in the broadest sense of words, an area smaller than the total field of view of the image sensor. Fig. 6 further shows that an illumination axis, which is the principal direction of the light from the arrays of the light source, is oblique in relation to the optical reception axis 57.
5. The capturing device according to claim 1 differs from the one disclosed in O5 in that the light sources are micro-emitters made with gallium nitride (GaN) technology.
6. LEDs made from GaN are commonly known as emitting at the short wavelength range of the visible spectrum. They are, therefore, convenient sources for light in the range of green or blue.

The technical problem to be solved starting out from O5 may thus be seen as to choose suitable light sources.

7. O25 discloses LED light elements made with GaN technology and designed as micro-LEDs for the purpose of illumination (see O25, [0006] and [0016]). Starting from O5 and further considering the teachings of O25, the skilled person would have arrived at the device of claim 1.
8. The proprietor argued that O25 disclosed only a single light source consisting of a large number of micro-emitters. In the meaning of the patent, however, a light source had only a single micro-emitter. The skilled person would, therefore, not have arrived at the claimed device when combining O5 and O25.
9. The Board does not agree. Claim 1 is not limited in the sense of the proprietor's argument, as the wording of claim 1 is unspecific as regards the number of micro-emitters made of GaN that together form a light source.
10. In summary, claim 1 as granted lacks an inventive step having regard to O5 and O25 in combination (Article 56 EPC). The main request is thus not allowable.

*Auxiliary request 2, claim 1, inventive step*

In O5, the arrays of the light source and the optics are configured such that the area 56 imaged by the imaging device is illuminated for the whole range of depths of fields 55 to 55''', by switching between different arrays for different depths of fields. The feature that the illumination device is able to

illuminate the entire working space region of the image forming device, therefore, does not further distinguish the claimed image reader from O5.

The further feature, defining that each light source comprises a single illuminating element, is described in paragraph 119 of the patent specification as an alternative to light sources comprising a plurality of illuminating elements collected in groups. Implementing each light source as having a single illuminating element is no more than an obvious alternative for the light emitting portion of a light source and would have been, therefore, obvious to the person skilled in the art.

The proprietor argued that O25 disclosed a light source based on SiN material having a large number of illuminating elements. It would, therefore, not have been obvious from O25 to provide a light source made from SiN having only a single illumination element.

The Board does not agree, either in this context. The number of illuminating elements is chosen according to the required luminosity of the light source. The skilled person would have considered a light source having only a single illumination element as an obvious alternative to one having many illumination elements, if the luminosity of the single illumination element had been sufficient.

Claim 1 of auxiliary request 2 lacks an inventive step for these reasons (Article 56 EPC), too. Auxiliary request 2 is, therefore, also not allowable.

*Auxiliary request 3, claim 1, inventive step*

11. The additional feature of individually driving light sources in claim 1 of auxiliary request 3 has the technical effect that a portion of the scene can be individually illuminated.
12. Considering this effect, the partial technical problem addressed by this feature starting from O5 is to control the array of light sources so that only a portion of the scene is illuminated.
13. The skilled person would have been led by O5, paragraph 5, to provide as a light source an array of LEDs in which power input to individual LEDs might be modulated so that different LEDs might be energised differently, according to a desired application. Thus, the image capturing device of claim 1 would be obvious to the skilled person.
14. The proprietor argued that O5, paragraph 5, concerned the background art and would not have been considered by the skilled person in connection with the reader shown in Fig. 6 of O5.
15. The Board does likewise not agree. Paragraph 5 of O5 generally refers to advantageous properties of illumination devices made by LED and suggests modulating single LEDs dependent on the desired application. The skilled person would therefore have considered driving single light sources individually.
16. Auxiliary request 3 is therefore also not allowable for lack of inventive step (Article 56 EPC).

17. In the opposition proceedings, the proprietor defended the patent in the version as granted and in amended form on the basis of 9 auxiliary requests. Auxiliary request 4 defined an "optical code" instead of "optical information", to restrict the claimed reader in terms of its intended use; auxiliary requests 5 and 6 (now 31 and 32) defined the optical elements for imaging and directing the light from the light source; auxiliary request 7 (now 13) defined the image reader as being portable and having a single casing; auxiliary request 8 (now 33) defined a maximum number of light sources illuminating the area of the scene viewed by a single image sensing element; auxiliary request 9 (now 34) defined an association of light sources device for illuminating inside, on or outside the boundary of the frame defined by the sensor.
18. These requests were already divergent relative to the higher-ranking auxiliary requests 2 and 3.
19. With the statement of grounds of appeal, the proprietor submitted 34 auxiliary requests, which arose from the requests present in the opposition proceedings by taking up further features from the description and varying these with the already existing claim versions.

The first of these two features concerns a definition of the working space region by a reference to a "correct framing" of optical information to be imaged and "sufficiently focussed" on the sensor.

The second feature defines the sensor as a single sensor and the array of adjacent light source as a single array.

20. These additional features introduce further divergent lines of defence of the patent, and are, in addition, permuted with the - already divergent - lines on file in the opposition proceedings.
21. The proprietor argued that the auxiliary requests submitted with the grounds of appeal were, on the one hand, a reaction to the Opposition Division's reasoning for the decision on patentability, having regard to a document O2 and, on the other hand, to objections under Articles 83 and 84 EPC raised by the opponent for the first time in the oral proceedings before the Opposition Division.
22. However, the Opposition Division had given an opinion on patentability in relation to O2 with the summons to oral proceedings (communication of 30 November 2017, points 3 and 3.1-3.7), which was adopted almost identically in the grounds for the decision (points 10, 10.1-10.7). If the proprietor had intended to counter this opinion by amendments, they would have had a reason to submit amendments to this objection during the opposition proceedings.
23. As regards the objections under Articles 83 and 84, concerning the amendments submitted during the opposition proceedings, these were not considered persuasive by the Opposition Division.
24. There was thus no reason to increase the number of lines for defending the patent in the appeal proceedings.
25. The increase of various divergent lines of claim restrictions in appeal, and additionally permutating these new lines with the lines of defence already

present in the opposition proceedings, led to an undue procedural situation in which the proprietor ultimately delegated to the Board the choice of the version on which to potentially maintain the patent. Such a conduct does not constitute a proper procedural defence in appeal proceedings (T 1685/07, reasons 6.5 et seq., with further references; [T 926/10](#), reasons 3.2).

26. For these reasons, auxiliary requests 4-34 which are all divergent to the higher-ranking requests, cannot be considered in the appeal proceedings (Article 12(4) RPBA 2007, Article 25(2) RPBA 2020).

## Order

### For these reasons it is decided that:

- 1.The decision under appeal is set aside.
- 2.The patent is revoked.

The Registrar:

The Chair:



D. Meyfarth

R. Winkelhofer

Decision electronically authenticated