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**Datasheet for the decision  
of 10 November 2022**

**Case Number:** T 0439/18 - 3.4.01

**Application Number:** 10719645.3

**Publication Number:** 2545491

**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 1 /DATALOGIC

**Relevant legal provisions:**  
EPC Art. 56, 100(b), 122(3)

**Keyword:**  
Inventive step - after amendment



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Case Number: T 0439/18 - 3.4.01

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.01**  
**of 10 November 2022**

**Appellant:** Datalogic IP TECH S.r.l.  
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**Representative:** Patentship  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
22 December 2017 concerning maintenance of the  
European Patent No. 2545491 in amended form.**

**Composition of the Board:**

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

## **Summary of Facts and Submissions**

- I. European patent EP 2545491 was granted on European application 10719645.3, being the parent of divisional application 14169862.1 (patent number EP2793163). Both were opposed by the same opponent, and both decisions of the Opposition Division were appealed (T 619/19 is the case number in the divisional case).
- II. The opposition against the patent was based on the grounds of lack of novelty and inventive step (Article 100(a) EPC), and lack of sufficient disclosure of the invention (Article 100(b) EPC).
- III. The Opposition Division held that the patent in amended form on the basis of the first auxiliary request met the requirements of the EPC.
- IV. Appeals against this decision were filed by both the proprietor and the opponent.
- V. The proprietor requests that the decision under appeal be set aside and amended such that the patent be maintained on the basis of a main request (which had been submitted as auxiliary request 7 on 15 September 2016; further former auxiliary requests had all been withdrawn in the course of the appeal proceedings).
- VI. The opponent requests that the decision under appeal be set aside and amended such that the patent revoked.

VII. Claim 1 of the main request reads (reference signs omitted; feature labeling by the Board):

*(a) Imager type image capturing device, comprising:*

*- (b) 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,*

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

*- (d) wherein the light sources are individually drivable and each light source is adapted to illuminate an area of a size much smaller than the size of said region framed by the sensor,*

*- (e) wherein the illumination axis does not coincide with the reception axis, and*

*- (f) further comprising a driver of the light*

*sources adapted to drive the light sources so as to switch off at least the light sources that illuminate outside of the boundary of the region framed by the sensor on the substrate at said at least one reading distance, and so as to switch on, in an illumination mode, the light sources that illuminate said boundary and the light sources that illuminate within said boundary.*

VIII. The following document is relevant to this decision:

O5: US 2001/0035489 A1

### **Reasons for the Decision**

*The patent, background*

1. The patent relates to an optical reader. The reader is for capturing an image on the 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 defines 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. This area is called in claim 1 of the main request 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 so that the direction of light propagating from the light source is different from the optical reception axis (Z). This way of illumination is expressed in claim 1 by defining an *optical 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.

*Claim 1, Article 123(2) EPC*

2. During the appeal proceedings, the opponent raised objections against claim 1 of - then - auxiliary request 7 of added subject-matter (Article 123(2) EPC), and of a lack of sufficiency of disclosure (Article 83/100(b) EPC) caused by the definition of light sources that illuminate the boundary, light sources that illuminate within said boundary, and light sources that illuminate outside of the boundary.
3. In this context, the opponent argued that, from page 29 of the originally filed application, only the switching on of a part of the light sources within a perimeter 20 could be directly and unambiguously derived, and it could not be derived from that passage that light sources at or within the corresponding boundary could be switched on.
4. Claim 1 is based on claim 1 as granted and further includes a definition of the grouping of the light

sources into groups illuminating inside, at, or outside of the boundary (feature (c), see point VII, above), and a feature defining the driver as being adapted to switch on the light sources that illuminate the boundary and the light sources that illuminate within the boundary in an illumination mode.

5. A basis for these features is present in the application as filed, page 29, second paragraph (corresponding to paragraph 143 of the patent in suit). This paragraph defines the groups of light sources in terms of their location in relation to the "perimeter". There is apparently no difference in substance to this passage by using the wording "boundary of the region framed by the sensor" in claim 1, as this is only to align the wording of the feature added in claim 1 to the wording already existing in the claim. It does not define matter different from that disclosed at page 29 of the application as filed.
  
6. In conclusion, claim 1 does not contravene Article 123(2) EPC.

*Claim 1, Article 83 EPC*

7. As regards the objection of insufficiency of disclosure, the opponent argued that the patent did not disclose how, exactly, the corresponding boundary of the area 16, 16<sub>1</sub>, 16<sub>2</sub> was defined, in particular in dependence on different distances D, D<sub>1</sub>, D<sub>2</sub>. It was completely unclear and, therefore, not sufficiently clearly and completely disclosed in which case the light sources illuminated an area within, or outside the boundary.

8. The Board does not agree. The light elements are defined as each illuminating an area of a size much smaller than the size of the region framed by the sensor. By switching each light element individually on and off, and detecting the illuminated area by the image reader, it can be easily determined by experiment whether the area illuminated by a particular light element is completely, partially, or not at all detected by the image sensor. This allows to assign each light source to one of the groups defined in claim 1. This experimental check is equally feasible for each reading distance of the reader and, therefore, sufficient to permit an assignment of the light elements for the entire working space at each reading distance of the image reader.
  
9. The invention is sufficiently clearly and completely disclosed; therefore, the ground for opposition mentioned in Article 100(b) EPC does not prejudice the maintenance of the patent.

*Claim 1, patentability (inventive step)*

10. The sole outstanding objection to claim 1 is whether its subject-matter is rendered obvious having regard to O5.
  
11. O5 discloses an image capturing device which has a camera (55) and an illumination device for illuminating the scene to be imaged. Fig. 6 of O5 shows the arrangement of these components in relation to light propagating from the illuminating device to the scene and further to the camera:

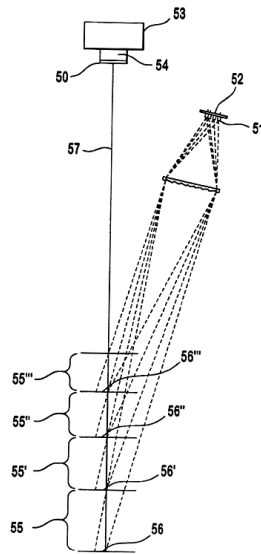


FIG. 6

12. The camera comprises a linear array sensor of photosensitive elements (05, 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. With the sensor optics, and the area of the sensor, a region of the scene is defined which can be imaged by the image reader. This region is essentially congruent to the image reader, i.e. a long, narrow strip that corresponds to the geometry of the line sensor (see 05, Fig. 3).

The illumination device consists of a set of juxtaposed linear arrays of light sources (51, Fig. 6) and a lens (41) which converges the light from the illumination device to an area of the scene. The skilled person would have understood from Fig. 6 that one or more of the arrays is switched on so that it illuminates a region about the narrow strip. The illumination device is configured to power on or off a selected linear

array of light sources depending on the distance of the scene from the image sensor. The skilled reader would have understood the arrangement in Fig. 6 of O5 operating 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 which are arranged next to each other as shown in O5, Fig 4. As the light of a single array is focused by the optical lens to a corresponding depth of field (O5, paragraph 27), the skilled reader would have understood that the focused light illuminates an area smaller than the area imaged by the image reader. Within its associated depth of field, the array illuminates a strip which is left adjacent to the optical axis at the furthest reading range (e.g. strip 56 at the lower end of depth of field 55 is illuminated by the most left linear array in Fig. 6) and right adjacent to the optical axis at the nearest reading distance.

13. O5 does not disclose the following features:

- the light sources are individually drivable,
- the array of light sources includes light sources that illuminate the boundary of the region framed by the sensor on the substrate at the at least one reading distance, light sources that illuminate within the boundary and light sources that illuminate outside the boundary, and
- the driver is adapted to switch off the light sources that illuminate outside the boundary of the region framed by the sensor on the substrate and to switch on, in an illumination mode, the light

sources that illuminate the boundary and the light sources that illuminate within the boundary.

14. The effect achieved by the image reader as claimed is that illumination of the area imaged by the image reader can be adapted to exactly match the field of view seen by the image reader such that area portions outside the field of view are not illuminated. This results in an optimisation of illumination. The technical problem starting from O5 can therefore be seen to optimise the illumination of the scene.
15. The skilled person would not have received any hint to the claimed reader by O5. Even though, as submitted by the opponent, O5 mentions that LEDs may be individually controlled (paragraph 5), this statement is rather general and does not teach the skilled person to provide an individual control to the LEDs so as to obtain an illumination scheme as defined in claim 1.
16. To conclude, the reader of claim 1 is not rendered obvious having regard to O5. Thus, the grounds for opposition pursuant to Article 100(a) EPC do not prejudice the maintenance of the patent.

## Order

### For these reasons it is decided that:

1.The decision under appeal is set aside.

2.The case is remitted to the Opposition Division with the order to maintain the patent on the basis of the main request, submitted as auxiliary request 7 on 15 September 2016, and the description to be adapted.

The Registrar:

The Chair:



D. Meyfarth

R. Winkelhofer

Decision electronically authenticated