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**Datasheet for the decision  
of 10 February 2009**

**Case Number:** T 0713/06 - 3.2.04

**Application Number:** 97951413.0

**Publication Number:** 0975211

**IPC:** A01J 5/017

**Language of the proceedings:** EN

**Title of invention:**

Apparatus and method for recognising and determining the position of a part of an animal

**Patentee:**

DeLaval Holding AB

**Opponent:**

Octrooibureau Van der Lely N.V.

**Headword:**

Image processing/DELAVAL

**Relevant legal provisions:**

EPC Art. 123  
RPBA Art. 13(1)

**Relevant legal provisions (EPC 1973):**

EPC Art. 56

**Keyword:**

"Inventive step (yes)"  
"New documents filed during oral proceedings (not admitted)"

**Decisions cited:**

-

**Catchword:**

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Case Number: T 0713/06 - 3.2.04

**DECISION**  
of the Technical Board of Appeal 3.2.04  
of 10 February 2009

**Appellant:** Octrooibureau Van der Lely N.V.  
(Opponent) Weverskade 110  
NL-3147 PA Maasluis (NL)

**Representative:** Corten, Maurice Jean F.M.  
Octrooibureau Van der Lely N.V.  
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**Respondent:** DeLaval Holding AB  
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**Representative:** Amery, Marcus James  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 16 March 2006  
rejecting the opposition filed against European  
patent No. 0975211 pursuant to Article 102(2)  
EPC.

**Composition of the Board:**

**Chairman:** M. Ceyte  
**Members:** P. Petti  
T. Bokor

## **Summary of Facts and Submissions**

- I. The opposition division by its decision dated 16 March 2006 rejected the opposition filed against the European patent No. 0 975 211.
- II. On 10 May 2006 the opponent (hereinafter appellant) lodged an appeal against this decision and simultaneously paid the appeal fee. A statement setting out the grounds of appeal was received on 17 July 2006.
- III. Oral proceedings took place on 10 February 2009 before the board of appeal.

During the oral proceedings the appellant submitted document EP-A-647 393 (D11) and the patent proprietor (hereinafter respondent) filed an amended third auxiliary request replacing a previously filed auxiliary request and withdrew its former main request to maintain the patent as granted.

- IV. The appellant requested that the decision under appeal be set aside and the patent be revoked.
- V. The respondent requested that the decision under appeal be set aside and the patent be maintained on the basis of claims 1 to 65 filed as "First auxiliary request" with letter dated 27 March 2007 (main request), or in the alternative on the basis of the second auxiliary request filed with letter dated 9 January 2009 or alternatively on the basis of the third auxiliary request filed during the oral proceedings before the board.

Claims 1 and 39 of the main request read as follows:

"An apparatus for recognising and determining the position of at least one part of an animal, wherein the apparatus comprises a source (10; 31) of structured light (12) for illuminating a region expected to contain said at least one part characterized in that an object illuminated by said light (12) simultaneously or discrete in time is partitioned into at least two illuminated areas (52<sub>1</sub>, 52<sub>2</sub>; 62<sub>1</sub>, 62<sub>2</sub>) where each two illuminated areas, (52<sub>1</sub>, 52<sub>2</sub>; 62<sub>1</sub>, 62<sub>2</sub>) are separated by a not illuminated area (56<sub>1</sub>), an image capture means (17; 32) arranged to capture at least one image and provide an image signal, the apparatus further comprising an image signal processing means (35) to respond to said captured image signal and a control means (39) to determine if the illuminated object is said part by comparing the image of the illuminated object to reference criteria defining different objects, and if said illuminated object is established to be said part of the animal, the position thereof is established, an animal related device (15; 40; 42, 44) and means to guide the animal related device (15; 40; 42; 44) towards the determined position of said part, wherein said at least one image captured by said image capture means (17; 32) is formed by said light (12), and wherein the source (10; 31) of structured light is a light emitting device (10; 31), and in that each area of said at least two illuminated areas (52<sub>1</sub>, 52<sub>2</sub>; 62<sub>1</sub>, 62<sub>2</sub>) is in the form of a line or a dot and the number of lines or dots is such that the control means is allowed to identify the illuminated object, and wherein the control means (39) groups together said lines or dots into different groups in dependence of the position in

a plane for each line or dot and the length in said plane for each line or dots in said plane."

"A method for recognising and determining the position of at least one part of an animal, which method is characterized by the following steps:

- illuminating with structured light a region expected to contain said at least one part in such a way that an object illuminated by said light simultaneously or discrete in time is partitioned into at least two illuminated areas, where each two illuminated areas are separated by a not illuminated area
- capturing at least one image and provide an image signal,
- processing said image signals to determine if the illuminated object is said part by comparing the image of the illuminated object to reference criteria defining different objects, and if said illuminated object is established to be said part of the animal, the position thereof is established, and
- providing information for guiding an animal related device towards the determined position of said part, said method further including capturing at least one image formed by said light;
- illuminating said object with at least one light emitting beam, wherein each of said at least two illuminated areas is in the form of a line or a dot, and
- where the number of lines or dots is such that it allow for identifying the illuminated objects, and

- grouping together said lines or dots into different groups in dependence of the position in a plane for each line or dot, and the length in said plane for each line or dots in said plane."

VI. The appellant essentially submitted in writing that the claimed subject-matter of the main request did not involve an inventive step starting from document EP-A-306 579 (D3) and combining it with documents US-A-5 546 475 (D10) or DE-A-4 113 700 (D1).

During the oral proceedings the appellant essentially submitted that the claimed subject-matter did not involve an inventive step starting from D11 and combining it with D10.

VII. The respondent contested the appellant's arguments.

### **Reasons for the Decision**

1. The appeal is admissible.
2. *Amendments (main request)*

Claim 1 of the main request is a combination of granted claims 1, 2, 3 and 24, which correspond in essence to claims 1, 2 and 23 of the application as filed.

Claim 39 is a combination of granted claims 42, 43, 44 and 58, which correspond in essence to claims 41, 42 and 56 of the application as filed.

The further amendments concern the adaptation of the dependent claims and of the description to the amended independent claims 1 and 39.

2.1 The board is satisfied that the amendments do not contravene the requirements of Article 123 EPC.

3. *Documents D11 and D4*

3.1 During oral proceedings, the appellant filed document D11 and essentially submitted the following arguments:

- D11 does not introduce new facts into the proceedings, because it is cited in the patent specification (see paragraph [0006], in column 2).
- Starting from D11 the skilled person in view of D10 would arrive at the claimed subject-matter without exercising any inventive skill. Thus, D11 is highly relevant for the assessment of inventive step.

The appellant also cited document EP-A-360 354 (D4), which is referred to in the decision under appeal. In this respect, he asserted that D4 discloses an apparatus similar to that described in D11, and that the same submissions of lack of inventive step based on D11 could also be made on the basis of D4.

3.2 In this respect, the respondent essentially submitted that D11 was not relevant, particularly because this document relates to an apparatus and method for recognizing and determining the position of the teat on the basis of historical data of the animal and does not refer to image processing.

He also asked the board for an interruption of the oral proceedings in order to analyse D11 more carefully, if the board were to be arrived at the conclusion that the appellant's submissions based upon D11 would be decisive for the examination of inventive step.

3.3 Documents D11 and D4 were submitted after the appellant had filed its ground of appeal. Under Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA) it is at the Board's discretion to admit and consider these submissions in the appeal proceedings.

3.4 D11 discloses an apparatus for recognizing and determining the position of at least one part of an animal, the apparatus comprising

- a sensor (51) including a source of structured light ("transmitting element" 62) for illuminating a region expected to contains said at least one part of the animal, wherein an object is illuminated by said light "discrete in time", the source of structured light being a light emitting device providing a narrow laser beam capable of performing a scanning movement so as to move across the object and of determining the position of the object in a horizontal plane, and a receiver element (66) including a diode detector arranged to provide a signal which is determined by the distance (d) from the sensor (51) to the object and the angles ( $\alpha_1$ ,  $\alpha_2$ ) which indicate the initial angle and the final angle, respectively of the laser beam moving across the object,

- a control means for calculating on the basis of the values  $d$ ,  $\alpha_1$  and  $\alpha_2$  the position of said object and for comparing the calculated position of said object with a reference position in order to determine if the illuminated object is said part,
- an animal related device and means to guide the animal related device towards the determined position of said part.

The apparatus and the method of D11 neither do disclose features (a) to (c) or (a') to (c'), respectively, nor relate to an image capturing means arranged to capture at least one image and provide an image signal.

Therefore, having regard to the consideration below, D11 is less relevant than D3 so that the admission of D11 would not lead to a different decision on inventive step. The same applies for D4.

Therefore, the board has not admitted these documents into the proceedings.

#### 4. *Inventive step (main request)*

4.1 The appellant submitted in writing that document D3 represented the closest prior art. This citation discloses (see column 12, line 1 to column 13, line 56; Figures 1 to 3 and 9) an apparatus for recognizing and determining the position of at least one part of an animal, the apparatus comprising

- a source of structured light (laser source 102) for illuminating a region expected to contains said at

- least one part, wherein an object is illuminated by said light "discrete in time",
- the source of structured light being a light emitting device illuminating an area of the object,
  - an image capturing means (camera 110) arranged to capture at least one image and provide an image signal,
  - said at least one image captured by said image capture means being formed by said light,
  - an image processing means (120) to respond to said captured image signal,
  - a control means for calculating the position of said object and for comparing the calculated position of said object with a reference position in order to determine if the illuminated object is said part (see particularly column 13, lines 27 to 33),
  - an animal related device,
  - and means to guide the animal related device towards the determined position of said part.

D3 also discloses (see column 12, line 1 to column 13, line 56; Figures 1 to 3 and 9) a method for recognizing and determining the position of at least one part of an animal, comprising the following steps:

- illuminating with structured light a region expected to contain said at least one part in such a way that an object illuminated by said light "discrete in time", the source of structured light being a light emitting device illuminating an area of the object
- capturing at least one image formed by said light and provide image signals,

- processing said image signals in order to calculate the position of said object,
- comparing the calculated position of said object with a reference (historical) position of said part of the animal in order to determine if the illuminated object is said part (see particularly column 13, lines 27 to 33),
- providing information for guiding an animal related device towards the determined position of said part.

4.1.1 The source of structured light of D3 provides a substantially horizontal light plane (or light fan) which can perform a scanning movement in a substantially vertical plane. However, D3 is silent as to whether the object is illuminated so as to be partitioned into illuminated areas which are separated by a non-illuminated area.

4.2 The apparatus according to claim 1 differs from this prior art in that

- (a) the illuminated object is partitioned into at least two illuminated areas in the form of a line, where each two illuminated areas are separated by a not illuminated area,
- (b) the control means groups together said lines into different groups in dependence of the position in a plane for each line and the length in said plane for each line in said plane,
- (c) the control means determines if the illuminated object is said part of the animal by comparing the

image of the illuminated object to reference criteria defining different objects.

The method of claim 39 differs from this prior art by the following steps:

- (a') illuminating said region in such a way that an object is partitioned into at least two illuminated areas in the form of a line, where each two illuminated areas are separated by a not illuminated area,
- (b') grouping together said lines into different groups in dependence of the position in a plane for each line and the length in said plane for each line in said plane,
- (c') processing the image signals to determine if the illuminated object is said part of the animal by comparing the image of the illuminated object to reference criteria defining different objects.

4.3 The distinguishing features (a) to (c) (or (a') to (c')) allow the identification of the object as a part of an animal without requiring the use of historical data concerning said animal, and at same time the capture of the image of a partially illuminated object reduces the volume of image information which has to be processed and thus increases the speed of the recognising process of a part of the animal and of the determination of the position of the part.

Thus, starting from D3 as closest prior art, the objective problem to be solved may be seen in providing

a reliable and simple method/apparatus for performing recognition and position determination of a part of an animal without the use of historical data (see patent specification, column 2, lines 51 to 54) and also without unduly burdensome computation requirements.

D3 cannot lead a skilled person to the claimed invention since this citation teaches to use historical teat position data in order to reduce the computation required in order to identify the teats within an image (column 5, lines 19 to 28; column 13, lines 27 to 33).

- 4.4 Document D10 relates to a technique of recognizing objects using image processing systems. In particular, according to column 1, lines 14 to 22, it is well known to compare an histogram developed from an image representing a target object which was totally illuminated to histograms of reference images in order to recognize the target object. In other words, the technique of processing image signals to recognize an illuminated object by comparing the image of the illuminated object to reference criteria defining different objects - as defined by feature (c) or (c') - is known from D10.

However, D10 does not relate to determinations made in respect of animals - but only in respect of inanimate objects. There is no disclosure or suggestion of the advantages which can be achieved by comparing the image of the illuminated object to reference criteria defining different objects in a method of recognizing a part of an animal.

In particular, D10 discloses a system of recognizing objects, such as fruits, which after having been recognized a first time are sold and do not need to be recognized a second time. Thus, the use of historical data concerning the object would be meaningless in a system of the type referred to in D10. Therefore, the skilled person confronted with the problem of providing a reliable and simple method/apparatus for performing recognition and position determination of a part of an animal without the use of historical data and also without unduly burdensome computation requirements would not have considered D10 since this citation does not teach or suggest any way to deal with this technical problem.

Moreover, D10 explicitly teaches a full and complete illumination of the object to be recognized, there being not even a hint to provide partial illumination of the object at two separate areas in the form of a line and having a non-illuminated area separating the two illuminated areas.

Therefore, even if the skilled person were to combine D10 with D3, he would not arrive at the claimed subject-matter. The same applies if the skilled person starting from D3 would have considered the use of reference data as a matter of course, based on his general knowledge.

- 4.5 In the Statement of the Grounds of Appeal, the appellant also submitted that the claimed subject-matter lacked inventive step in view of the combination of D3 with D1.

With regard to D1, the board in its communication dated 25 September 2008 indicated that one of the issues to be dealt with was that of whether this document taught to compare the image of an illuminated object to reference criteria defining different objects.

In this respect, the respondent asserted that D1 did not disclose such a comparison but concerned a recognition system using the historical data of the animals. These assertions were not contested by the appellant.

4.6 From the foregoing the board is satisfied that D1 does not address the problem to be solved by the claimed invention and that there is no disclosure or suggestion in this citation of comparing the image of the illuminated object to reference criteria defining different objects as defined by feature (c) or (c'). Therefore, the same reasons given for the combination of D3 with D10 also apply for the combination of D3 with D1.

4.7 For these reasons, the subject-matter of claim 1 as well as that of claim 39 involves an inventive step (Article 56 EPC, 1973) over D3 in combination with D10 or D1.

## **Order**

### **For these reasons it is decided that:**

The decision under appeal is set aside.

The case is remitted to the department of first instance with the order to maintain the patent on the basis of the following documents:

Description: columns 1-8 filed during oral proceedings and columns 9-17 of the patent specification.

Claims: 1-65 filed as first auxiliary request with letter dated 27 March 2007.

Drawings: figures 1-17 of the patent specification.

The Registrar:

The Chairman:

G. Magouliotis

M. Ceyte