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Datasheet for the decision of 25 June 2009

Case Number: T 1889/06 - 3.2.04

Application Number: 00964862.7

Publication Number: 1211928

IPC: A01J 5/017

Language of the proceedings: EN

Title of invention:
An apparatus and a method for improving teatcup attachment, by using illuminating and image capturing means

Patentee:
DeLaval Holding AB

Opponent:
Octrooibureau Van der Lely N.V.

Headword:
Alternately adjusting/DELAVAL

Relevant legal provisions:
EPC Art. 54, 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Main request and first auxiliary request - inventive step (no)"
"Second auxiliary request not submitted in due time (inadmissible)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1889/06 **-** 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 25 June 2009

Appellant: (Opponent)	Octrooibureau Van der Lely N.V. Weverskade 110 NL-3147 PA Maassluis (NL)
Representative:	Seerden, Adrianus Maria Octrooibureau Van der Lely N.V. Weverskade 110 NL-3147 PA Maassluis (NL)
Respondent: (Patent Proprietor)	DeLaval Holding AB P.O. Box 39 SE-147 21 Tumba (SE)
Representative:	Gray, Helen Mary Albihns GmbH Bayerstrasse 83 D-80335 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted 3 November 2006 concerning maintenance of European patent No. 1211928 in amended form.**

Composition of the Board:

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

Summary of Facts and Submissions

I. In its interlocutory decision dated 3 November 2006, the opposition division found that, having regard to the amendments submitted by the patent proprietor, the European patent No. 1 211 928 met the requirements of the European Patent Convention.

II. The opponent (hereinafter appellant) lodged an appeal against this decision on 15 December 2006 and simultaneously paid the appeal fee. A statement setting out the grounds of appeal was received on 22 February 2007.

III. Oral proceedings before the board were held on 25 June 2009.

IV. The appellant requested that the decision under appeal be set aside and the patent be revoked.

V. The respondent (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained in amended form on the basis of claims 1 to 17 and amended description filed with letter dated 3 September 2007 (main request) or alternatively, that the decision under appeal be set aside and the patent be maintained according to claims 1 to 8 of the first auxiliary request or claim 1 of the second auxiliary request, both filed with letter dated 25 May 2009. During oral proceedings it was clarified that claim 1 of the first auxiliary request filed by letter dated 25 May 2009 included the same amendments as those made in the corresponding claim 10 of the main request.

Claim 1 of the main request reads as follows:

"1. An apparatus for determining the position in space of a teat (7), and in particular for determining the position in space of a teat tip (8), which is a teat end portion of a milking animal, comprising control means and a robot arm (2), movable in response to said control means, moving a support means (3) carrying at least one animal related means, such as a teatcup (5), said support means (3) being provided with an image capturing means (14), a first illuminating light source (10) illuminating a first discrete area (12) of the teat (7),

a second illuminating light source (11) adapted to illuminate a second discrete area (13) of the teat (7);

said control means being adapted to determine a position of the teat (7) based on information provided by illumination with the first illuminating light source (10), and to determine a position of the teat tip (8) based on information provided by illumination with the second illuminating light source (11); and

the support means (3) being adapted to move in response to the, by said control means, determined position of the teat tip (8), while attaching the animal related means, such as a teatcup (5), onto the teat (7);

characterised in that

the support means (3) is adapted to adjust its position in response to the control means by alternately using information provided by detection of illumination from the first

illuminating light source (10) and information provided by detection of illumination from the second illuminating light source (11)."

Claim 1 of the first auxiliary request, which is identical to claim 10 of the main request, reads as follows:

"1. A method for determining the position in space of a teat (7), and in particular for determining the position in space of a teat tip (8), which is a teat end portion of a milking animal, comprising control means and a robot arm (2), movable in response to said control means, moving a support means (3) carrying at least one animal related means, such as a teatcup (5), said support means (3) being provided with an image capturing means (14), a first illuminating light source (10) illuminating a first discrete area (12) of the teat (7),

illuminating a second discrete area (13) of the teat (7) with a second illuminating light source (11);

determining a position of the teat (7) based on information provided by illumination with the first illuminating light source (10), and determining a position of the teat tip (8) based on information provided by illumination with the second illuminating light source (11); and

moving the support means (3) in response to the, by said control means, determined teat tip (8) position, while attaching the animal related means, such as a teatcup (5), onto the teat (7);

characterised by the step of

adjusting the position of the support means (3) in response to the control means by alternately using information provided by detection of illumination from the first illuminating light source (10) and information provided by detection of illumination from the second illuminating light source (11)."

Claim 1 of the second auxiliary request reads as follows:

"1. A method for determining the position in space of one teat (7), and in particular for determining the position in space of one teat tip (8), which is a teat end portion of a milking animal, by means of control means and a robot arm (2), movable in response to said control means, moving a support means (3) carrying at least one animal related means, such as a teatcup (5), said support means (3) being provided with an image capturing means (14), a first illuminating light source (10) directed perpendicular to the vertical plane and towards an expected area of finding the teat for illuminating a first discrete area (12) of the teat (7) and a second illuminating light source inclined downwards with respect to the first illuminating light source towards an expected area of finding the teat tip for illuminating a second discrete area of the teat,

said method including the steps of

a) illuminating said first discrete area of the teat with said first illuminating light source and detecting said illumination with the image capturing means,

determining a position of the teat (7) based on information provided by illumination with the first

illuminating light source (10), and moving the support means such that said animal related means is centered under the first discrete area,

b) switching off said first illuminating light source and switching on said second illuminating light source to illuminate a second discrete area (13) of the teat (7),

c) detecting the illumination of the second discrete area with the image capturing means and lowering said support means;

adjusting the position of the support means (3) in response to the control means by repeating steps a) to c) in turn and thereby alternately using information provided by detection of illumination from the first illuminating light source (10) and information provided by detection of illumination from the second illuminating light source (11) until no illumination from the second illuminating light source is detected in step c), then

d) raising said support means and repeating steps a), b) and d) in turn until illumination from the second illuminating light source is again detected after step b),

determining a position of the teat tip (8) based on information provided by illumination with the second illuminating light source (11); and

moving the support means (3) in response to the, by said control means, determined teat tip (8) position, while attaching the at least one animal related means, such as a teatcup (5), onto the teat (7)."

VI. During oral proceedings the appellant essentially submitted that the subject-matter of claim 1 of the

main request as well as of the first auxiliary request either lacked novelty with respect to WO-A-98/44782 (D1) or did not involve an inventive step with regard to D1 and common general knowledge and that the second auxiliary request of the respondent was late filed and therefore inadmissible.

In writing the appellant had also submitted that claims 1 and 10 of the main request lacked novelty over EP-A-360 354 (D3) and WO-A-01/19171 (D4).

VII. The respondent essentially submitted that the subject-matter of claim 1 of main and first auxiliary requests was novel over D3, in so far as this document did not disclose the features of the characterising portion of the claims, and involved an inventive step in so far as the skilled person starting from D3 could not arrive at the claimed subject-matter. He also submitted that the second auxiliary request was not late filed since it was submitted in response to the board's communication dated 2 April 2009.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty (main and first auxiliary requests)*

It is not disputed that document D1 discloses an apparatus and a method for determining the spatial position of a teat of the kind stated in the pre-characterising portion of claim 1 of both requests.

2.1.1 In D1, firstly the teat is only illuminated by the first illuminating light source and a first illuminated area (line 50_1) is detected, whereafter the position of the teat is determined and the support means moves to guide the mouth (14) of the teat cup (15) towards the determined position of the teat (see Figures 16 and 15, left-hand image; page 23, lines 7 to 14 in conjunction with page 22, lines 33 to 36). Then, the teat tip is illuminated by the second illuminating light source, a second illuminated discrete area (line 50_2) is detected and the support means is further moved to guide the mouth of the teat cup towards the determined position of the teat tip (see Figures 16 and 15, left-hand image; page 23, lines 14 to 17 in conjunction with lines 1 to 6). Thus, the position of the support means is adjusted firstly by using information provided by detection of the first illuminated discrete area (adjustment A1) and then by using information provided by detection of the second illuminated discrete area (adjustment A2). In other words, there is a sequence A1-A2 of positional adjustments of the support means after which the teat cup can be connected to the teat.

Therefore, D1 does not disclose the feature that the position of the support means is adjusted by **alternately using** information provided by detection of illumination from the first illuminating light source and information provided by detection of illumination from the second illuminating light source.

In this respect, it has to be noted that in the context of claim 1 of main and first auxiliary requests the terms "by alternately using ..." imply not only that an adjustment A2 occurs after an adjustment A1 but also

that both adjustments A1-A2 are used more than once, i.e. at least in a sequence of adjustments A1-A2-A1-A2.

2.1.2 The appellant referred to two paragraphs on page 23, lines 7 to 17 and 18 to 26 in D1 which refer to Figures 16 and 17, respectively, each paragraph disclosing a sequence of adjustments A1-A2, and essentially submitted that the sequence referred to in the second paragraph (lines 18 to 26) occurs after the sequence referred to in the first paragraph, and thus D1 discloses a sequence A1-A2-A1-A2 which corresponds to the features specified in the characterising portions of claim 1 of main and first auxiliary request.

However, Figures 16 and 17 in D1 relate to two different situations which may occur when the apparatus shown in Figures 13 and 14 is used, without there being any temporal relationship between them. In other words, the sentence "the first plane 12_1 has moved upwards ..." (see page 23, lines 20 and 21; Figure 17) in the second paragraph does not mean that the movement of the plane 12_1 occurs after the movement described in the preceding paragraph.

2.2 Document D3 (see Figures 1, 2, 4 to 6) discloses a method of and an apparatus for determining the spatial position of a teat, comprising control means and a robot arm (6), movable in response to said control means, moving a support means (47) carrying teat cups (45 to 48), said support means (4) being provided with a diode detector (66) and a laser (62). The robot arm (6) with the laser (62) performs first a searching procedure, during which objects illuminated by the laser (62) can be identified as being teats, and a

tracking procedure, in which the teats are tracked individually in order to connect a teat cup thereto. During the searching procedure, the laser (62) illuminates a discrete area of an object and the diode detector (66) detects the image of this illuminated discrete area, whereafter the control means calculates the position of the object and compares the calculated position with stored teat position data, in order to recognize the object as being a teat. During the tracking procedure the robot arm carrying the laser and the teat cups starts from the position in which a teat was recognized during the searching procedure, wherein the laser illuminates a discrete area of the teat which is detected by diode detector (66) and the control means calculates the difference between the position of the teat relative to the laser and the position of the teat cup relative to the laser. If the calculated difference is less than a certain value the robot arm moves upwardly in order to connect the teat cup to the teat. During this upward movement the tracking procedure remains active such that further discrete areas of the teat can be illuminated. Thus, the position of the support means (47) is adjusted in response to the control means by using information provided by detection of different illuminated discrete areas of the teat. However, D3 does not disclose a series of positional adjustments made by alternately using information provided by a first illuminated discrete area (A1) and information provided by a second illuminated discrete area (A2), that is a sequence A1-A2-A1-A2.

2.3 Document D4 discloses (see Figures 1 and 9) a method of and an apparatus for determining the spatial position

of a teat, comprising control means and a robot arm (6), movable in response to said control means, moving a support means carrying a teat cup (5), said support means being provided with a sensor (4) comprising two transceivers (P and Q) which alternately acts as first and second illuminating light sources (transmitters) and image capturing means (receivers). The first illuminating light source (P) illuminates a first discrete area of the teat (in a horizontal plane), while the second illuminating light source (Q) illuminates a second discrete area of the teat (in the same horizontal plane). Although the two light sources (P and Q) may operate shortly after one another, the position of the teat is determined by using combined information provided by detection of both illuminated discrete areas of the teat (see particularly page 8, lines 19 to 24). Thus, D4 does not disclose the feature concerning the adjustment of position of the support means "by alternating using information ...", as defined in claims 1 and 10 of the main request.

2.4 Therefore, the subject-matter of claim 1 of the main request as well as that of claim 1 of the first auxiliary request are novel over each of D1, D3 and D4.

3. *Inventive step (main and first auxiliary requests)*

3.1 The subject-matter of claim 1 of the main request differs from the apparatus disclosed in D1 in that

(i) "the support means (3) is adapted to adjust its position in response to the control means by alternately using information provided by detection of illumination from the first

illuminating light source (10) and information provided by detection of illumination from the second illuminating light source (11).

The subject-matter of claim 1 of the first auxiliary request differs from the method discloses in D1 by the following step, which corresponds to feature (i) above:

(ii) "adjusting the position of the support means (3) in response to the control means by alternately using provided by detection of illumination from the first illuminating light source (10) and information provided by detection of illumination from the second illuminating light source (11)".

3.2 In D1, after detection of the first discrete illuminated area (50_1) of the teat, the support means is positioned under this detected discrete area by using information provided by detection of illumination from the first illuminating light source (10_1), whereafter a second illuminated discrete area (50_2) of the teat tip is also detected, the position of the teat tip is determined and the position of the support means is adjusted by using the information from this second discrete area in order to connect the teat cup to the teat of the animal. Since after the determination of the position of the teat tip the animal can move, even abruptly, it can happen that the previously determined positions of both illuminated discrete areas of the teat no longer correspond to the position of the teat and thus the teat cup is not correctly connected to the teat. D1 is silent as to what has to be done if a teat cup is not correctly attached.

Thus, starting from D1 as closest prior art the technical problem underlying the invention as defined in claim 1 of the main request or in claim 1 of the first auxiliary request may be formulated as how to enhance the correct teat cup attachment rate and hence the reliability and efficiency of the automated milking equipment (see in particular paragraph [0035] of the patent specification).

In order to solve this problem it would be obvious for the skilled person to repeat the previous steps of sequentially detecting first and second discrete areas, determining their respective positions and adjusting the support means firstly by using the information relating to first detected discrete area and then by using the information relating to second detected discrete area. By doing so, the position of the support means would be adjusted according to a sequence A1-A2-A1-A2. Therefore, the skilled person would arrive in an obvious way at an apparatus comprising feature (i) and at a method comprising step (ii).

3.3 In this respect, the respondent essentially submitted the following arguments:

– In the embodiment represented in Figure 14 of D1, the light plane emitted by the second illuminating light source 12_2 "passes a small distance d above the mouth 14 of the teat cup 15", wherein "one example of d is 8,5 mm" (see page 22, lines 14 to 18). This ensures a precise detection of the discrete area illuminated by the second light source. Thus, the positioning of the support means on the basis of the information of detection of

illumination from the second light source (adjustment A2) is the final step of the teat tracking procedure disclosed in D1. Therefore, starting from D1, there is neither a need nor an incentive to move down the support means in order to repeat the sequence of adjustments A1 and A2.

– In D1 the sequence of adjustments A1-A2 is preceded by a teat searching procedure (TSP). Starting from D1, the skilled person - in order to improve the correct teat cup attachment rate - would repeat not only the sequence of adjustments A1-A2 but also the teat searching procedure (TSP) and arrive at a sequence of adjustments of the type A1-A2-TS-A1-A2, which is not covered by the respective claim 1 of main and first auxiliary requests.

However, the respondent's arguments do not take into consideration the possibility that the animal may move abruptly after the detection of the second illuminated area. If the animal moves there is need to repeat the sequence A1-A2, when seeking to improve the success rate of the teat cup attachment. It would lead to a further more precise positional adjustment of the support means carrying the teat cups. The skilled person is aware that after a first sequence of adjustments A1-A2, the position of the animal may change, so that the previously determined position of the teat no longer corresponds to the new position of the teat. Thus, the skilled person would realize that a further sequence of adjustments A1 and A2 is needed. The skilled person - instead of immediately repeating the sequence A1-A2 - could also choose to restart from

the beginning so as to arrive at the resulting sequence A1-A2-TSP-A1-A2. In that case, the first sequence A1-A2 would be no longer taken into consideration for determining the position of the teat tip. However, he would immediately realize that a sequence of adjustments A1-A2-A1-A2 leads to a more precise determination of the position of the teat tip. Furthermore, it has to be noted that claim 1 of the main request and claim 1 of the first auxiliary request do not clearly exclude that between a first sequence of adjustments A1-A2 and the successive sequence other steps are carried out.

3.4 The claimed process and apparatus amount to no more than the mere optimisation of the method and apparatus of D1, in which the precision of the positional adjustment is enhanced just by repeating the sequence A1-A2. The skilled person would thus arrive at step i) or ii) defined in the characterising portion of claim 1 without exercising any inventive skill. In conclusion the board finds that the subject-matter of claim 1 according to the main request or the auxiliary request does not involve an inventive step. The main request and the first auxiliary request are therefore not allowable.

4. *Second auxiliary request (admissibility)*

This request includes one claim based on method claims 10 and 11. In addition to the features of these claims, the claimed method includes steps disclosed in the description, more specifically the steps of the flow chart of Figure 5 as discussed on page 9, lines 18

to 30 and page 10, lines 7-17 of the published application.

The second auxiliary request was filed within the one-month time limit set in the Board's communication in preparation for the oral proceedings.

Article 12(2) of the Rules of Procedure of the Boards of Appeal (RPBA) stipulates that the grounds of appeal and the reply must contain a party's complete case. Under Article 13(1) RPBA it is at the Board's discretion to admit and consider any amendment to a party's case after it has filed the grounds of appeal or the reply.

However, submissions made after the grounds of appeal or the reply have been filed cannot in principle be rejected as late filed, if they have been prompted by the Board's communication or by the submissions of the other party which may have been admitted into the proceedings.

In the present case, the Board is unable to follow the respondent's submission that the amendments leading to the second auxiliary request were a reaction to the Board's Communication:

Point 1 of the Communication merely states the requests of the parties. In point 2 the Board interprets the wording "alternatively using the information from the first and second light sources" as meaning that each information form the first light source follows and is succeeded by the other information from the second light source in the following sequence A1-A2-A1-A2.

This corresponds to the respondent's own interpretation of this feature. The Board also notes that according to the diagram of Figure 5 of the patent specification sequences other than A1-A2-A1-A2 appear to be possible.

Point 3 lists the issues to be dealt with during the oral proceedings. These issues, lack of novelty or inventive step, were raised in the grounds of appeal.

Thus no new matter was raised in the Board's communication which could have justified the late filing of this second auxiliary request. This auxiliary request should therefore have been filed together with the respondent's reply as required by Article 12(2) RPBA.

Furthermore, the respondent did not provide any proper justification for the late submission of the second auxiliary request.

In opposition appeal proceedings an opponent should namely be prepared to be confronted with an amended claim 1 derived from the claims as granted. However at this late stage of the proceedings it could not be expected from the opponent to deal with a substantially amended claim 1 based on method claims 10 and 11 and including some steps of the flow chart of Figure 5. Therefore admitting the second auxiliary request would have been contrary to the principle of procedural fairness, since it would have been difficult for the opponent to deal properly with it.

This amended claim 1 also gives rise to a rather complex problem of added subject-matter under

Article 123(2) EPC since only one part of the steps disclosed in combination in the flow chart of Figure 5 has been introduced into claim 1. This also means that this auxiliary request was not prima facie allowable under Article 123(2) EPC.

For all these reasons, the Board decided to reject the second auxiliary on the ground of being late filed.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

G. Magouliotis M. Ceyte