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Datasheet for the decision of 15 April 2011

Case Number: T 0420/09 - 3.2.04

Application Number: 00102756.4

Publication Number: 1123648

IPC: A01B 59/06

Language of the proceedings: EN

Title of invention:
System for fully automatic dosage in agricultural machinery

Patentee:
A.P. Laursen A/S

Opponent:
Amazonen-Werke H. Dreyer GmbH & Co. KG

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Novelty (no)"

Decisions cited:
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Catchword:
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Case Number: T 0420/09 **-** 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 15 April 2011

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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 19 December 2008 concerning maintenance of the European patent No. 1123648 in amended form.**

Composition of the Board:

Chairman: M. Ceyte
Members: A. de Vries
C. Heath

Summary of Facts and Submissions

I. The Appellant (Opponent) lodged an appeal, received 12 February 2009, against an interlocutory decision of the Opposition Division posted 19 December 2008 to reject the opposition against European patent No. 1 123 648 and simultaneously paid the appeal fee. The statement of the grounds of appeal was received 28 April 2009.

II. The opposition had been filed against the patent as a whole based among others on Article 52(1) in combination with Article 54 for lack of novelty.

The Opposition Division held that the patent as granted had been amended so as to add subject-matter, Article 123(2). However, taking into consideration amendments made to the patent according to a first auxiliary request it found that the patent met all requirements of the EPC. It considered the following prior art document inter alia in arriving at its findings:
E1: EP-A-0 537 857.

III. Oral proceedings were duly scheduled to be held before the Board on the 1 March 2011. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal and annexed to the summons the Board made preliminary observations among others regarding novelty and inventive step with respect to E1. With letter of 4 February 2011 the Proprietor informed the Board it would not be attending or be represented at the oral proceedings. These were subsequently cancelled.

IV. The Appellant requests that the decision under appeal be set aside and the patent be revoked in its entirety.

The Respondent (Proprietor) requests that the appeal be dismissed.

V. The wording of claim 1 as maintained in amended form is as follows:

"System for fully automatic dosage of granular or powdery material, such as a fertiliser, in agricultural machinery, said system comprising a supply container (2) supported on a first rigid frame (3), which is connected resiliently to a second rigid frame (6) attached to said machinery, so that said first rigid frame (3) can only be displaced substantially translatory and parallel to said second rigid frame (6), said supply container (2) being provided with an outlet (7), which via one or more controllable valve(s) (8) is communicating with a spreading device (10) for spreading said material on the ground, where said dosage being automatically and continuously adjusted during operation of said machinery based on the amount of material present in the hopper (supply container (2)), which amount is determined solely by the output signal (16) provided by a displacement sensitive means (5), said output signal (16) being only a function of the translatory and parallel displacement of said first rigid frame (3) relative to said second rigid frame (6); where said automatic adjustment of the dosage is being continuously performed during operation with the aid of said controllable valve(s) (8), said valve(s) (8) being provided with a processed output signal (15) derived from an output signal (16) from said displacement

sensitive means (5), wherein the system comprises a processor (12) for deriving said processed signal (15) based on the output signal (16) from the displacement sensitive means (5); whereby said processed output signal (15) is a function of the difference between the actual change of mass of the material in said supply container (2) over a specific time interval and a target change of said mass over said specific time interval."

VI. The Appellant argued as follows:

Novelty depends on the exact interpretation of the claim.

It makes no difference when comparing E1 with claim 1 that in E1 the supply container 2 and supporting frame 1 is coupled to the outer trestle 18 via coupling elements 9,10,10A and 12. These elements together form a frame which in use is rigid. This allows the weight of the container contents to be measured by measuring the translation between the outer 18 and the inner trestle 19 via the single weight cell 23. Claim 1 in any case does not exclude further elements between the rigid frame and the container.

In the weight measurement variations due to uneven terrain are filtered out without the use of a further sensor, as in the present patent. An inclinometer output corrects for slopes, but on even ground only the output from sensor 23 is used to adjust the flow rate. Claim 1 thus lacks novelty.

VII. The Respondent argued as follows:

In claim 1 hopper amount is determined *solely* by the output signal of the displacement sensitive means, i.e. the weighing cell, meaning no further cells such as reference or weight correction cells are used. The term "solely" is used to distinguish from prior art spreaders that use one or more reference cells to correct for effects caused by travel over uneven terrain. In the present invention there are no sensors for angle correction.

In E1 this is not the case, as inclinometer 65 is always present as weight correction determining sensor. It is a necessary part of E1 to maintain high accuracy even when moving up steep slopes. There is no suggestion in E1 to leave it out, so that the system of claim 1 is novel over this prior art. The mere fact that no weight correction is performed on even ground does not suggest that it can be left out entirely. The control system in E1 also does not, strictly speaking, allow continuous adjustment or control, but only adjustment when the difference between mass changes exceed a threshold value. Continuous control requires arbitrarily small changes in output in response to arbitrarily small changes in input. The broken jumps in E1 at threshold indicate a discontinuous control.

Reasons for the Decision

1. The appeal is admissible.

2. *Background*

The patent concerns an automatic dosage system for granules/powder in agricultural machinery, such as e.g. spreaders. It comprises, see e.g. its sole figure, a supply container or hopper 2 with an outlet 7 and at least one controllable valve 8 communicating with a spreader 10. The container is supported on a first frame 3 resiliently connected to a second frame 6 so as to allow only parallel displacement. A sensor 4 senses the displacement between the frames as a measure of weight of the material amount in the hopper. Dosage is automatically and continuously adjusted in response to the output signal from sensor 4. Thus, the actual (measured) change of mass over a given time interval is determined and combined with a target value to develop an error signal which is used to adjust dosage from the dosage unit.

The patent focuses in particular on corrections that need to made for the effect on the measurement of accelerations due to travel over uneven terrain. Conventional systems use a reference weighing cell with a reference weight, see specification paragraph [0002], but the use of more than one weighing cell is considered disadvantageous, specification paragraph [0003]. The following paragraph [0004] formulates the main object of the invention accordingly as "[how] to provide a system comprising only one weighing cell and no reference cell".

3. *Novelty*

3.1 E1 indisputably concerns a similar agricultural spreader system with fully automatic dosage. Its main features are readily apparent from figure 1 and 10 and the corresponding parts of the description.

These include a ***supply container*** or hopper 2 coupled to an intermediate trestle 11 which is hitched onto a tractor 17. The trestle consists of an outer 18 and an inner trestle 19 that are ***resiliently connected*** to each other via leaf springs 38 (see figures 3 to 5) so that they can move only vertically, that is by a ***parallel translation,*** with respect to each other, see also page 5, lines 32 to 34. A weight measuring unit 23 in the form of a strain gauge or load cell positioned between the trestles measures their r***elative displacement*** as a measure of hopper weight.

The dosage control scheme (see figure 10 and page 6, line 1, to page 8, line 26) involves ***processing*** the output 73 of the unit 23 to provide a weight signal to a bulk flow adjustment means 66. There, the actual ***measured weight change over a given time interval*** is determined ($\Sigma(\Delta M)_{CAL}$ at summing means 81) and compared with a ***target value*** ($\Sigma(\Delta M)_{DES}$, the desired weight of material to be spread per time interval from 82). Their ***difference*** is used to develop a ***correction signal*** 84 to bulk flow correction means 68 to control the dosing member 3.

3.2 The overall spreader structure and automatic feedback control are as in claim 1 in the form held allowable by

the opposition division. Nor is this disputed. What is disputed is:

(a) whether or not dosage in E1 is adjustable based "on the amount of material in the hopper amount determinable solely by the output signal provided by a displacement sensitive means" as formulated in claim 1 in the form held allowable;

(b) whether or not the hopper 2 in E1 can be seen to be supported on a first, rigid one of the two displaceable frames producing the weight measurement; and

(c) whether or not dosage in E1, which without a doubt is automatic, can be said to ***continuously*** adjusted during operation.

3.3 Turning to the first of these contentious issues, the Board notes that the relevant wording used in present claim 1 replaces that in claim 1 as originally filed, where dosage was adjusted "based ***solely*** on the measurement of displacement" (emphasis added). The exact meaning of either formulation - in particular what is meant precisely by "solely" in its context - and whether they mean the same is unclear to Board. Neither appear elsewhere in the description; "solely", in particular is used originally only in claim 1 as filed.

3.3.1 Leaving aside the questions of whether these expressions mean the same or whether there is a basis for any shift in meaning, the Board shall assume that both formulations refer to the solution set out in paragraphs [0003] to [0008] of the original published application, which are identical to the like numbered paragraphs of the patent specification. These state

that "[a]ccording to the invention ... the weight of material in said supply container can be ... assessed with the aid of one displacement sensitive means" which "provides after suitable processing a measure of the instantaneous amount (weight) of material", paragraph [0006]. "Processing is carried out in such a manner that it removes random fluctuations ... as the machinery moves over an uneven terrain", paragraph [0007]. The "processing could comprise the calculation of a running average over time [or] other smoothing methods", paragraph [0008]. It is recalled that the main object of the invention is how to provide a system comprising only one weighing cell and no reference cell, see paragraph [0004], as an additional reference cell for correcting for the effect of movement over uneven terrain was considered disadvantageous, paragraphs [0002] and [0003].

3.3.2 These passages offer the skilled reader a clear and unequivocal understanding of the basic elements of the main idea of the application as filed and maintained in the published patent: a correction for the effect (on weight measurement) of travel over uneven terrain is carried out by suitable ***processing*** of the output signal of a ***single weighing cell*** rather than using additional reference ***weighing cells***.

3.3.3 There is no express mention or implicit suggestion in description or drawings that other types of sensors or corrections might be excluded as argued by the Appellant. That they do not mention or show other types of sensors or corrections does not mean that these must not be present. As noted earlier the relevant feature in claim 1 (in any version, but in particular in its

original version) is unclear, and therefore cannot offer a ***direct and unambiguous*** basis for such a reading.

3.3.4 The Board concludes that the relevant wording in claim 1 is to be understood as pertaining to dosage adjustment being based on the output of only ***one*** (and no more) ***weighing cell***.

3.3.5 E1 also clearly features a single weighing cell, namely the weight measuring unit or strain gauge 23, located at the apex of the trestle, see figures 2 or 3. E1 in fact dispenses with further weighing cells for the same reason as does the patent, because it removes variations due to travel over uneven terrain in the very same way, namely by filtering them out in a bandpass filter 75, see page 6, lines 19 to 23, and figure 10. The relevant feature in claim 1 referred to (a) above is thus also known from E1.

3.4 As for point (b) the Board notes that the claim's wording that the container be "supported on a first rigid frame" can be read broadly. There is no indication in the description or figure that anything more precise is meant than that the container is mounted on or borne by a frame so that it supports the weight of the container and transmits it to the weighing cell. The wording itself does not imply any particular way in which the frame must support the container, directly or indirectly, say. Nor does it mean that the frame must be integrally formed or cannot be adjusted or changed, e.g. to assume different orientations.

Bearing this in mind, a first rigid frame as in claim 1 can be identified in E1 as the outer trestle 18, which is certainly rigid and which supports on it hopper 2 and its weight via the coupling members 9, 10,10A,12 and frame 1, see figures 1, 2 and 5 and page 4, lines 34 to 35.

Alternatively, frame 1 and the outer trestle 18, coupled by members 9,10,10A,12 and an hydraulic cylinder 18 can be seen to form a rigid frame assembly that supports the hopper 2. Due to the coupling members - ball couplings - the frame can be adjusted to rotate or tilt the spreader (page 4, lines 40 to 42) under the action of the hydraulic cylinder (page 4, lines 30 to 33) for edge spreading. The hydraulic cylinder not only moves the frame between its different positions, but must naturally also ensure sufficient rigidity once the frame is set in a position so that it can properly transmit weight to the weighing unit 23 during use.

Either way, the Board holds that in E1 also the hopper 2 is supported on a first rigid frame (the outer trestle 18 or the assembly). It is that frame which is resiliently connected to the inner trestle 19, and the relative (parallel and translatory) displacement of which is sensed by unit 23 as measure of hopper weight or amount. The feature pertaining to item (b) is thus also disclosed in E1.

3.5 Finally, with reference to item (c), the patent again provides no detail as to what is meant exactly by the dosage being adjusted "continuously". The actual feedback dosage control scheme is described only in the broadest detail, see in particular specification

paragraph [0013]. It hinges on estimating "instantaneous" mass from the weighing cell output signal and calculating the change of mass ***over a given time interval*** to ultimately to develop an error control signal. No further information is provided regarding the error signal or subsequent feedback control, much less that these should be continuous functions of time. In fact, given that the scheme as outlined in paragraph [0013] must calculate change o***ver a set time interval*** the error signal is necessarily produced at discrete time intervals. Clearly, therefore "continuously" is not to be understood in a strict mathematical sense. The Board rather reads it in its normal colloquial sense as meaning "uninterruptedly, without break, continually, constantly". This also appears more meaningful in context, where it consistently appears in combination with "automatically": dosage is thus ***automatically*** and ***constantly*** adjusted.

The automatic feedback dosage control of E1, as it is outlined above in section 3.1, third paragraph, is identical to that given in broad detail in paragraph [0013] of present patent's specification. It also provides an ***instantaneous*** measure of weight, page 6, line 29, which is then used to determine actual weight change per time interval, page 7, table and first paragraph. The feedback control scheme of E1 thus results in an equally automatic and constant dosage control or adjustment as in the patent.

The Board finds that E1 also discloses the feature relevant to item (c) above.

3.6 As E1 also discloses each of the sole contentious features (a) to (c), the Board concludes that the system of claim 1 as held allowable by the opposition division lacks novelty, Article 52(1) in combination with Article 54 EPC. The patent as amended thus fails to meet the requirements of the EPC. Pursuant to Article 101(2) and (3)(b) EPC the Board must therefore revoke the patent.

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