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Datasheet for the decision of 10 October 2014

Case Number: T 2495/10 - 3.2.04

Application Number: 02258692.9

Publication Number: 1321027

IPC: A01D75/30

Language of the proceedings: EN

Title of invention:
Gang mower assembly

Patent Proprietor:
Kverneland ASA

Opponent:
Octrooibureau Van der Lely N.V.

Headword:

Relevant legal provisions:
EPC Art. 100(a), 100(b), 100(c), 56

Keyword:
Grounds for opposition - insufficiency of disclosure (no)
Grounds for opposition - added subject-matter (no)
Inventive step - (yes)

Decisions cited:

Catchword:

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Case Number: T 2495/10 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 10 October 2014

Appellant: (Opponent)	Octrooibureau Van der Lely N.V. Weverskade 110 3147 PA MAASSLUIS (NL)
Representative:	Jennen, Peter Leonardus Hendricus Octrooibureau Van der Lely N.V. Cornelis van der Lelylaan 1 3147 PB Maassluis (NL)
Respondent: (Patent Proprietor)	Kverneland ASA 4344 Kvernaland (NO)
Representative:	Raynor, Simon Mark Urquhart-Dykes & Lord LLP Altius House 1 North Fourth Street Milton Keynes MK9 1NE (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 14 October 2010 rejecting the opposition filed against European patent No. 1321027 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	T. Bokor
Members:	A. de Vries
	P.Petti

Summary of Facts and Submissions

I. The Appellant (Opponent) lodged an appeal, received 14 December 2010, against the decision of the Opposition Division posted 14 October 2010 to reject the opposition against European patent No. 1 321 027 and simultaneously paid the appeal fee. The statement of the grounds of appeal was received 23 February 2011.

II. The opposition had been filed against the patent as a whole based on Article 100(a) EPC in combination with Articles 54 and 56 EPC for lack of novelty and inventive step, and on Article 100(b) EPC for insufficiency of disclosure and on Article 100(c) EPC for added subject-matter. It considered the following documents among others:
D4: GB-A-2 023 392
D10: DE-A1-196 20 070

The Opposition Division held that none of the raised grounds prejudiced the patent as granted.

III. Oral proceedings were duly held before the Board on 10 October 2014.

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 the independent claims as granted is as follows:

1. "A gang mower assembly (20) which comprises:

a steerable wheeled driving unit (21); and, front and rear mower units (25,26) spaced apart lengthwise of the driving unit (21), and laterally spaced apart so as to present a combined mowing face to a standing crop and with an overlap setting (31) which is zero or of minimal extent during straight line forward mowing, the front mower unit (25) being mounted on a forward part (22) of the driving unit (21), and the rear mower unit (26) being connected to a rear part (23) of the driving unit (21);
characterised by monitoring means which is operative, during a steering manoeuvre, to monitor instantaneously (i) distance travelled and (ii) the steering angle and to generate a compensating adjustment signal for the lateral adjustment of the rear mower unit (26); and control means which is responsive to the adjustment signal to effect instantaneous lateral adjustment of the rear mower unit (26) so that the rear mower unit substantially follows the path of the front mower unit (25) and effectively maintaining the overlap setting (31), during a steering manoeuvre, and substantially without risk of an unmown area being formed."

9. "A method of operating a gang mower assembly which comprises a steerable wheeled driving unit, front and rear mower units spaced apart lengthwise of the driving unit and laterally spaced apart so as to present a combined mowing face to a standing crop and with an overlap setting which is zero or of minimal extent during straight line forward mowing, monitoring means to monitor instantaneously distance travelled and the steering angle, and to generate a signal indicative of required lateral adjustment of the rear mower unit, and control means operative to effect instantaneous lateral adjustment of the rear mower unit, and comprising the following steps:

steering the front mower unit from a straight line position during a steering manoeuvre; monitoring instantaneously the distance travelled and the steering angle and generating an indication to the driver of required lateral adjustment of the rear mower unit; and, applying manual operation of the control means so as to adjust the rear mower unit laterally by a sufficient amount so that it follows the path of the front mower unit while maintaining the overlap setting, during the steering manoeuvre, and substantially without risk of an unmown area being formed."

10. "A gang mower assembly (20) which is adapted to be mounted on a steerable wheeled driving unit (21) and which comprises:
front and rear mower units (25,26) arranged to be spaced apart lengthwise of the driving unit (21), and laterally spaced apart so as to present a combined mowing face to a standing crop and with an overlap setting (31) which is zero or of minimal extent during straight line forward mowing, the front mower unit (25) being intended to be mounted on a forward part (22) of the driving unit (21), and the rear mower unit (26) is connectable to a rear part (23) of the driving unit (21);
characterised by monitoring means which is operative, during a steering manoeuvre, to monitor instantaneously (i) distance travelled and (ii) the steering angle and to generate a compensating adjustment signal for the lateral adjustment of the rear mower unit (26); and control means which is responsive to the adjustment signal to effect instantaneous lateral adjustment of the rear mower unit (26) so that the rear mower unit substantially follows the path of the front mower unit (25) and effectively maintaining the overlap setting

(31), during a steering manoeuvre, and substantially without risk of an unmown area being formed."

VI. The Appellant argued as follows:

The addition upon grant of a new dependent claim 13 directed specifically at automatic operation means that the skilled person now reads independent claim 1 as directed to an assembly with manual as well as automatic operation. Similarly, deletion of "automatic" from what is now specification paragraph [0008] broadens the disclosure to include also manually operated assemblies. Manual operation is disclosed but only in the context of a method.

The patent nowhere discloses how the adjustment signal is determined from the instantaneous distance and steering angle, nor is it clear which distance is meant. Many other degrees of freedom must also be involved, none of which are mentioned, so that efforts to obtain the desired result place an undue burden on the skilled person.

Whereas lack of novelty is no longer pursued, the claimed invention lacks inventive step starting from either D10 or D4. D4 indicates that the rear unit should ideally follow its track even if the tractor is turned. In the servo-control variant, this is only possible if distance as well as steering angle is measured. Determining the adjustment signal on the basis of these two inputs is a routine task. Similarly, D10 already suggests adjusting the angle of the mowing unit in dependence of the driving- and work parameters, one of which is specifically identified as the steering angle of the rear wheels. It would again be entirely routine for the skilled person to use a common driving

parameter such as distance to determine the adjustment signal.

VII. The Respondent argued as follows:

The indication that control means are responsive to the adjustment signal in claim 1 means nothing more than that it be capable of responding to the signal. This encompasses both manual and automatic operation and these options were always covered by claim 1.

The basic idea of the invention is to plot paths for the front and rear mowers and to make the rear unit follow the path of the front unit. The path is determined from instantaneous distance and steering angle, e.g. by vector mapping. This is clear to the skilled person from the patent itself. The relevant calculations can be done with routine mathematics using inter alia the vehicle geometry on paper. It requires no experimentation.

In D4 both units are front mounted to the driving unit. As the two units are spaced closely together the problem of different paths, due in fact to the large distance between a front and a rear mounted unit, does not occur. Nor is there any suggestion in D4 to use distance, which is not obvious per se. The approach of D4 further results in non-uniform overlap. In D10 the pivoting movement of the individual mower units is not a lateral movement. Working conditions do not necessarily imply sensing instantaneous distance, let alone using to plot and then adjust paths to ensure they are the same. If anything D10 teaches away from the claimed invention.

Reasons for the Decision

1. The appeal is admissible.

2. Background of the Invention

The patent is concerned with a gang mower assembly which has front and rear mower units mounted at front and rear end respectively of a steerable driving unit with each unit mowing separate adjacent swaths. In order that no areas are left unmown when the mower is steered into a curve or bend, see specification paragraph [0002], the distance travelled and the steering angle are monitored to generate an adjustment signal to effect instantaneous lateral adjustment of the rear mower unit so that it effectively follows the same path as the front unit, and so maintains them in overlap during steering. Claim 1 is to the whole gang mower, claim 10 to the assembly for mounting on a steerable driving unit, while method claim 9 is directed at the method of a manual variant.

3. Main Request : added subject-matter

3.1 The Appellant argues that introduction upon grant of a new dependent claim 13 explicitly directed at automatic operation of the control means has the effect that independent claims 1 and 10 are to be read as directed to manual as well as automatic assemblies, where the original application disclosed manual operation only in the context of a method.

3.2 In the Board's view claims 1 and 10 when given a reasonable reading, that is giving their terms their normal contextual meaning, can only reasonably be understood as referring to automatic operation. Thus, where claims 1 and 10 (which are unchanged with respect

to as filed claims 3 and 13 on which they are based) require "control means which is *responsive* to the adjustment signal to effect instantaneous lateral adjustment" (italics added) this will be understood in such a reading as meaning that the control means is adapted or configured to respond to the adjustment signal so as to effect the adjustment, or, stated otherwise, that the control means is adapted to effect the adjustment in response to the signal. The formulation "responsive ... to effect" does not imply a mere capability of the means to respond in this way as argued by the Respondent: rather the control means of claims 1 and 10 must be configured to respond to the signal. Adding a dependent claim 13 that explicitly states what is in fact implicit does not change the above reading and that claim is indeed superfluous.

3.3 Nor is this reading changed by deleting "automatic" in what has become specification paragraph [0008] (cf. paragraph [0006] in the published application). Further paragraph [0010], unchanged but for its number and which together with the preceding paragraphs describes the advantages of the invention as defined in claim 1 (unchanged paragraph [0007] repeats the wording of claim 1 verbatim) still states that the rear mower unit adjusts itself to compensate "automatically". The terms "automatic" and the related term "feedback" indeed reappear repeatedly in the description, see paragraphs [0014], [0026], [0027], [0030], [0034], [0037] (unchanged in content with respect to the application as filed), most notably however in paragraph [0026] in the section explaining the underlying problem and its solution. It is only in the penultimate paragraph (patent and application) that the reader is first informed of the possibility of manual operation, reflected in as filed claim 12 (claim 9 of the patent).

As will be immediately apparent to the skilled reader of both the originally filed application and the patent specification emphasis in the patent was and is on automatic control, with manual operation mentioned only as a possible variant.

3.4 From the above the Board concludes that the amendments made upon grant have not added to the content of the application as filed, Article 100(c) EPC.

4. Sufficiency of disclosure

4.1 The contention is that the patent nowhere explains how the adjustment signal is determined from the monitored distance and steering angle, or how lateral adjustment is subsequently achieved, and that given the many parameters that must be involved efforts to obtain the desired result put an undue burden on the skilled person.

4.2 The invention's basic concept as expressed in the independent claims uses instantaneously monitored distance and steering angle to adjust the lateral position of the rear unit so that it substantially follows the path of the front mower unit. Thus the path of the rear unit is adjusted so as to follow that of the front unit.

4.3 Firstly, the Board concurs with the parties that the skilled person using his normal understanding of terms read in context will understand "monitor instantaneously distance travelled and the steering angle" as meaning that the distance travelled and the steering angle are monitored instant by instant, that is essentially continuously and as a function of time. Here, the relevant skilled person is an agricultural

engineer specializing in the design, manufacture and operation of agricultural vehicles and who therefore possesses relevant knowledge of vehicle engineering.

4.4 For the skilled person defined above, moreover, it will be sufficiently clear from his knowledge and the stated aim of using monitored, time dependent distance and angle, that to make sure the rear unit "substantially follows the path of the front unit", that these monitored variables are to be used to determine the path of the front unit which the rear unit must follow. This can be done for example by routine techniques such as dead reckoning or vector tracking which are again well-known to the skilled person with knowledge of vehicular design and operation.

4.5 Finally, he will need to derive the rear unit's path in order to compare the two paths and make necessary adjustments. The rear unit's path follows from the front unit's path using the mower's geometry as will again be immediately clear to the skilled person from e.g. his knowledge of kinematics.

4.6 In this manner the broad strokes of the methodology will be apparent to the skilled person from the information given in the patent and using his knowledge in the field. It is immaterial in this regard that the patent does not provide a detailed example of the necessary calculations. The patent need not provide a blueprint of a mode of realization. Given also the many conceivable configurations and vehicle geometries it also appears unreasonable to the Board to expect that the patent describe down to minutest detail an example of how to calculate the adjustment for a given configuration. Rather, the skilled person should be able to derive from the information given in the patent

the basic, underlying principles of the claimed invention – its foundations - on which he can then build using routine knowledge and skills.

4.7 The Board concludes that the claimed invention is sufficiently clearly and completely disclosed for it to be carried out by the skilled person, Articles 100(b) and 83 EPC.

5. Inventive Step

5.1 Novelty is no longer disputed, but inventive step is still challenged starting from either D4 or D10 combined with the other document or common general knowledge.

5.2 Both D4 and D10 are concerned with avoiding uncut areas in curves; see D4 at page 1, lines 25 to 30; and D10 in the first paragraph of column 1. Both offer similar solutions, in particular both also disclose adjusting a unit's angle relative to a carrier vehicle in response to measured steering angle.

5.2.1 The mower of D4, see figures, has a front mounted unit carrying two front units 10 fixed to the tractor and a back mower unit 18 connected via hinged rods 20. In curves the units 10 respond immediately, but unit 18 swings sideways at a different rate depending on the curve radius so that the uncut middle stripe is not cut "until the rear unit 18 arrives at the place where the change of direction was initiated [by units 10]", p.2, lines 97 to 103. This is realized either mechanically using inclined castors 28 (figure 1) or with a servo-control system responding to a sensing ground following castor, page 3, lines 19 to 29.

5.2.2 In D10, see figures 2 to 4, the mower has a front mounted unit 7 and two centrally mounted units 5,6. Each can be pivoted or swung about an associated vertical axis during turns; the pivot angle can be controlled in dependence of travel- and operation parameters ("Stellwinkel ... in Abhängigkeit von Fahr- und Arbeitsparametern geregelt verstellbar", column 2, lines 22 to 28; see also column 7, lines 65 to 67). Column 2, lines 26 to 28, cites the steering angle of the mower's rear wheels as an example of a parameter for controlling adjustment ("Regelgrösse zur Verstellung des Schwenkwinkels", lit. control parameter for the adjustment of the pivot angle; though "Regelgrösse" normally denotes the output control parameter in a control loop, in the present context it can only reasonably be understood as referring to the input parameter that controls pivot angle). A possible implementation is shown in figure 6, see the bridging paragraph of columns 7 and 8, with actuating member 43 in the form of a hydraulic cylinder.

5.3 The assembly of claim 1 differs from these known assemblies inter alia in the mounting of the units front and back of the driving unit (in D4 all units are front mounted on the tractor, in D10 units 6,7 are mounted centrally). A further difference vis-a-vis D10, resides in the rear unit's lateral adjustment (in D10 the units 5 to 7 pivot about a vertical axis on the unit itself, column 6, lines 24 to 38, which does not result in any side to side movement of the unit as a whole).

More importantly, however, neither document discloses instantaneously monitoring the distance travelled as well as the steering angle in order to generate a compensating adjustment signal that then allows the

control means to perform a lateral adjustment so that the rear mower unit substantially follows the path of the front unit.

As stated any adjustment (whether lateral or pivotal) in D4 and D10 is based on steering angle, in D10 given as an example of otherwise unspecified "driving and operation" parameters. Though this adjustment also aims at avoiding uncut areas, it does not do so by making one unit follow the other. In D4 the only information as regards the nature of an adjustment concerns the first embodiment where the tilted castors are meant to delay movement of the rear unit, page 2, lines 97 to 107, figure 4. In D10 adjustment is such as to pivot the front unit in the direction of a turn, but the two rear units in the opposite direction, column 2, lines 14 to 22, figures 3,4.

5.4 As stated D4 and D10 both address the problem of uncut areas stated in paragraph [0005] which is defined there in relation to known solutions achieved purely by arranging the units with excessive overlap when the mower travels along a straight line. The adjustment of individual units in D4 and D10 must in similar manner also result in a reduction of straight travel overlap, so that this aspect of the problem stated in specification paragraph [0005] is also solved by this prior art. Starting from either document, the Board therefore reformulates the objective technical problem associated with the above differing features, in particular those concerning monitoring the distance and path following, as finding an alternative solution for avoiding uncut areas in turns without the need for large straight travel overlap between the units.

5.5 The central features of the claimed solution pertaining to monitoring distance to generate a signal for lateral adjustment of the rear unit so it follows the front unit (leaving aside any other differences of the units' arrangement and of the nature of the adjustment), are not apparent to the Board from any of the other prior art cited in the appeal; nor has this been argued by the Appellant. The Board also does not hold this solution to be a routine realization of the teaching of D4 or D10 as has been argued by the Appellant.

5.5.1 With regard to D4 the Board is unconvinced that this document suggests in any way that the rear unit should follow the path of the front unit. The statement on page 2, lines 103 to 107, that the rear unit should "follow its track ... until it reaches the place where the [uncut] grass stripe changes direction" does not necessarily imply that the front and rear units follow paths that are substantially the same. If anything figures 3 and 4 of D4 appear to show the opposite: in figure 3 the units can still be said to follow the same path (considered from their respective centres); figure 4, however, shows the rear unit has veered sideways off the centre of the curve followed by the front unit, producing a large inside and small outside overlap. Any teaching the skilled person might infer from D4 is that the delayed response should be sluggish for sharper curvatures, but fast for smaller curvature, page 2, lines 111 to 118. Applied to the servo-mechanism embodiment this would most likely result in a control in which the adjustment delay time simply increases with steering angle. Such a simple scheme requires no knowledge of the path or the distance travelled. Using distance as well as steering angle to make the rear unit follow the same path indeed represents a refinement over such a scheme which in the Board's view

goes beyond the normal skills and knowledge of the ordinary skilled person.

5.5.2 Similarly, there is no suggestion in D10 that the front and centrally mounted units should follow the same path. This does not follow from the overall aim of avoiding uncut areas as will be apparent from the discussion above for D4. Indeed, if figures 3 and 4 which show pivotal adjustment of one of the units, allow for any conclusion, it is that the pivoted unit is not following in exactly the same path of the other units. This would be all the more so if the front and central units are pivoted in opposing directions as indicated in column 2, lines 14 to 22. Nor is the Board convinced that it would be obvious from the general suggestion of controlling the pivot angle in response to "drive- and operation parameters" (column 2, lines 22 to 28; column 7, lines 62 to 27). D10 itself mentions the obvious and straightforward choice to implement, namely relating the pivot angle to the curve angle. Other parameters might spring to mind (for example vehicle speed or slope of the terrain), but there is no indication how such a parameter would then tie into the adjustment control. That the skilled person would consider using both distance and steering angle and that he would link this to the paths followed by the front and central units (leaving aside any other differences) in the Board's conviction goes well beyond routine skills of the skilled person.

5.6 The Board concludes that the skilled person starting from either D4 or D10 and using his routine skills and knowledge will fail to arrive in obvious manner at the invention defined in claim 1. As neither D4 nor D10 include the central features discussed above, their combination (whether obvious or not) will also not

result in the claimed invention. This conclusion holds also for independent granted claim 10 which defines the gang mower assembly separate of the steering unit on which it is adapted to be mounted but otherwise has the same content as claim 1. It holds equally for the manual variant of granted method claim 9, where the instantaneously monitored distance and steering angle are used to generate an indication to a driver of necessary lateral adjustment of the rear unit, with the control means than being operated manually to carry out the adjustment. The subject-matter of granted independent claims 1, 9 and 10 are thus seen to involve an inventive step in the light of the cited prior art, Article 100(a) with Articles 52(1) and 56 EPC.

6. In the light of the above the Board confirms the appealed decision's finding that none of grounds raised under Article 100 prejudice the maintenance of the granted patent.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Magouliotis T. Bokor

Decision electronically authenticated