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**Datasheet for the decision
of 23 September 2019**

Case Number: T 2570/16 - 3.2.01

Application Number: 11716596.9

Publication Number: 2566716

IPC: B60K17/28, B60K6/46

Language of the proceedings: EN

Title of invention:
TRACTOR WITH HYBRID POWER SYSTEM

Patent Proprietor:
Agco SA

Opponent:
Deere & Company/John Deere GmbH & Co. KG

Headword:

Relevant legal provisions:
EPC Art. 54(1), 100(a)

Keyword:
Novelty - (yes)

Decisions cited:

T 0153/85, T 0422/92

Catchword:



Beschwerdekammern

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Chambres de recours

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Case Number: T 2570/16 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 23 September 2019

Appellant: Deere & Company/John Deere GmbH & Co. KG
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 12 October 2016
rejecting the opposition filed against European
patent No. 2566716 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: W. Marx
 A. Jimenez

Summary of Facts and Submissions

- I. The appeal is directed against the decision rejecting the opposition against European patent No. 2 566 716.
- II. In its decision the opposition division held, *inter alia*, that the subject-matter of claim 1 as granted was new over the disclosure of D5 (EP 1 317 050 A2).
- III. Oral proceedings before the board took place on 23 September 2019.

The appellant (opponent) requested that the decision under appeal be set aside and the European patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed and the patent be maintained as granted, or in the alternative, that the patent be maintained in amended form on the basis of one of the auxiliary requests 1 to 5 as filed with letter dated 14 June 2017.

The respondent withdrew its objections regarding admissibility of the appeal and admissibility of document D5.1.

- IV. Claim 1 as granted reads as follows (broken into a feature analysis adopted by the parties):

M1.1 An agricultural tractor (100;200;300;400;500;600;700;800;900) comprising an internal combustion engine (107) for delivering torque, wheels (101-104) or tracks for imparting a propulsive force to the ground, and

M1.2 a power takeoff shaft (110) for delivering torque to implements attached thereto, a mechanical

drive connection between the engine and the power takeoff shaft,

M1.3 an electrical generator (115) drivingly connected to the engine, and

M1.4 at least one electrical motor (121-124) arranged to deliver a propulsion force to the wheels or tracks,

M1.5 the at least one electrical motor (121-124) being electrically connected to, and powered by, the electrical generator (115),

characterised in that

M1.6 the tractor (100) further comprises a battery (120) connected to the electrical generator and to the electrical motor, and

M1.7 a first motor/generator (115) which provides said electrical generator drivingly connected to the engine (107), and to which the battery (120) is connected so that electrical energy can be passed therebetween, wherein

M1.8 the first motor/generator (115) can operate as a motor so that the power takeoff shaft (110) is at least partially powered by electrical energy from the battery.

V. The appellant's submissions in as far as they are relevant to this decision may be summarised as follows:

Document D5.1 (EP 1 199 204 A1) was cited in the appeal proceedings as it was referred to in D5 (paragraphs [0003], [0025], [0035]), and the content of D5 and D5.1 had to be considered together as one document when judging on novelty (as found in T 153/85). D5.1 was directly included in D5 due to the reference in paragraph [0025] of D5 to the arrangement of the epicyclic gear train of D5.1; paragraph [0036] referred also to a "*conventional epicyclic gear train*".

Paragraph [0035] of D5 referred again to D5.1 as describing the operation of the hybrid power train according to the present invention. The skilled person was instructed to consider D5.1.

Features **M1.5** and **M1.8** required an electric connection between two electric machines and a gear recombining power supplied by the engine and the electric machines.

D5 disclosed a first and a second electric machine (paragraphs [0017], [0021]), both connected to a battery for storing energy. D5 also showed that part of the energy produced by an internal combustion engine was converted into electric energy (paragraph [0002]), i.e. it showed the use of a generator. Moreover (paragraph [0025]), electric power was produced by the electric machines, thus serving as electric drive. Both electric machines were connected to the battery so that, in case one electric machine was operated as generator and the other as motor, both were connected electrically and exchanged electric power via the battery. Moreover, D5.1 described (paragraphs [0021], [0023]) that either electric machine 13 or 20 (connected via power converter 15 to the battery) could be operated as generator or motor. In view of the reference in paragraph [0025] of D5, the teaching of D5.1 was incorporated in D5, so feature **M1.5** was shown.

The epicyclic gear train 40 of D5 (paragraph [0025]) divided and recombined the mechanical power supplied by the combustion engine and the electric power produced by the electric machines, which could also operate as generator. Power was supplied via the epicyclic gear train to a shaft 28 leading to the PTO or to the drive wheels (paragraphs [0034] and [0035]). Considering D5.1 (paragraphs [0073] and [0075]), the PTO was applied by

engaging the clutch 8 and could also be activated electrically taking electric energy from battery 33, without being driven by the combustion engine. Electric energy could also be used to drive the wheels. Thus, feature **M1.8** was disclosed.

VI. The respondent countered essentially as follows:

As found in the decision of the opposition division, there was no clear and unambiguous disclosure of the feature **M1.5** in document D5, since the connection between the electric machines and the battery pack was not shown in D5. No electrical interconnection between the two electric motors of D5 was shown, nor was there a disclosure in D5 of one electrical motor functioning as a generator and the other electrical motor functioning as a motor being powered by this generator. The two electrical motors of D5 might be electrically connected to two batteries, with no electrical connection therebetween.

The contents of D5.1 could not be used when considering feature **M1.5** (see T 153,85, T 422/92). According to paragraph [0025] of D5, D5.1 was only referred to in the context of the operation of an epicyclic gear train for the purposes of combining power from an engine and from electric machines, but not in the context of the connection of the electrical machines of D5 to a battery pack. Thus, the contents of D5.1 could only be referred to in the context of the use of an epicyclic gear train to divide and combine mechanical and electrical power, and as discussed by the appellant, in the context of feature **M1.8**. However, D5 showed a direct mechanical connection of the PTO to the power train, i.e. no teaching of electrical assistance as in D5.1, so there was no reason for routing electric energy to the PTO shaft as required by feature **M1.8**.

Reasons for the Decision

1. Novelty (Articles 54(1) and 100(a) EPC)

1.1 The subject-matter of claim 1 as granted is new over the disclosure of document D5 (Article 54(1) EPC).

1.2 The opposition division could not recognise a clear and unambiguous disclosure of features **M1.5** and **M1.8** in D5. The board follows the opposition division in that the layout or concept of the electric connection between the electrical machines and the battery pack is not further shown or described in D5, so that feature **M1.5** is not clearly and unambiguously disclosed in D5. In fact, the appellant has not provided any convincing argument in this respect, but only construed rather hypothetically ("*in case one electric machine was operated as generator and the other as motor ...*") a case which would fit to the wording of feature **M1.5**.

Therefore, on the basis of document D5 alone, novelty of the subject-matter has to be acknowledged already on the ground that feature **M1.5** is not known from D5.

1.3 In its main line of argument, the appellant referred to further prior art document D5.1 (EP 1 199 204 A1) cited and referred to in D5 (see paragraphs [0003], [0025], [0035]), arguing that the content of D5 and D5.1 had to be considered together as one document when judging on novelty (see T 153/85). D5.1 was directly included in D5 due to the reference in paragraph [0025] of D5 to the epicyclic gear train of D5.1 and the "*conventional epicyclic gear train*" mentioned in paragraph [0036]. A further reference in paragraph [0035] allegedly instructed the skilled person to consider D5.1.

1.4 In the case at hand, the question to be answered is therefore, in view of the explicit references to further prior art D5.1 in D5, whether the disclosure of D5.1 has to be considered, and if so, to which extent, as forming part of the disclosure of D5.

1.4.1 According to the jurisprudence of the Boards of Appeal, when assessing novelty, it is not permissible to combine separate items of prior art together, but it is only the actual content of a document which destroys novelty. As regards the issue of incorporation by reference of the disclosure of D5.1 in D5 put forward by the appellant, the board follows decision T 422/92 (not published; Reasons 2.3.1) cited by the respondent that this issue should be seen in the light of decision T 153/85 (OJ EPO 1988, 1 - point 4.2 of the Reasons).

It was found in T 153/85 that "... , where there is a specific reference in one prior document (the "primary document") to a second prior document, when construing the primary document (i.e. determining its meaning to the skilled man) the presence of such specific reference may necessitate that part or all of the disclosure of the second document be considered as part of the disclosure of the primary document".

1.4.2 The reference to D5.1 in paragraph [0003] of the patent specification ("A hybrid power train of this type...") relates to a hybrid power train as known in the prior art mentioned in preceding paragraph [0002] ("In the state of the art, hybrid power trains are known in which part of the energy produced by an internal combustion engine is converted into electric energy..."). The board finds that such a general reference does not enable the reader to conclude

therefrom which part of this known hybrid power train, e.g. what structural features or what modes of operation, should also apply for the invention described thereafter. It might only mean that the reader is referred to some background information on hybrid power trains. Thus, the section describing in D5 the known prior art cannot support at all that D5.1 or at least part of its disclosure should form part of the disclosure of the invention of document D5.

- 1.4.3 When describing an embodiment of the claimed invention in D5, paragraph [0025] refers to D5.1 in reciting: *"By means of known mechanisms described in EP-A-01203947.5, epicyclic gear train 40 divides and recombines the mechanical power supplied by diesel engine 11, and the electric power produced by electric machines"*. This passage explicitly refers to specific mechanisms known from D5.1, namely an epicyclic gear train, which is considered to be a reference to a known structural device which is used for dividing and recombining different contributions of power supplied by the engine (mechanical power) and the electric machines (electric power). The last sentence in paragraph [0036] reading *"...for transmitting power from the diesel engine, and to and from the two electric machines by means of a conventional epicyclic gear train"* can at best only support the teaching of paragraph [0025] on the epicyclic gear train known from D5.1 as a mechanical device for dividing and recombining power.

Based on the specific reference in these passages of D5, the board concludes that the teaching of D5.1 on an epicyclic gear train as a known mechanism or device for dividing and recombining the power of a diesel engine

and two electric machines forms part of the disclosure of D5.

- 1.4.4 However, this does not mean that the disclosure of D5.1 as a whole has to be considered to be incorporated in D5. In particular, the board cannot see that an electrical connection and a mode of operation of the hybrid power system as defined in feature **M1.5**, specifying that the electric generator (when drivingly connected to the engine, see feature **M1.4** or **M1.7**) powers the at least one electrical motor by virtue of an electrical connection between generator and motor, is disclosed in D5 when considering the isolated teaching on a known epicyclic gear train in D5.1. As stated in the patent specification (paragraphs [0035] and [0038]), this mode of operation requires a specific and coordinated control of a power control unit which distributes electrical energy to various components on the tractor, so that the electrical energy generated by the electrical generator powers the electric motor. Apart from stating that the first and second electric machines in D5 are connected to a battery pack (see paragraph [0021]), D5 is silent on such a coordinated control of the distribution of electrical power and even on the electrical connections required in this regard. In fact, the appellant has not provided any convincing argument in this respect, as argued already above under point 1.2.

Therefore, the board finds that any possible teaching as regards the distribution of electrical power in D5.1 (which also requires respective electrical connections) is not to be considered to form part of the disclosure of D5. The board does not follow the appellant's argument that in view of paragraph [0025] of D5 (which only refers to an epicyclic gear train) the teaching in

D5.1 in paragraphs [0021] to [0023], disclosing two electric machines connected via a power converter to a battery and acting either as a generator or a motor, has to be considered as being incorporated in D5. D5.1 cannot be used as a reservoir to supplement certain features missing in D5, as long as there is no explicit reference in D5 to D5.1 as providing more detailed information on these features.

1.4.5 With similar reasoning, the board cannot see how the rather general statement in paragraph [0035] in D5, according to which *"Operation of the hybrid power train according to the present invention is described fully in EPA-A-01203947.5 to which the reader is referred for further details"*, can lead to a different conclusion. The appellant's sole argument in this respect, that the skilled person was instructed to consider D5.1, is an argument to be considered when assessing inventive step and is irrelevant in the assessment of novelty.

1.5 As follows from the above, on the basis of those parts of D5.1 which according to the board's judgement are incorporated in D5, no further teaching with regard to feature **M1.5** is provided.

Therefore, the subject-matter of granted claim 1 is also new over D5 and those parts of D5.1 to be incorporated in D5, as feature **M1.5** is not clearly and unambiguously disclosed in D5 and the parts of D5.1 relating to the epicyclic train gear. In view of this finding, it can be left open whether feature **M1.8** might be disclosed in D5 and in further parts of D5.1 to be incorporated, as argued by the appellant.

2. No further line of argument has been put forward by the appellant that might challenge the validity of the patent as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated