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**Datasheet for the decision  
of 16 November 2010**

**Case Number:** T 1902/08 - 3.2.08

**Application Number:** 02008990.0

**Publication Number:** 1262677

**IPC:** F16C 43/04

**Language of the proceedings:** EN

**Title of invention:**

Combination of a shaft and a bearing

**Applicant:**

DEERE & COMPANY

**Opponent:**

-

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 54, 56

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

-

**Keyword:**

"Novelty and inventive step (yes, after amendment)"

**Decisions cited:**

-

**Catchword:**

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Case Number: T 1902/08 - 3.2.08

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.08  
of 16 November 2010

**Appellant:**

DEERE & COMPANY  
One John Deere Place  
Moline  
Illinois 61265-8098 (US)

**Representative:**

Magin, Ludwig Bernhard  
Deere & Company  
European Office  
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**Decision under appeal:**

Decision of the Examining Division of the  
European Patent Office posted 5 June 2008  
refusing European application No. 02008990.0  
pursuant to Article 97(2) EPC.

**Composition of the Board:**

**Chairman:** T. Kriner  
**Members:** M. Alvazzi Delfrate  
A. Pignatelli

## Summary of Facts and Submissions

I. By decision posted on 5 June 2008 the examining division refused European patent application No. 02 008 990.0, on the grounds that the subject-matter of claim 1 as originally filed was not new with respect to

D1: US-A-5 660 484.

II. The appellant (applicant) filed an appeal against this decision on 19 July 2008. On the same day it paid the appeal fee and submitted a statement of grounds of appeal.

III. Oral proceedings before the board of appeal were held on 16 November 2010.

IV. The appellant requested that the decision under appeal be set aside and that a patent be granted in the following version:

claim 1 as filed during the oral proceedings before the board, claims 2 to 11 filed by letter of 4 October 2010;

description pages 1 to 5 and 7 to 10 filed on 23 April 2002, page 6 filed by letter of 4 October 2010;

Figures 1 to 8 filed on 23 April 2002.

V. Claim 1 reads as follows:

"Combination of a shaft (22) having a bearing mounting portion of non-circular cross section and of a bearing (26) having inner race (28) and outer races (30) disposed on opposite sides of rotating elements with said inner race (28) being provided with an opening mating with, and received on, said non-circular cross section of said shaft (22), characterised by a clamping assembly acting between said shaft (22) and opposite sides of said inner race (28) of said bearing (26) for preventing said inner race (28) from moving either axially or radially relative to said shaft (22) and including a threaded element (54) coupled to, and moveable relative to, an end of said shaft (22); said threaded element (54) having an axially inwardly facing surface; a stop structure fixed to said shaft (22) at a location on an opposite side of said inner race (28) of said bearing (26) from said inwardly facing surface; and said clamping assembly including at least one axial load transfer element (62) engaged by said inwardly facing surface and acting so as to create a force transferred to said stop structure by way of said inner race (28) of said bearing (26)."

VI. In addition to D1, the following document is relevant for the present decision:

D5: US-A-5 448 944.

## Reasons for the Decision

1. The appeal is admissible.
  
2. The most relevant state of the art is represented by D5, relating to the same object as the patent in suit, i.e. prevention of knocking noise in a bearing subject to high axial loads, for instance in a hay baler (see column 1, lines 9-13 and lines 24-52).
  - 2.1 D5 discloses a combination of a shaft (11) having a bearing mounting portion of non-circular cross section (26) and of a bearing (10) having inner race (12) and outer races (14) disposed on opposite sides of rotating elements (16) with said inner race being provided with an opening (24) mating with, and received on, said non-circular cross section of said shaft. Knocking noise is reduced thanks to the provision of splines on the inner race and the shaft (see column 2, lines 6-14 and lines 22-26).
  
  - 2.2 Starting from the combination disclosed in D5, the object underlying the claimed invention is to prevent knocking in a way which does not require spline hobbing (see paragraph [0002] of the published application).
  
  - 2.3 This object is achieved by providing a clamping assembly acting between said shaft and opposite sides of said inner race of said bearing for preventing said inner race from moving either axially or radially relative to said shaft and including a threaded element coupled to, and moveable relative to, an end of said shaft; said threaded element having an axially inwardly racing surface; a stop structure fixed to said shaft at

a location on an opposite side of said inner race of said bearing from said inwardly facing surface; and said clamping assembly including at least one axial load transfer element engaged by said inwardly facing surface and acting so as to create a force transferred to said stop structure by way of said inner race of said bearing.

This clamping assembly prevents the inner race from undergoing radial movement, thereby eliminating rotational knock (see paragraph [0008] of the published application).

The prior art does not render it obvious to achieve the object above according to claim 1.

2.4 D1 is less relevant. Although it discloses all features of claim 1 as originally filed, this document does not relate to the same object as the claimed invention. Rather it concerns the manner of installing a bearing on a shaft (see column 1, lines 5-8) in an assembly which may be used in a vehicle steering column (see column 2, lines 40-42). To achieve this object D1 suggests a bearing (12) mounted on a shaft (1) having a bearing mounting portion of non-circular cross section (see Figure 4) and a clamping assembly acting between said shaft and opposite sides of the inner race of said bearing for preventing said inner race from moving (see Figure 3). However, the clamping assembly disclosed in D1 is not realised as in the presently claimed invention, but by means of a resilient compressible assembly, which is mounted on the shaft and abuts one end of the bearing assembly, and a sleeve slidable along the shaft to abut the other end of the

bearing assembly and including a catch portion in engagement with a detent on the shaft (see claim 1). Since this arrangement is essential for the manner of installing the bearing on the shaft disclosed in D1, it was not obvious to modify it, in particular according to present claim 1.

2.5 In view of the foregoing, the subject-matter of claim 1 involves an inventive step.

**Order**

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

1. The decision under appeal is set aside.
  
2. The case is remitted to the first instance with the order to grant a patent on the basis of the following documents:

**Claims:**

claim 1 filed during the oral proceedings before the board,  
claims 2 to 11 filed by letter of 4 October 2010;

**Description:**

pages 1 to 5 and 7 to 10 filed on 23 April 2002,  
page 6 filed by letter of 4 October 2010;

**Drawings:**

Figures 1 to 8 filed on 23 April 2002.

The Registrar:

The Chairman:

V. Commare

T. Kriner