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Datasheet for the decision of 25 April 2008

Case Number: T 0649/06 - 3.2.04

Application Number: 02024107.1

Publication Number: 1308628

IPC: F04D 13/06

Language of the proceedings: EN

Title of invention:
Coupling device

Patentee:
Askoll Holding S.r.l.

Opponent:
Hanning Elektro-Werke GmbH & Co. KG

Headword:
-

Relevant legal provisions:
-

Relevant legal provisions (EPC 1973):
EPC Art. 100(a) and (b)

Keyword:
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
T 0305/87

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0649/06 **-** 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 25 April 2008

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 1 March 2006 rejecting the opposition filed against European patent No. 1308628 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: M. Ceyte
Members: C. Scheibling
T. Bokor

Summary of Facts and Submissions

I. By its decision dated 1 March 2006 the Opposition Division rejected the opposition. On 2 May 2006 the Appellant (opponent) filed an appeal and paid the appeal fee simultaneously. The statement setting out the grounds of appeal was received on 27 May 2006.

II. The patent was opposed on the grounds based on Articles 100(a) and (b) EPC 1973 (lack of novelty and inventive step; insufficiency of disclosure).

III. The following documents played a role in the present proceedings:

D1: WO-A-99/48189
D6: DE-A-44 24 257
D7: DE-U-93 02 945
D10: DE-C-487 785
D11: US-A-6 131 477
D12: US-A-4 328 879

IV. Claim 1 as granted read as follows:

"1. An improved device for transmitting motion between the rotor (10) of a synchronous permanent-magnet motor and a working part (17) associated to said rotor (10), comprising:
- a first coupling (2), provided with a driving element (23), which is eccentric with respect to the rotation axis of the rotor (10), at a rotor shaft (16) end,
- a second coupling (3), which cooperates in a kinematic series with said first coupling (2) and is provided with a driven element (24), that is eccentric

with respect to the rotation axis of the rotor (10) and rigid with said working part (17), said driving (23) and driven (24) elements lying in distinct and non-interfering axial positions,

- characterised by comprising two elastic elements (25, 26), which are set angularly after each other, one of them interfering with the driving element (23) of the first coupling (2) and the other one interfering with the driven element (24) of the second coupling (3)."

V. Oral proceedings took place on 25 April 2008 before the Board of Appeal.

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

He mainly argued as follows:
According to the invention the claimed device comprises two elastic elements. These elastic elements are separate according to Figure 1 but are made of one-piece according to claim 4 and figure 2. Since the claims and the Figures are inconsistent in this respect, a skilled person would be unable to carry out the claimed invention.
Furthermore the subject-matter of claim 1 is not novel with respect to the embodiment according to Figures 14 to 16 of D1 seen alone or in combination with the embodiment according to Figures 12 and 13 of D1.
Even if novel, the subject-matter of claim 1 would not involve an inventive step with respect to a combination of the embodiments according to Figures 14 to 16 with that according to Figures 12 and 13 of D1. A combination of the embodiment according to Figures 14 to 16 of D1

with D6, D7 or any one of D10 to D12 would also render the subject-matter of claim 1 obvious.

The Respondent (patentee) contested the arguments of the Appellant and submitted inter alia that D1 does not disclose two elastic elements in the embodiments of Figures 12 and 13 or Figures 14 to 16. Furthermore a combination of these two embodiments would not lead to the claimed device. Neither D6 nor D7 teaches to use two elastic elements so that when transmitting torque through these elements the propagation of the shock wave is interrupted by the separation between the two elastic elements. Therefore combining D1 with D6 or D7 cannot lead to the claimed device either.
D10 to D12 are late filed, relate to remote technical fields and would not be taken into consideration by a skilled person because they do not to solve the problem of the invention and are not suitable for use with a synchronous motor.

The Respondent requested that the appeal be dismissed, i.e. that the patent be maintained as granted.

Reasons for the Decision

1. The appeal is admissible.

2. *Sufficiency of disclosure:*

2.1 Claim 1 refers to "two elastic elements (25, 26), which are set angularly after each other" and thus, to two distinct elements. Claim 4 adds that these elements "are

made a one-piece construction by means of a connecting diaphragm or bridge (27)".

2.2 According to the description of the contested patent (paragraphs [0037] and [0047] and Figure 1) element 5 comprises at least a pair of elastic elements 25 and 26 and each elastic element, 25 or 26 of element 5 is a ring segment. Additionally the description indicates (paragraphs [0049] and [0053]) that "Advantageously, elements 25 and 26 can be made a one-piece construction by means of a diaphragm or bridge 27 located in a middle position. This brings about the advantage that element 5, comprising elements 25, 26, can be individually handled for instance by machines or apparatus of "pick and place" type, suitable for an automatic assembling" and "As a matter of fact, the optional presence of the diaphragm or bridge 27 has no effects; the diaphragm is even very likely to break in the long run, but this does not impair in any way the proper working of the motion transmission device 1."

2.3 This means that there are two distinct elements, which can be made in a single manufacturing operation (such as moulding) in which case they are linked by a bridge having no technical effect and being likely to break during use. Thus, it is clear for a skilled person that the elements 25 and 26 are two entities which operate as such, even when bridged. Accordingly, contrary to the Appellant's submission, there is no inconsistency in the disclosure that could prevent a skilled person from carrying out the claimed invention.

2.4 Consequently the ground for opposition according to Article 100(b) EPC 1973 does not prejudice the maintenance of the patent in suit.

3. *Novelty:*

3.1 Novelty of the subject-matter of claim 1 has been challenged with respect to the embodiment according to Figures 14 to 16 of D1. The description of D1 (page 14, lines 5 to 9) states "Said second tooth 439 has an internal supporting part 439a made of rigid plastics which is monolithic with the annular element 440, which in this case has a substantially cylindrical structure, and is embedded in the remaining part 439b made of elastomeric material, which is overmolded on the preceding one and forms the contact surfaces".

3.2 The Appellant derives from this passage and the Figures that the second tooth is formed by two elastic elements 439b which are located on both sides of the supporting part 439a and bridged to form two elastic elements in the meaning of the contested patent, all the more because the term "bridged" has not been defined in the patent specification.

3.3 This cannot be accepted. The elastic element of D1, Figures 14 to 16, is made of one piece, as clearly indicated in the description ("a second tooth 439"). The use of the words "embedded" and "overmolded" leaves not doubt that this "tooth" behaves like a single monolithic part. Accordingly, this embodiment does not comprise "two elastic elements" as required by claim 1 of the contested patent.

3.4 The Appellant also argued that the combination of the embodiment according to Figures 14 to 16 with the embodiment according to Figures 12 and 13 would be novelty destroying. He referred in this respect to the decision T 305/87 (OJ EPO 1991, 429) which states "It is not permissible to combine separate items belonging to different embodiments described in one and the same document merely because they are disclosed in that one document, unless of course such combination has been specifically suggested therein".

3.5 However, the mere fact that similar elements bear corresponding reference numbers, e.g. 339 in Figure 13 and 439 in Figure 16, which is commonly used in patent drafting cannot be regarded as a clear suggestion of combining the embodiments of Figures 13 and 16. Furthermore, with respect to the embodiment of Figures 12 and 13, it is stated, page 12, lines 5 to 9 of the description "The second tooth is composed…" and "In this case it is also possible to provide the second tooth 339 monolithically". This clearly indicates that the tooth of this embodiment too is one single entity.

3.6 Novelty of the subject-matter of claim 1 with respect of D1 is therefore given.

4. *Inventive step:*

4.1 D1 (Figures 14 to 16) discloses a device for transmitting motion between the rotor of a synchronous permanent-magnet motor and a working part (432) associated to said rotor (page 1, first paragraph), comprising a first coupling (438), provided with a driving element (437), which is eccentric with respect

to the rotation axis of the rotor, at a rotor shaft (419) end, a second coupling (434, 435), which cooperates in a kinematic series with said first coupling (438) and is provided with a driven element (441), that is eccentric with respect to the rotation axis of the rotor and rigid with said working part (432), said driving (437) and driven (441) elements lying in distinct and non-interfering axial positions, and an elastic element (439) interfering with the driving element (437) of the first coupling (438) and the driven element (441) of the second coupling (434, 435).

4.2 The device according to claim 1 differs from that of D1 in that it comprises two elastic elements, which are set angularly after each other, one of them interfering with the driving element of the first coupling and the other one interfering with the driven element of the second coupling.

4.3 A drawback faced by this kind of driving couplings is that the very high acceleration rates of the rotor cause a shock between the driving and driven members which propagates through the intermediate elastic element (paragraph [0019] of the patent specification).

The problem to be solved by the claimed invention can be seen in enhancing the fatigue resistance of the components (paragraph [0025] of the patent specification).

4.4 This problem is solved by the invention in that the propagation of the shock wave between the driving and driven elements through the intermediate elastic element (paragraphs [0019] to [0021] of the patent in suit) is

reduced by providing two elastic elements set angularly after each other so as to spread the shock energy over a large volume and deaden the reflected shock wave by the gap provided therebetween (paragraph [0052] of the contested patent).

4.5 The Appellant argued that the advantages stated in the patent specification are not achieved by the claimed solution, so that the problem addressed by the invention would be to provide an alternative to the one piece elastic element coupling. However, providing two elements instead of one would be an obvious alternative arrangement for a skilled person.

The Board cannot agree to this point of view. During the first instance proceedings, the Respondent (patent proprietor) has provided test results to illustrate the advantages of the invention. By contrast, the Appellant has submitted no evidence in support of his allegations. However, the burden of proof lies with the Appellant which alleges the fact that the claimed invention does not provide the alleged advantages.

Furthermore, according to the established case law of the Boards of Appeal the question to be answered is not whether a skilled person could have arrived at the invention by modifying the prior art, but rather whether, in expectation of the advantages actually achieved (in the light of the technical problem addressed), he would have done so because of promptings in the prior art. What a skilled person would have done depends in large measure on the technical result he had set out to achieve. A skilled person does not act out of idle curiosity but with a specific technical purpose in mind.

Accordingly, in the present case, there was not hint and no reason for a skilled person to replace the single elastic element of the construction of D1 by two distinct elastic elements.

4.6 The Appellant argued that D6 as well as D7 disclose two separate elastic elements and that it would therefore be obvious for a skilled person to replace the elastic element of D1 by two elastic elements as taught by D6 and D7.

This line of reasoning cannot be accepted either.

D6 (column 3, lines 51 to 57; Figure) discloses a coupling device comprising two stages, each of which allowing an amount of free rotation of the rotor through a given angle. One of the stages comprises two flanges; the first flange exhibits two axial teeth which are received in corresponding cavities of the second flange. Two elastic elements are located in each cavity. However, it is not specified whether or not both elements are located on the same side with respect to each the teeth, i.e. between the contact surfaces of the tooth and the cavity.
Thus, D6 does neither teach nor suggest providing two elastic elements set angularly after each other, one of them interfering with the driving element of the first coupling and the other one interfering with the driven element of the second coupling.

D7 (figures 2, 3) clearly shows that the two elastic elements are mounted one on each side of the cooperating teeth (18 and 20). Consequently the elements are not set angularly after each other and each element interferes

with both the driving element of the first coupling and the driven element of the second coupling.

Accordingly, neither is there any such disclosure or suggestion in D1, D6 or D7 of providing two elements set angularly after each other. A combination of D1 with D6 or of D1 with D7 can thus not result in a device according to claim 1.

4.7 The Appellant argued that D10, D11 and D12 all teach to provide two or more elastic elements in series in order to reduce or to absorb shock loads.

However, these documents do not relate to driving couplings suitable for transmitting motion between the rotor of a synchronous permanent-magnet motor and a working part. They are not even comparable in terms of size and load to be transmitted. Furthermore, in these driving couplings the driving and driven elements are not lying in distinct and non-interfering axial positions, so that the elastic elements work in quite different conditions.
Finally, the problem the invention seeks to solve, i.e. to reduce the propagation of the shock wave due to an impact of the driving element after an idle rotation, does not occur.
For all these reasons a skilled person seeking to solve the above mentioned problem would have not taken these documents into consideration.

Moreover, there is no disclosure in D10 of providing two elastic elements set angularly after each other for reducing shock loads, but for pre-tensioning the elements of the coupling by placing a spring between the

elastic elements to avoid any play that could occur due to wear of the coupling elements.

The Appellant also argued that a skilled person would learn from either D11 or D12 that providing more than one elastic elements reduces the shock loads forces. However, although these citations relate to a reduction of the shock load forces, there is no indication that this reduction is obtained by a plurality of elastic elements. D11 solely states that "The use of multiple resilient plugs … produces a relatively long cushion stroke…" (column 3, lines 32 to 36). D12 mentions that the torque is transmitted through tandem rubber cylinders in the forward direction and through a reversing cylinder in the opposite direction (column 4, lines 40 to 50) without explaining why two elements are used in the forward direction. Thus, none of these documents teaches to provide two elements set angularly after each other to reduce the shock load forces.

4.8 Consequently, none of the documents cited in these proceedings suggests either alone or in combination the solution claimed in claim 1 as granted, which therefore involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The registrar: The Chairman:

D. Sauter M. Ceyte