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**Datasheet for the decision  
of 26 October 2011**

**Case Number:** T 0069/09 - 3.2.05

**Application Number:** 02791432.4

**Publication Number:** 1412665

**IPC:** F16L 1/12

**Language of the proceedings:** EN

**Title of invention:**

A bending-restricting anchoring arrangement and an anchored flexible pipe structure

**Patentee:**

NKT Flexible I/S

**Opponent:**

Technip France

**Headword:**

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**Relevant legal provisions:**

EPC Art. 54(2), 56, 100

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

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**Keyword:**

"Admissibility of fresh grounds for opposition - main request (no)"

"Novelty and inventive step - main request (yes)"

**Decisions cited:**

G 0010/91, T 0309/92

**Catchword:**

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Case Number: T 0069/09 - 3.2.05

**DECISION**  
of the Technical Board of Appeal 3.2.05  
of 26 October 2011

**Appellant I:**  
(Opponent)  
Technip France  
6-8, Allée de l'Arche  
Faubourg de l'Arche  
ZAC Danton  
F-92400 Courbevoie (FR)

**Representative:**  
Bertrand, Didier  
S.A. Fedit-Loriot  
38, Avenue Hoche  
F-75008 Paris (FR)

**Appellant II:**  
(Patentee)  
NKT Flexibles I/S  
Priorparken 510  
DK-2605 Brøndby (DK)

**Representative:**  
Hegner, Anette  
Hegner & Partners A/S  
Banemarksvej 50  
DK-2605 Brøndby (DK)

**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
14 November 2008 concerning maintenance of  
European patent No. 1412665 in amended form.

**Composition of the Board:**

**Chairman:** W. Zellhuber  
**Members:** P. Lanz  
M. J. Vogel

## Summary of Facts and Submissions

I. Appellant I (opponent) and appellant II (patent proprietor) each lodged an appeal against the decision of the opposition division maintaining European patent No. 1 412 665 in amended form.

II. The opposition against the patent as a whole was based on Article 100(a) EPC (lack of novelty, Article 54(2) EPC, and lack of inventive step, Article 56 EPC).

With respect to the patent proprietor's main request, the opposition division held that the subject-matter of claim 15 as granted did not meet the requirements of Article 54(2) EPC.

Regarding the first auxiliary request the opposition division decided that the amended set of claims met the requirements of the EPC, in particular of Articles 54(2), 56, 123(2) and 123(3) EPC.

III. Oral proceedings were held before the Board of Appeal on 26 October 2011.

IV. Appellant I requested that the decision under appeal be set aside and that the European patent No. 1 412 665 be revoked.

Appellant II requested that the decision under appeal be set aside and that the patent be maintained on the basis of the following documents:

- main request: claims 1 to 18 as granted; or
- first auxiliary request: claims 1 to 18 as maintained by the opposition division; or

- second auxiliary request: claims 1 to 14, submitted as second auxiliary request on 23 September 2011.

V. Independent claims 1 and 15 of the patent as granted (main request) read as follows:

"1. A bending-restricting anchoring arrangement for anchoring of a flexible pipe (1a, 1b, 1c), said anchoring arrangement comprises a first (2) and a second (3) holding sleeve, each holding sleeve, spaced from each other, capable of being secured to the pipe, said first (2) holding sleeve being pivotally secured via a rigid main connecting member (5) to a main anchoring unit (6) fixed directly or in a stiff connection to the seabed to which the pipe is to be anchored, said second (3) holding sleeve being secured to the first (2) holding sleeve via a mechanical coupling (11), which mechanical coupling (11) ensures that any movement provided by the first holding sleeve (2) will be at least partly transferred to the second holding sleeve (3), the movement of the second (3) holding sleeve thereby being coordinated with the movement of the first holding sleeve and thereby the movement of the rigid connecting member."

"15. An anchored flexible pipe structure for the transport of a fluid between a seabed to a sea surface, said structure comprises a flexible pipe (1a, 1b, 1c) and an anchoring arrangement for anchoring the flexible pipe (1a, 1b, 1c) to the seabed (8), said anchoring arrangement comprise a first (2) and second (3) holding sleeves (*sic*), each holding sleeve, spaced from each other, is secured to the pipe, said first (2) holding sleeve being pivotally secured via a rigid main connecting member (5) to a main anchoring unit (6) to

which the pipe is thereby anchored, said second (3) holding sleeve being secured to the first (2) holding sleeve via a mechanical coupling (11), which mechanical coupling (11) can transfer movements from the first holding sleeve (2) to the second holding sleeve (3), the movement of the second (3) holding sleeve and the rigid connecting member (5) thereby being coordinated with each other."

VI. The documents referred to in the appeal proceedings included the following:

A1: EP-A-0 894 938

A2: FR-A-2 627 542

A3: JP-A-01 30 813

A4: WO-A-98/35 363

A5: FR-A-2 286 757

A6: Translation of the term "*articulé*" according to the "Dictionnaire de l'Académie française", 9<sup>th</sup> edition (online)

VII. The arguments of appellant I regarding the main request, in writing and during the oral proceedings, can be summarised as follows:

*Insufficiency of disclosure and added subject-matter*

The subject-matter of granted claim 1, in particular the feature that the "*mechanical coupling ensures that*

*any movement provided by the first holding sleeve will be at least partly transferred to the second holding sleeve"*, was not disclosed in a manner sufficiently clear and complete to be carried out by a person skilled in the art. It also extended beyond the content of the application as filed.

The ground of added subject-matter according to Article 123(2) EPC could be examined by the Board following decision T 309/92 since it had been raised and dealt with by the Opposition Division in paragraphs 2.1 and 3.2 of their Reasons for the Decision.

#### *Novelty*

The subject-matter of the independent claims was not novel in view of the teaching of document A1. In particular, the term "*tirant d'ancrage*" should be understood as an anchoring tie rod. In document A1 this element would, when in use, be under tension and therefore stiff, thereby also implying a pivotal anchoring in the deadman (12). Moreover, the claimed mechanical coupling was present in document A1 in the form of a set of articulated vertebrae, the purpose of which was to limit the bending of the pipe. This would inevitably lead to an at least partly co-ordinated movement of the holding sleeve (15) and the vertebrae. Since the last, as well as any other, vertebra could be seen as a second holding sleeve in the sense of the patent in suit, a coordinated movement of the first and second holding sleeves was disclosed in document A1.

*Inventive step*

Document A1 formed the closest prior art. On the basis that the main connecting member were rigid and the mechanical coupling transferred movements from the first holding sleeve to the second holding sleeve, thereby coordinating the movement of the second holding sleeve and the rigid connecting member, and that these features distinguished the subject-matter of the independent claims from the disclosure of document A1, the problem to be solved by the claimed invention was to avoid the risk of over-bending of the pipe.

A person skilled in the art would obviously solve this problem by applying his general knowledge and providing a rigid main connecting element. Additionally, he would limit the movement of the vertebrae relative to each other and thereby achieve the coordinated movement as claimed.

In the written procedure, appellant I additionally put forward arguments based on the first embodiment shown in Figs. 2 to 5 of document A2. The claimed invention differed from the teaching of document A2 in the same features as discussed above in the context of document A1. The claimed solution of limiting the flexibility within the set of vertebrae was not only obvious when taking into account the skilled person's common general knowledge, but was also known from the second embodiment of document A2 depicted in Fig. 7, from Figs. 2 and 4 of document A3 or from the teaching of document A4.

VIII. The arguments of appellant II regarding the main request, presented in writing and during the oral proceedings, can be summarised as follows:

*Insufficiency of disclosure and added subject-matter*

The grounds for opposition according to Art. 100(b) and (c) EPC constituted fresh grounds for opposition. It was requested, with reference to G 10/91, that they should not be allowed into the proceedings. Moreover, decision T 309/92 was not applicable since in the present appeal case the Opposition Division did not introduce of its own motion either of the grounds for opposition under Art. 100(b) or (c) EPC.

*Novelty*

The subject-matter of the independent claims was novel over the prior art. Document A1 did not disclose a main connecting member that was rigid and a first holding sleeve that was pivotally secured via the rigid main connecting member to the main anchoring unit. In this context, reference was made to document US-A-6 109 833, a US equivalent of document A1, where "*tirant d'ancrage*" was translated as tethering line.

A further feature distinguishing the claimed invention from document A1 was the mechanical coupling between the first and second holding sleeves for coordinating the movement of the second holding sleeve with the movement of the rigid connecting member; the set of vertebrae in document A1 merely corresponded to a set of pearls on a string without mechanical coupling between them.



*Inventive step*

The disclosure of document A1 could not put the inventive merit of the patent in suit into question since it was directed to a different solution intended for other circumstances, in particular for the use in shallow water. The skilled person had no motivation to provide a pivotally secured holding sleeve or a stiff tension anchor, which could even damage the pipe. Moreover, for the purpose of selecting the length of the tension anchor in document A1 the minimum bending radius (MBR) of the pipe was taken into account, resulting in the de-coupling of the movement of the holding sleeve (15) from the movement of the frustoconical vertebra, thereby avoiding any excessive flexion of the pipe.

**Reasons for the Decision**

1. *Main request*

1.1 Insufficiency of disclosure and added subject-matter

The appeal by appellant I is based *inter alia* on the grounds for opposition according to Art. 100(b) and 100(c) EPC, which the appellant raised for the first time at the appeal stage against claim 1 of the main request, a claim which had been left unamended during the opposition proceedings.

Nor did the opposition division raise these grounds of its own motion at any stage of the opposition

proceedings. In fact, the passages of the decision under appeal cited in this context by appellant I do not deal with the provisions of Art. 100(c) EPC: paragraph 2.1 of the Reasons refers to the novelty and clarity of claim 1 of the main request, while paragraph 3.2 is directed to the provisions of Art. 123(2) EPC with respect to the amendments to claim 15 of the first auxiliary request carried out during the opposition proceedings.

Finally, it is noted that decision T 309/92, which was referred to by appellant I, is not pertinent to the case under appeal. In T 309/92, by contrast with the present case, the opposition division had in the course of the opposition proceedings introduced the ground for opposition under Art. 100(b) EPC of its own motion.

Thus, the grounds for opposition according to Art. 100(b) and 100(c) EPC constitute fresh grounds for opposition with respect to the patent as granted. Following G 10/91 (see OJ EPO 1993, 420), point 3 of the Opinion, such fresh grounds for opposition may be considered in appeal proceedings only with the approval of the patentee. Since the patentee has requested that they should not be allowed into the proceedings, the Board has no power to consider them.

Consequently, with respect to the main request, the grounds for opposition according to Art. 100(b) and 100(c) EPC and the parties' submissions based thereon are not admitted into the proceedings.

## 1.2 Novelty

Document A1 is directed to an anchoring arrangement restricting the bending of a pipe. Said arrangement comprises a first holding sleeve (15) secured to the pipe, said first holding sleeve being secured to the seabed via a connecting element. Document A1 specifies the connecting element as being a cable or tension anchor (cf. paragraph [0022] of document A1: "... *la liaison étant réalisée au moyen d'un câble ou d'un tirant d'ancrage ...*"), without further explicit details, either of the mechanical properties of the connecting element, or of the nature of its respective links to the first holding sleeve and the anchoring unit.

Regarding the above term "*câble*", it was not disputed that a cable is generally understood to have at least some degree of flexibility and is thus not considered a rigid element. Even assuming that "*câble*" and "*tirant d'ancrage*" refer to different technical solutions in the passage cited above, and independently of different possible translations, the term "*tirant d'ancrage*" likewise does not provide the skilled reader with an implicit but unambiguous teaching that the connecting element must be a rigid one.

In this context it is also noted that the rigidity of an element is an inherent mechanical property which depends rather on the element design and the material used than on the tension applied to it. Thus, the consideration that, when in use, the connecting element is subject to an undefined tensile force cannot lead to a conclusion on its inherent rigidity.

Consequently, in the Board's judgment, document A1 does not disclose a rigid main connecting element.

Turning to the issue of the mechanical coupling between the first and second holding sleeves, it first has to be assessed whether the set of articulated vertebrae of document A1 ("*vertèbres articulées*") can be seen as a mechanical coupling between the first holding sleeve (15) and the last, frustoconical vertebra, which appellant I considers a second holding sleeve within the meaning of the patent in suit.

Based on the dictionary excerpt A6, the adjective "articulées" used in paragraph [0026] of document A1 implies that the vertebrae are linked with each other and not arranged like a set of pearls on a string as suggested by appellant II. The Board therefore concludes that the set of vertebrae indeed forms a mechanical coupling between the first and second holding sleeves.

In a further step, it has to be clarified whether a mechanical coupling of such a kind also meets the claimed functional limitation of being suitable for coordinating the movement of the second holding sleeve with the movement of the connecting member. The purpose of the vertebrae of document A1 being articulated is to provide sufficient flexibility in order to reduce the effects of the movements of the tension anchor on the position of the section of the pipe lying on the seabed, or, in other words, to prevent a coordinated movement of said tension anchor and the last vertebra. Furthermore, the above consideration also holds true

if, as argued by appellant I, any other vertebra spaced apart from the first holding sleeve is considered the second holding sleeve in the terminology of the patent under dispute.

Consequently, document A1 does not disclose a mechanical coupling between the first and second holding sleeves such that the movement of the second holding sleeve is coordinated with the movement of the connecting member.

In summary, the subject-matter of independent claims 1 and 15 differs from the teaching of document A1 at least by the following features:

- the said first holding sleeve being pivotally secured via a rigid main connecting member to a main anchoring unit, and
- the mechanical coupling between the first and second holding sleeves being such that the movement of the second holding sleeve being coordinated with the movement of the rigid connecting member.

### 1.3 Inventive step

Document A1 is considered the closest prior art since it has the same intended use as and most structural features in common with the subject-matter claimed.

The subject-matter of independent claims 1 and 15 differs from the teaching of document A1 at least by the above-mentioned features.

In the judgment of the Board, the gist of the invention lies in the combination of the mechanical coupling

ensuring a coordinated movement of two holding sleeves and the rigid main connection member.

Using document A1 as a starting point, the skilled person would first have to replace the cable or tension anchor of document A1 by a rigid element. Even assuming, for the sake of argument, that such a replacement is a simple matter of choice, as argued by appellant I, it would not be possible without considering additional measures, in particular, an adaptation of the joints of the rigid element to the anchoring unit and to the first holding sleeve, respectively.

Moreover, the above modifications to the main connecting member and the joints would still not be sufficient to arrive at the subject-matter claimed. As a further step, the skilled person would also have to replace the set of vertebrae of document A1 by a different mechanical coupling between the first and second holding sleeves to ensure that the movement of the second holding sleeve was coordinated with the movement of the rigid connecting member.

The Board concludes that the required modifications would go beyond what a skilled person could be expected to consider based solely on his general knowledge, in particular since no respective motivation is apparent.

Providing such a coordinated movement of the first and second holding sleeves and a rigid main connecting element in order to restrict the bending of the pipe is also not known from, or suggested by, the prior art.

Regarding the differing features established above, the teaching of the first embodiment of document A2 is similar to that of document A1, namely to have a second holding sleeve lying on the seabed (see reference sign 10 in Fig. 4), thereby de-coupling it from the movements of the first holding sleeve (6). The second embodiment of document A2 shown in Fig. 7 suggests having the second holding sleeve (18) fixed to the seabed, which is contrary to the solution according to the present invention. Thus, document A2 rather leads the skilled reader away from the claimed solution.

Prior art documents A3 (specifically, Figs. 1 to 5) and A4 are directed to different configurations of sets of vertebrae principally known from document A1. These documents cannot put the inventive merit of the claimed subject-matter into question either, since, as stated above, bending restricting elements of such a kind are not considered suitable for ensuring a coordinated movement of the first and second holding sleeves. This also holds true for the floating structure disclosed in document A5.

Consequently, the prior art on file does not contain a teaching motivating the person skilled in the art to modify the apparatuses known from documents A1 or A2 in order to arrive at the claimed invention.

The subject-matter of independent apparatus claims 1 and 15 of the main request is therefore not obvious to the person skilled in the art, and hence involves an inventive step within the meaning of Article 56 EPC.

Likewise, the subject-matter of claims 2 to 14 and 16 to 18, which are dependent on claim 1 or 15, is based on an inventive step.

## **Order**

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

1. The appeal of appellant I is dismissed.
2. The decision under appeal is set aside and the patent is maintained as granted.

The Registrar:

The Chairman:

D. Meyfarth

W. Zellhuber