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Bezeichnung der Erfindung:
Title of invention:
Titre de l'invention : A system for a jack-up rig unit for offshore use and a method of securing the support legs of such a unit

Klassifikation / Classification / Classement : E02B 17/06

ENTSCHEIDUNG / DECISION

vom / of / du 17 January 1989

Anmelder / Applicant / Demandeur : -

Patentinhaber / Proprietor of the patent / Titulaire du brevet : Friede and Goldman Limited

Einsprechender / Opponent / Opposant : Hendrikus Gerardus Johannes de Bruijn

Stichwort / Headword / Référence : Jack-up rig unit

EPÜ / EPC / CBE : Art. 56 EPC

Schlagwort / Keyword / Mot clé : Inventive step (denied)

Leitsatz / Headnote / Sommaire

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Case Number : T 363/86 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 17 January 1989

Appellant : (Opponent)
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Decision under appeal :
Decision of Opposition Division ofthe European Patent Office dated 17 July 1986 rejecting the opposition filed against European patent No. 0 024 939 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : P. Delbecque
Members : R. Gryc
W. Moser

Summary of Facts and Submissions

I. European patent No. 0024939 comprising nine claims was granted to the Respondent on 7 March 1984 on the basis of European patent application No. 80 303 024.6 filed on 29 August 80 and claiming the priority of a previous US application of 29 August 1979.

The patent as granted comprises two independent Claims 1 and 7 which read as follows:

Claim 1:

"A system for a jack-up rig unit for offshore use, including at least one leg (2) with a set of rack teeth (14) fixedly connected thereto and disposed at least generally in a vertical direction along at least a substantial portion of the leg length, and a floatable hull (1) supportable above the water line on said leg(s) (2) comprising: locking means (7) carried by the hull (1) for each of said leg(s) (2) for locking the leg(s) (2) to said hull (1), said locking means (7) including laterally movable rack teeth-engaging means for engaging the rack teeth (14) of its respective leg (2) in its locking disposition but laterally movable with respect to said rack teeth (14) out of any engagement with said rack teeth (14) when it is desired to jack said leg(s) (2) up and down, characterised in that the locking means (7) for each leg (2) comprises at least three peripherally spaced rack chocks (7) each having a plurality of matching chock teeth arranged in a series so that when the rack chocks (7) are moved laterally into their locking disposition, the chock teeth of each rack chock (7) are rigidly interdigitated with the rack teeth (14) whereby the hull (1) and the

leg(s) (2) is rigidified without introducing any substantial bending moments in the leg(s) (2)."

Claim 7:

"A method of securing the support leg(s) (2) of an offshore jack-up rig unit having a hull (1), leg(s) (2) with rack teeth (14) and a jacking drive associated therewith, comprising the following steps:

(a) providing on said hull (1) a separate locking means (7) for each of said leg(s) (2) which is operationally separate and apart from said jacking drive (41), which locking means (7) have teeth-engaging portions which are at least laterally movable with respect to respective rack teeth (14) to engage therewith when in a locking disposition.

(b) vertically positioning the leg(s) (2) of the rig with respect to the rig hull (1) to the height desired by means of said jacking drive (41), and

(c) after the foregoing steps, laterally moving the lockings means (7) into locking engagement with its respective rack teeth (14) and locking all of said locking means (7) to said leg(s) (2), characterised in that the locking means (7) comprises at least three peripherally spaced rack chocks (7) having a plurality of matching chock teeth arranged in a series so that when the rack chocks (7) are moved laterally into the locking disposition, the chock teeth are rigidly interdigitated with the rack teeth (14) whereby the hull (1) and the leg(s) (2) is rigidified without introducing any substantial bending moments in the leg(s) (2)."

II. The Appellant filed an opposition against this patent and requested its revocation on the ground that the subject-matter of the patent is unpatentable under Articles 52-57 of the EPC, in particular that it is not novel and/or not inventive in view of the following documents:

(1) US patent 3 343 371
(2) British patent 934 369
(3) US patent 2 589 146
(4) US patent 4 033 571
(5) British patent 934 370
(6) US patent 3 606 251
(7) US patent 4 160 538

III. The Patentee contested the arguments of the Opponent and requested that the Opposition be rejected.

After considering the arguments put forward, the Opposition Division, by its decision dated 15 July 1986, rejected the opposition and maintained the patent unamended.

IV. On 12 September 1986, the Appellant filed an appeal against the decision, paying the appropriate fee simultaneously and requesting that the decision under appeal should be set aside and that the patent should be revoked in its entirety. The Statement of Grounds in Dutch was received on 14 November 1986, the translation of which was received on 3 December 1986.

Referring to the documents (1), (2), (3) and (5) together with a new document (8) GB-A-884 255 cited in reference (2), the Appellant contended that:

- One-part rack chocks must be considered to be at least implicitly shown to be old by ref. (1),

- Ref. (2) discloses a one-part chock which at least shows a rigid interdigitation of the teeth which forcibly results in the rigidification of the connection between the hull and the legs, and

- as far as the subject-matter of Claim 1 cannot be considered known from or obvious in view of the disclosure in ref. 1 alone, it is obvious in view of the disclosure in ref. (1) in combination with the disclosure in ref. (2) or in ref. (5), taking into consideration the reference made to ref. (8) which clearly relates to jack-up rig units.

V. In his submission of 16 April 1987, the Respondent contested the above arguments and raised the following main points:

- It is not an object of ref. (1) to provide a rigid connection without the introduction of bending moments,

- None of the prior art documents, and in particular neither ref. (2) nor ref. (5), is concerned with the problems of bending moments and rigidity.

The Respondent requested that the appeal be dismissed.

VI. In a communication pursuant to Art. 11(2) of the Rules of Procedure of the Board of Appeal dated 4 November 1988, the parties were invited to comment and to answer questions dealing with the interpretation of the subject-matter of the independent Claims 1 and 7 in the light of the description.

In a reply dated 16 December 1988, the Appellant contended that the specification as originally filed does not give any support for the invention as claimed in Claims 1 and 7.

In a submission dated 16 December 1988, the Respondent considered that the expression "rigidly interdigitated" in Claim 1 defines the arrangement clearly.

In addition, he contended that:

- Preloading is not essential but will ensure a contact between the teeth at all times,

- it is desirable, but not essential for the teeth engaging means to be vertically movable and,

- Claim 1 is not limited to a monolithic locking element.

As a subsidiary request he proposed to combine the granted Claims 1 and 2 in a new Claim 1 and granted Claims 7 and 8 in a new Claim 7, while renumbering and modifying dependencies of the remaining claims.

VII. During the oral proceedings held on 17 January 1989, the Appellant contended that the subject-matter of Claim 1 has to be considered as known either from ref. (1) or ref. (2) or (5), and, insofar as it would not be, it has to be considered as obvious having regard to a combination of the teachings of ref. (1) and (2) or (5).

He argued that the rigid interdigitation of the teeth and the rigidification of the binding without bending moments in the legs result from the provision of matching teeth

and of three rack chocks per leg, which provisions are fully known from ref. (1). Furthermore, since the provision of three rack chocks per leg is not considered as essential in the description, the Appellant also contended that this feature ought to be deleted from Claim 1; then ref. (2) and (5) would also become full anticipations since they disclose the provision of leg teeth and matching chock teeth and, as a direct result, a rigid interdigitation. He is also of the opinion that, starting from ref. (1), the substitution of a unitary rack chock known from ref. (2) or (5) for the separate teeth thereof cannot be seen as inventive.

The Respondent contested the arguments of the Appellant and expressed the views that:

- the invention lies in the definition of the problem,

- the systems known from the cited anticipations are all designed to take load only in one direction,

- ref. (1) is concerned with another problem having nothing to do with bending moments,

- a combination of the teachings of ref. (1) and (2) is not suggested and,

- even if they were combined, it would not be possible to rigidify the binding between hull and legs.

VIII. At the end of the oral proceedings both the Appellant and Respondent maintained their requests.

Reasons for the Decision

1. The appeal is admissible.

2. The main request is based on the claims as granted, which are supported by the application as filed, and the alternative claims, proposed by the Respondent as a subsidiary request, are combinations of some of said granted claims. Consequently, there are no formal objections under Art. 123 EPC to the claims submitted in accordance with both the main and auxiliary requests.

3. In accordance with the main request, the first question to be decided is whether the subject-matter of Claims 1 and 7 as granted and interpreted in the light of the description and drawings of the patent in suit is novel having regard to the cited references (1) to (8).

3.1 Ref. (1) discloses a system for a jack-up rig unit for offshore use showing all the features described in the preamble of Claim 1 as granted. Also, among all the documents cited during the proceedings, it is the only one which describes, in combination with these known features, the provision of locking means comprising three peripherally spaced rack chocks per leg, each having a plurality of chock teeth arranged in series.

Since, in Respondent's letter of 16 December 1988, page 2, paragraph 4, the provision of such locking means is said to be essential in view of obtaining the rigidification between hull and legs without introducing any substantial bending moments in the legs, ref. (1) appears to disclose the closest prior art.

3.2 As far as the interpretation of Claims 1 and 7 in the light of the description is concerned, the following should be said:

3.2.1 The general term "matching" in the expression "matching teeth" of Claims 1 and 7 is to be interpreted in relation to the definition of the relationship between the teeth in the locking position i.e. the rigid interdigitation which is said to be due to at least one tooth being engaged on both up and bottom surfaces and the surrounding teeth being engaged on either tops above and bottoms below or vice versa (see the Respondent's letter of 16 December 1988, page 2, paragraph 6, and also the description of the patent in suit col. 4, lines 53-59 and col. 5, lines 55-58).

3.2.2 The last sentence of Claims 1 and 7 beginning with the word "whereby" describes only the imperative result obtained by the provision of the aforementioned features and does not bring anything additional.

Therefore, this feature can be disregarded when appraising the patentability of the subject-matter of the claims.

3.3 Assessment of novelty.

3.3.1 When interpreted according to what is stated above under points 3.2.1 and 3.2.2, the subject-matter of Claim 1 as granted differs from the closest prior art described in ref. (1) mainly as regards the size and configuration of the rack and the chock teeth which provide in their locking position a rigid connection between the hull and the legs. Such a relationship between the teeth is neither described nor suggested in ref. (1).

On the contrary, referring to fig. 4 of ref. (1) which represents a locking device in its engaged and locked position, the following appears:

- The chock and rack teeth have not exactly the same size and profile; therefore, a full engagement of the chock teeth with the rack cannot be ensured even when turning the hand wheel (48) at its maximum,

- it cannot be clearly determined from the drawings if the clearance between the nose of the chock teeth and the bottom of the facing space between two consecutive rack teeth is larger than the horizontal clearance between the upper face of the chock teeth and the lower face of the rack teeth so as to permit said faces to contact each other and,

- the locking position of the chock teeth is positively determined by the location of stop bars which are engaged by the frame structure of the locking device (cf. col. 4, lines 43-46 of the description of ref. (1)) and prevent a further horizontal movement of the chock teeth toward the rack.

Consequently, the chock teeth arranged in a series according to ref. (1) cannot be considered as "matching teeth" in the sense of the invention and a rigid inter-digitation of these known teeth can obviously not be obtained.

Therefore, the subject-matter of Claim 1 is novel in comparison with the closest prior art described in ref. (1).

Since Claim 7 comprises the same distinguishing features, its subject-matter is also to be considered as novel with regard to ref. (1).

3.3.2 The alternative independent claims which form the basis of the subsidiary request are combinations of granted

Claims 1 and 7 with other claims. Consequently these alternative claims are also novel for the same above-mentioned reasons.

4. The question now to be considered is whether the subject-matter of the present Claim 1, when interpreted as mentioned above, still involves an inventive step.

4.1 The aim set by ref. (1) is to establish an accurately located joint between two structures with the joint being capable of withstanding heavy loads (cf. col. 6, lines 60-66). This is obtained by means of a uniform distribution of the loads over a plurality of teeth of the locking devices (cf. col. 1, lines 51-54).

The aim set by the present invention is the same, but the means of solution claimed in Claim 1 are different. Departing from the features distinguishing the subject-matter of Claim 1 from the closest prior art, the problem appears to reside in the search for a more simple locking means offering an improved connection between hull and legs.

Since the simplification of devices and the achievement of improvements through alternative solutions is a constant preoccupation of the skilled person and must be considered as his normal task, no contribution to the inventiveness of the solution can possibly seen in the perception of the aforementioned problem.

4.2 The disclosure in ref. (1) teaches a sophisticated solution to adjust each locking tooth to that position which effects proper engagement with the particular one of the teeth of the rack to which it is related. This known solution obviates the need for close machining tolerances. As opposed to this sophisticated solution, it is obvious

to the person skilled in the art that an alternative solution for obtaining proper engagement is to machine more closely the teeth of the locking devices so that each tooth would be able to match properly the particular one to which it is related without any individual adjustment of the teeth.

At the priority date, and in the same technical field, this more simple alternative solution was already clearly disclosed in ref. (5) referred to in ref. (2) which also incorporates the content of this document.

According to the disclosure of ref. (5), the locking devices, used to lock the hull and the legs of the platform described in ref. (2), comprise chock teeth which are sized and configured so that full engagement with the rack teeth can be ensured (cf. ref. (5), p. 2, lines 9, 10), and when the chocks and racks are so locked, relative movement of said parts in at least one direction is prevented (cf. ref. (5), page 1, lines 17-20).

4.3 The person skilled in the art is expected to consult, at least in the same technical field, the relevant prior art for devices which perform the same function and are better able to meet the requirements. Such consultation would reveal ref. (2) and (5) in which the skilled person would find locking devices capable of solving his problem. Consequently, he would naturally be led to replace each sophisticated locking device of ref. (1) with the simple one described in ref. (5) and, thus, arrive at the subject-matter of Claim 1.

4.4 As the Respondent explicitly stated that the expression "rigid interdigitated" defines clearly the arrangement and does, inter alia, not necessitate preloading, and as the expression did not seem to necessitate any other

precisions out of the description (see Respondent's letter of 16 December 1988 in response to the communication of the Board dated 4 November 1988, cf. point VI of the Facts and Submissions) that expression cannot be understood in a different way than the expression "full locking engagement" in column 2, lines 18-19 of ref. (5) mentioned in ref. (2).

4.5 For the foregoing reasons, the subject-matter of Claim 1 as granted lacks an inventive step as required by Art. 56 EPC and the claim cannot be allowed having regard to Art. 52(1) EPC.

5. The alternative Claim 1 according to the subsidiary request is a combination of Claims 1 and 2 as granted.

Since the locking devices disclosed in ref. (5) comprise also the characteristics of Claim 2 as granted, the addition of these features to those of the present Claim 1 does not imply any inventive step for the same reasons given under paragraph 4.3.

Therefore, the alternative Claim 1 can neither be allowed having regard to Art. 52(1) EPC.

Order

For these reasons, it is decided that:

1. The decision of the Opposition division is set aside.

2. The European patent no. 0 024 939 is revoked.

The Registrar: The Chairman:

S. Fabiani P. Delbecque