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File No.: T 0602/92 - 3.4.2

Application No.: 89 300 924.1

Publication No.: 0 328 288

Classification: G01M 3/28

Title of invention: Method and apparatus for externally and internally testing for leaks in connections between tubular members

D E C I S I O N

of 10 August 1993

Applicant: Hasha, Brian B., et al

Proprietor of the patent:

Opponent:

Headword:

EPC: Art. 123(2), 84, 54 and 56

Keyword: "after amendments: additional subject-matter (no); clarity, novelty, inventive step (yes)"

**Headnote
Catchwords**

Case Number: T 0602/92 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 10 August 1993

Appellant: Hasha, Brian B.
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Representative: Smith, Norman Ian
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Decision under appeal: Decision of the Examining Division of the European Patent Office dated 12 February 1992 refusing European patent application No. 89 300 924.1 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: E. Turrini
Members: M. Chomentowski
J.C. Saisset

Summary of Facts and Submissions

- I. European patent application No. 89 300 24.1 (publication No.0 328 288) was refused on the grounds that some of the claims were not clear and that the subject-matter of apparatus claims was not novel having regard to US-A-4 136 552 or did not involve an inventive step having regard additionally to DE-A-3 407 498.
- II. The Appellant (Applicant) filed an appeal against this decision. It requested that the decision under appeal be rectified and that a patent be granted on the basis of a revised set of claims concerning only a method of testing pipe connections. Moreover, it requested oral proceedings auxiliary.
- III. In the communication dated 23 February 1993 the Board of Appeal expressed the opinion that, starting from US-A-4 136 552, the subject-matter of the current Claim 1 in one of the alternative forms thereof, appeared to lack novelty and, in the other alternative form thereof, appeared to lack an inventive step. However, the Board proposed a new text of the application which could be allowable. The proposed Claim 1 reads as follows:
- "1. A method for hydrostatically testing connections between segments (10, 12) of pipe, which comprises applying pressurised hydrostatic test fluid to the connection characterised by: selectively applying the pressurised hydrostatic test fluid such that the pressures are principally applied to a selected localised small area in the immediate vicinity and on

either side of the radial orifice (56) leading into the sealing elements (18, 20) of the connection under test and such that there is no substantial test pressure applied radially to the inner or outer annular surfaces of the connection in the vicinity of at least one of the sealing elements of the connection under test which pressure would tend to substantially affect the bearing pressure of that sealing element or elements."

Claims 2 to 8 are dependent claims.

- IV. In the letter dated 13 July 1993, the Appellant approved the text proposed by the Board.

- V. The Appellant submitted the following arguments in support of its requests: In the presently claimed method, no substantial test pressure is applied radially to the inner or outer annular surfaces of the connection between the pipes in the vicinity of at least one of the sealing elements of the connection under test. Thus, said sealing element is not affected by the test pressure. Therefore, the method of present Claim 1 involves an inventive step.

Reasons for the Decision

- 1. The appeal is admissible.

- 2. Allowability of the amendments
 - 2.1. Present Claim 1 is based on independent Claim 2 as originally filed, but without the original features

concerning the treatment of the generated test data, which is not an essential part of the invention. Present Claim 1 comprises additional features concerning a more specific definition of the location of application of the test pressure, i.e. in the immediate vicinity and on either side of the radial orifice, which are based on all the embodiments of the application as filed (see for instance page 17, line 31 to page 20, line 11; Figure 3). Therefore, with the text of present Claim 1, the European patent application has not been amended in such a way that it contains subject-matter which extends beyond the content of the application as filed (Article 123(2) EPC).

3. *Clarity*

- 3.1. Present Claim 1 specifies that the orifice is radial, as in all the disclosed embodiments in the patent application. In the presently claimed method, pressurised hydrostatic test fluid is principally applied to a selected localised small area in the immediate vicinity and on either side of the radial orifice 56) leading into the sealing elements (18, 20) of the connection under test. The relative terms such as "small" specify that the test area is small as compared to the area of the connection. Thus, the sealing elements comprised in the connection can be at a location wherein, as mentioned in the claim, there is no substantial test pressure applied radially to the inner or outer annular surfaces of the connection in the vicinity of at least one of the sealing elements of the connection under test which pressure would tend to substantially affect the bearing pressure of that sealing element or elements. Indeed, it is to be noted

that a further manipulation of the bearing pressure at other locations of the connection can be effected. However, as credibly argued by the Appellant, said manipulation is independent from and not affected by the introduction of testing fluid in the test chamber; said manipulation is supplementary to this last test and allows to simulate the pressures encountered during operational life of the pipe joint (see for instance page 24, line 6 to page 25, line 2; Figure 5). Therefore, present Claim 1 is clear and supported by the description in the sense of Article 84 EPC.

4. *Novelty*

4.1 A method for hydrostatically testing connections between segments (17a, 18b) of pipe, which comprises applying pressurised hydrostatic test fluid to the connection, is known from US-A-4 136 552 (see column 2, line 66 to column 3, line 22; column 4, lines 4 to 26; column 7, lines 3 to 55; column 7, line 66 to column 8, line 32; Figure 1 and 3); in particular, it is directly and unambiguously derivable from Figure 3 of US-A-4 136 552 that the pressurised hydrostatic test fluid is selectively applied through the passage means (74) such that the pressures are principally applied to a selected localised area extending between the seal means (70, 71) which isolate a chamber (20a) in the vicinity of the orifice leading into the sealing elements of the connection under test, which connection includes an internal and an external seal. However, contrary to the presently claimed method, in the known method the selective area wherein the pressurised hydrostatic test fluid is applied is not small as compared with the area of the connection under test, and the pressure is also applied to a selected

localised area which is not in the immediate vicinity of the radial orifice leading into the sealing elements of the connection under test.

4.2. The other prior art documents are less relevant.

4.3. Therefore, the subject-matter of present Claim is novel in the sense of Article 54 EPC.

5. *Problems of the prior art and object of the invention*

5.1. According to the present application (see page 3, line 3 to page 6, line 16), there is a likelihood that a connection between pipe segments will leak when subjected to relatively low hydrostatic pressure encountered during normal operational life of the pipe, but will not be identified during the hydrostatic testing procedure; indeed, depending upon the design of the sealing surfaces of the connection and the relative thickness of the mating sealing surfaces, whether pressure is applied internally or externally, the bearing pressure between connection's sealing surface may change significantly. This remark is particularly useful in testing for leaks in a connection between casing or other types of tubing wherein the bearing pressure of the connection is sensitive to the pressure applied by the leak testing apparatus itself, such as in the "HYDRIL" type of connection known from Figure 3 of US-A-4 136 552 (see column 7, lines 3 to 7), whereby the area of pressure application in the chamber (20a) is not small as compared with the area of the connection between the pipe segments (17a, 18b). The presently claimed test method for predicting a connection's sealing capability credibly solves this problem in that it

affects the connection's sealing bearing surface the least per unit of applied pressure.

6. *Inventive step*

6.1 The problem is not derivable from US-A-4 136 52. Indeed, in another example of US-A-4 136 552 (see column 4, line 27 to column, line 27; Figure 2), a more limited area for the application of test pressure can be used by engaging the intermediate seal means (40) in the chamber (20a). However, said limited area of application of test pressure is still about one half of the total area of connection (19) and, moreover, is disclosed in relation with a "non-upset" coupling type coupling connection, i.e. different from an "upset" type coupling type connection of Figure 3 of the same US-A-4 136 552 and thus not reacting in the same way to the application of test pressure. The other prior art documents do not provide more indications about the problem and its solution. In particular, in the test method of DE-A-3 407 498 (see in particular page 19, second paragraph and Figure 2), the test area is not small as compared with the area of the connection between the pipe segments (10a, 10b) and, moreover, said connection uses a rubber ring, i.e. quite different from a connection wherein the coupling is dependent from the area of applied test pressure.

6.2. Therefore, the subject-matter of present Claim 1 involves an inventive step in the sense of Article 56 EPC.

7. Since present Claims 2 to 8 are dependent claims, they also involve an inventive step for the same reasons.

8. Therefore, the present claims are allowable (Article 52(1) EPC) and, thus, a patent may be granted (Article 97(2) EPC).
9. Since the Appellant agreed with the text proposed by the Board, oral proceedings were not necessary.

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 documents approved by the Appellant with letter dated 13 July 1993 and consisting of:

Description: Pages 2 to 4, 4a, 5 to 8, 8a and 9 to 39,
and Claims: Numbers 1 to 8, as proposed by the Board of Appeal with communication dated 23 February 1993, and Drawings: Sheets 1/16 to 16/16 as originally filed.

The Registrar:

The Chairman:

P. Martorana

E. Turrini