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**Datasheet for the decision
of 30 January 2024**

Case Number: T 1456/21 - 3.2.01

Application Number: 13766619.4

Publication Number: 2898183

IPC: E21B47/13

Language of the proceedings: EN

Title of invention:
DOWNHOLE COMMUNICATION

Patent Proprietor:
Expro North Sea Limited

Opponent:
HGF Limited

Headword:

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
Novelty - (yes)
Inventive step - (yes) - ex post facto analysis

Decisions cited:

Catchword:



Beschwerdekammern
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Case Number: T 1456/21 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 30 January 2024

Appellant:

(Opponent)

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Decision under appeal:

**Interlocutory decision of the Opposition
Division of the European Patent Office posted on
23 June 2021 concerning maintenance of the
European Patent No. 2898183 in amended form.**

Composition of the Board:

Chairman G. Pricolo
Members: M. Geisenhofer
 S. Fernández de Córdoba

Summary of Facts and Submissions

- I. The appeal was filed by the opponent against the interlocutory decision of the opposition division finding that, on the basis of the auxiliary request 10, the European patent EP 2 898 183 met the requirements of the EPC.
- II. With regard to this request, the opposition division decided that the subject-matter of claims 1, 9 and 10, respectively, was novel and inventive.
- III. The following documents were referred to by the parties:
- | | |
|----|--------------------|
| E2 | US 5 945 923 A |
| E4 | US 2008/0264633 A1 |
- IV. Oral proceedings were held before the Board.
- (a) The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked.
- (b) The respondent (patent proprietor) requested that the appeal be dismissed, i. e. that the patent be maintained based on auxiliary request 10 upheld by the opposition division (main request), in the alternative that the patent be maintained in amended form based on the auxiliary request filed with the reply to the statement of grounds of appeal.
- V. Independent **claim 1** according to the main request reads as follows:

"A well installation communication system comprising downhole metallic structure (2) and a downhole communication unit (3), the downhole communication unit (3) configured to communicate electrical signals into and along the downhole metallic structure (2) towards surface, and a surface communication unit (4) arranged for electrical signal communication with the downhole communication unit (3), the well installation communication system further comprising a cable (5) and a connection device (6) being removeably deployable in the down hole metallic structure (2), the connection device (6) being electrically disconnectably and reconnectably connectable to the downhole metallic structure (2), and having a connector portion (63) to which an end of the cable (5) is mechanically and electrically connected, the cable (5) and connection device (6) configured such that, when deployed and electrically connected in the downhole metallic structure (2) a signal channel is formed comprising:

- a portion of the downhole metallic structure (2) and
- a portion of the cable (5) running within the downhole metallic structure (2) away from said portion of the downhole metallic structure (2) towards the surface,

that signal channel providing better signal characteristics at the surface communication unit (4) than when signals would otherwise travel all the way between the downhole communication unit (3) and the surface communication unit (4) along the downhole metallic structure (2), in which the connection device (6) provides mechanical contact between the cable (5) and the portion of downhole metallic structure (2), in which the cable (5) is a coaxial cable with a core conductor (52) and a surrounding shield conductor (53)

and the connection device (6) is arranged to electrically connect the core conductor (52) to the portion of metallic structure (2), wherein the core conductor (52) is connected to local earth by the connection device (6)."

The main request comprises a further independent **claim 9** which reads as follows:

"A method of electrical signal communication in a well installation comprising a downhole metallic structure (2) and a downhole communication unit (3) configured to communicate electrical signals into and along the downhole metallic structure (2) towards surface, the downhole communication unit (3) being arranged for transmitting and/or receiving signals via the downhole metallic structure (2), the method comprising the steps of:

introducing a connection device (6) carried by a portion of cable (5) into the well from the surface so as to run the cable (5) within the downhole metallic structure (2) and position the connection device (6) in the downhole metallic structure (2) at a down hole location and electrically connect the connection device (6) to a portion of the downhole metallic structure (2), the connection device having a connector portion (63) to which an end of the cable (5) is mechanically and electrically connected, the cable (5) and connection device (6) configured such that, when deployed and electrically connected in the downhole metallic structure (2) a signal channel is formed comprising a portion of the downhole metallic structure (2) and a portion of the cable (5) running within the downhole metallic structure (2) away from said portion of the downhole metallic structure (2) towards the surface;

electrically connecting another end of the portion of the cable (5) to a surface communication unit (4); and signalling between the down hole communication unit (3) and a surface communication unit (4) via the resulting signal channel, that signal channel providing better signal characteristics at the surface communication unit (4) than when signals would otherwise travel all the way between the downhole communication unit (3) and the surface communication unit (4) along the downhole metallic structure (2), in which the connection device (6) provides mechanical contact between the cable (5) and the portion of downhole metallic structure (2), in which the cable (5) is a coaxial cable with a core conductor (52) and a surrounding shield conductor (53) and the connection device (6) is arranged to electrically connect the core conductor (52) to the portion of metallic structure (2), and wherein the core conductor (52) is connected to local earth by the connection device (6)."

The main request also comprises the following further independent **claim 10**:

*"Apparatus for use in a well installation communication system according to any one of claims 1 to 7, comprising:
a portion of cable (5);
a downhole communication unit (3);
a surface communication unit (4) arranged for electrical signal communication with the downhole communication unit (3) via a signal channel including a portion of downhole metallic structure (2) and the portion of cable (5), the downhole communication unit (3) configured to communicate electrical signals into*

and along the downhole metallic structure (2) towards surface;
a connection device (6) for connection in between the portion of metallic structure (2) and the portion of cable (5), the connection device (6) being electrically connectable to the metallic structure (2) and having a connector portion (63) to which an end of the cable is mechanically and electrically connectable, the cable (5) and connection device (6) configured such that, when deployed and electrically connected in the downhole metallic structure (2) a signal channel is formed comprising a portion of the downhole metallic structure (2) and a portion of the cable (5) running within the downhole metallic structure (2) away from said portion of the downhole metallic structure (2) towards the surface, that signal channel providing better signal characteristics at the surface communication unit (4) than when signals would otherwise travel all the way between the downhole communication unit (3) and the surface communication unit (6) along the downhole metallic structure (2),
in which the connection device (6) provides mechanical contact between the cable (5) and the portion of downhole metallic structure (2),
in which the cable (5) is a coaxial cable with a core conductor (52) and a surrounding shield conductor (53) and the connection device (6) is arranged to electrically connect the core conductor (52) to the portion of metallic structure (2), and
wherein the core conductor (52) is connected to local earth by the connection device (6)."

VI. The appellant's arguments relevant for the present decision can be summarised as follows:

- (a) The opposition division erred when admitting the main request.
- (b) The subject-matter of claim 1 of the main request was neither novel over E2, nor over E4. The same applied to the subject-matter of claims 9 and 10, respectively.
- (c) The claimed subject-matter was at least not inventive starting from either of E2 or E4.

VII. The respondent's relevant arguments can be summarised as follows:

- (a) The opposition division correctly applied their discretion when admitting the main request.
- (b) The subject-matter of claims 1, 9 and 10 was novel since both E2 and E4 lacked a core connector of the coaxial cable being connected to local earth. Furthermore, the connection device of E4 was not removably deployable to the downhole metallic structure, in particular not disconnectably and reconnectably connectable to it.
- (c) It was also not obvious to connect the core conductor of the cables of E2 or E4 to local earth.

Reasons for the Decision

Admissibility of the main request

1. The respondent filed the main request (then auxiliary request 10) during oral proceedings before the

opposition division such that the opposition division had to decide on its admissibility.

1.1 The opposition division held (cf. reasons for the decision 43) that this request was a bona fide attempt to overcome the previous objections and admitted the request. Furthermore, they noted that this request was based on a combination of granted claims 1, 2, 4 and 6.

1.2 The appellant disagrees with this decision arguing that the respondent already had a plurality of possibilities to remedy the outstanding defects of their patent such that the late filing of the request should not have been allowed by the opposition division. Furthermore, the request did not converge with higher ranked requests such that they were surprised by the particular combination of granted claims.

1.2.1 It is established case law that, on appeal against a decision taken by a department of first instance in exercise of its discretion, it is not for the Board to review all the facts and circumstances of the case as if it were in that department's place and decide whether or not it would have exercised discretion in the same way.

A Board should overrule the way in which an opposition division exercised its discretion in reaching a decision in a particular case only if they conclude that the opposition division did so in accordance with the wrong principles, without taking the right principles into account or in an arbitrary or unreasonable way, thereby exceeding the proper limits of its discretion.

- 1.2.2 In the present case, the opposition division admitted the request using the criteria of
- prima facie allowability (deeming the amendments a bona fide attempt to remedy all outstanding issues),
 - procedural expediency and
 - reasonable expectation that the opponent could familiarise themselves with the proposed amendments in the time available (deeming the amendments being based on a combination of granted claims to which the opponent must have been prepared).

They thus used the correct criteria when exercising their discretion (cf. Case law of the Boards of Appeal, 10th edition, IV-C-5.1.4 d)) and applied these criteria in a reasonable way.

- 1.3 The Board hence sees no reason for overruling the opposition division's discretionary decision to admit the main request.

Novelty

2. The subject-matter of independent claims 1, 9 and 10, respectively, is novel (Article 54 EPC).
- 2.1 All three claims require that "*the core conductor (52) is connected to local earth by the connection device (6)*".
- 2.2 Document E2 discloses in figures 1 and 2 a well installation communication system with a downhole communication unit (1) connected to a surface communication unit. The downhole communication unit (1) emits a signal into an inner pipe (4) within the borehole. This signal is transmitted to a connection

device ("shuttle" 2) arranged within the pipe (4) that further transfers it via a cable (3) to the surface communication unit.

Cable (3) is a coaxial cable with a core conductor and a surrounding shield conductor (cf. column 2, lines 24/25: "coaxial conductors and an external metal armoring").

2.2.1 However, in E2, the core conductor is not clearly and unambiguously connected to local earth by the connection device.

(a) The appellant argues that the inner pipe (4) within the casing ("string" 16) was connected via the packers (6) to the surrounding formation, i. e. to local earth. Since the shuttle (2) was in turn contacting the inner pipe (4) with the electric contact (18) as set out in column 4, lines 51 - 53, the core conductor of the cable (3) was connected to local earth.

(b) In the Board's view, the fact that the inner pipe (4) is mechanically held by packers (6) within the casing (16) does not necessarily imply that the inner pipe is clearly and unambiguously on the same electrical potential as the casing, and in particular not necessarily on an electrical potential being identical to local earth. On the contrary, it is likely that the casing and the packers will have a certain resistance such that the inner pipe will not be on the same electrical potential as the surrounding formation.

(c) Furthermore, an electrical contact between the shuttle (2) and the pipe (4) does not imply that

the core conductor of the cable running from the shuttle (2) to the surface is directly connected to the pipe (4) and hence on the same potential as the pipe (4). On the contrary, shuttle (2) is described in E2 to be a "second transmitter/receiver unit" (column 4, line 51) such that it must be assumed that the shuttle taps the (first) signal from the inner pipe to process it into a (different/second) signal that is then introduced into the cable (3) and conveyed to the surface. The cable's core conductor hence is not directly connected to the casing but some electronic components are joined up in circuit such that it cannot be clearly and unambiguously derived that the core connector of the cable is connected to local earth by the connection device.

- 2.3 Document E4 discloses a similar installation with a casing (S1) and an inner pipe (S2) being held within the casing by packers (P). The downhole communication unit (5) emits a signal into the inner pipe (S2), which signal is transmitted to a connection device ("pressure gauge" 2) arranged on the inner pipe (4) and further via cable (3) to the surface communication unit (4). As set out in paragraphs [0098] and [0099], a switch mechanism in the connection device (2) can be provided to allow direct connection between surface communication unit (4) and downhole communication unit (5), the switch mechanism hence bypassing the circuitry (21) in the connection device (2),

The cable (3) is a coaxial cable with a core conductor and a surrounding shield conductor (cf. paragraph [0005]).

2.3.1 However, also in E4, the core conductor of the cable (3) is not clearly and unambiguously connected to local earth by the connection device.

(a) The appellant argues similarly to E2 that the inner pipe (S2) of E4 was connected via the packers (P) and the casing (S1) to the surrounding formation, i. e. to local earth. The inner pipe (S2) hence was at a potential identical to local earth.

(b) As explained with regard to E2, due to the packers being arranged between the casing and the inner pipe it is not possible to clearly and unambiguously derive that the inner pipe (S2) is at a potential identical to local earth.

2.4 The subject-matter of claim 1 hence at least distinguishes over E2 and E4, respectively, by the core conductor being connected to local earth by the connection device.

The same applies to the subject-matter of claims 9 and 10, respectively.

Accordingly, the claimed subject-matter is novel and in this context there is no need to establish whether there are further differences between the subject-matter of claim 1 and the systems known from documents E2 and/or E4.

Inventive step

3. The subject-matter of independent claims 1, 9 and 10, respectively, is not rendered obvious by the prior art (Article 56 EPC).

- 3.1 The appellant argues starting from either E2, or from E4 as closest prior art.
- 3.2 The subject-matter of all three independent claims differs from the systems of E2 and E4, respectively, at least in that the core conductor of the cable connecting the connection device with the surface communication unit is connected to local earth by the connection device (as set out with regard to novelty).
- 3.3 The skilled person has no teaching at hand that would induce connecting the core connectors of E2 and/or E4 to local earth.
 - 3.3.1 The appellant argues only that the inner pipes of E2 and E4 are connected to local earth such that any electrical contact between the connection device and the inner pipe will inevitably result in the core connector of the cable being connected to local earth.
 - 3.3.2 As set out above with regard to novelty, it cannot be assumed that the potential of the inner pipes in E2 and E4 is equivalent to local earth such that the appellant's reasoning is not convincing.
 - 3.3.3 On the contrary, the skilled person knows from his common general knowledge that when using a coaxial cable the shielding of this cable is normally earthed to avoid any interferences of the signal, but not its core conductor.
- 3.4 The Board therefore has no reason to deviate from the opposition division's decision on novelty and inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated