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**Datasheet for the decision
of 13 December 2022**

Case Number: T 0678/21 - 3.2.01

Application Number: 11779923.9

Publication Number: 2771542

IPC: E21B44/00, E21B47/00

Language of the proceedings: EN

Title of invention:

METHODS AND SYSTEMS FOR PROVIDING A PACKAGE OF SENSORS TO
ENHANCE SUBTERRANEAN OPERATIONS

Applicant:

Halliburton Energy Services, Inc.

Headword:

Relevant legal provisions:

EPC Art. 84, 123(2)

Keyword:

Claims - clarity - main request (no) - clarity - auxiliary
request (no)
Amendments - added subject-matter (yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0678/21 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 13 December 2022

Appellant: Halliburton Energy Services, Inc.
(Applicant) 10200 Bellaire Boulevard
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Representative: Hoffmann Eitle
Patent- und Rechtsanwälte PartmbB
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 19 January 2021
refusing European patent application No.
11779923.9 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: M. Geisenhofer
P. Guntz

Summary of Facts and Submissions

- I. The appeal was filed by the applicant (appellant) against the decision of the examining division to refuse the patent application in suit.
- II. The examining division decided that neither claim 1 of the main request, nor claim 1 of the 1st auxiliary request complied with the requirements of Article 84 and 123(2) EPC.
- III. Oral proceedings were held before the Board.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request as submitted with the letter dated 19 July 2019 or, in the alternative, on the basis of the 1st auxiliary request as submitted with the letter dated 13 October 2020 or on the basis of the 2nd auxiliary request as submitted with the statement of grounds of appeal.

- IV. Claim 1 of the **main request** reads as follows:
*"An integrated system for enhancing the performance of subterranean operations, comprising:
an integrated control system configured to monitor one or more subterranean operations, the integrated control system comprising a centralized functional unit (214) communicatively coupled to one or more functional units (202, 204, 206, 208, 210, 212); and
a package of sensors (175) communicatively coupled to the at least one functional unit and the centralized functional unit is configured to receive data from the package of sensors corresponding to the at least one functional unit,*

in which system the package of sensors is uniformly deployed, and configured to generate data from the at least one functional unit, to enhance the subterranean operations by the package of sensors automating data collection, the centralized functional unit being configured to process and combine the data to identify metrics."

Claim 1 of the **1st auxiliary request** requires in addition thereto that the system comprises *"a package of force sensors (175) comprising one or more force sensors, coupled to a drill string and configured to experience a force, strain or stress field proximate to the drill string, and other force sensors coupled so as not to experience all of the force, strain or stress field experienced by the first-mentioned one or more force sensors", and that "the package of sensors communicatively coupled to the at least one functional unit" is "the package of force sensors".*

Claim 1 of the **2nd auxiliary request** is based on claim 1 of the main request whereby the term *"in which system the package of sensors is uniformly deployed"* is replaced by *"which system includes a deployed uniform package of sensors"*.

V. The appellant's arguments can be summarized as follows:

(a) The expression *"package of sensors is uniformly deployed"* used in claim 1 of the **main request** and of the **1st auxiliary request** was sufficiently clear. It referred to sensors being arranged at common intervals within a pattern as shown in figure 1 of the application.

- (b) This feature was disclosed in the application as originally filed on page 2, first paragraph.
- (c) The expression "*deployed uniform package of sensors*" used in the **2nd auxiliary request** was equivalent to the expression used in the main and 1st auxiliary requests and hence was also clear. It was however even closer to the expression used on page 2 of the originally filed description to remedy a possible unallowable amendment.

Reasons for the Decision

Main request and 1st auxiliary request

- 1. The examining division concluded that claim 1 of the main request does not comply with the requirements of Article 84 EPC since the term "*package of sensors is uniformly deployed*" is not clear.
 - 1.1 The board shares this view for the following reasons:
 - 1.1.1 It is not clear whether this expression refers to the package itself being uniformly deployed, or whether it refers to the sensors of the package being uniformly deployed in use.
 - 1.1.2 If one assumes that reference is made to the package itself being uniformly deployed, it remains unclear how such a uniform deployment is achieved. The uniform deployment of the package of sensors might be understood as requiring an arrangement of identical sensors within the package or to connecting the sensors in a uniform manner within the package, e.g. with wiring of identical length. The expression, however,

could also be understood to require the sensors to be attached one to another in a symmetrical manner within the package.

- 1.1.3 If one assumes instead that reference is made to the sensors being uniformly deployed in use, it is not clear what is a "uniform" deployment, in the sense that it is not clear whether uniform relates to the kind of sensors, or to their connections, or to their physical arrangement within the package or rather in use. For instance, sensors could be considered as being uniformly deployed not only if they were all spaced at common intervals along the drill string, as argued by the appellant, but also if not spaced at common intervals but being all identical and with same wiring connections.
- 1.1.4 The skilled person hence is not in a position to determine unequivocally when a package of sensors is to be considered as being uniformly deployed.
- 1.2 The appellant argued that the skilled person would understand from the expression "*package of sensors is uniformly deployed*" that the sensors of the package are arranged with a common uniform spacing between one another, not between the package and another, non-specified feature.
- 1.2.1 However, as explained above, even if the expression is understood as referring to the deployment of the sensors, it cannot be regarded as referring unequivocally to a common-interval spacing between them. Nor is such interpretation supported by the description.

Firstly, the description only once refers on page 2, line 7, to a need "*to deploy a uniform package of sensors*", without further specifying what this means.

Secondly, a common-interval spacing cannot be derived from the figures, as argued by the appellant at the oral proceedings, as the figures are schematic and as, anyway, sensors 312 in Fig. 3 specifically referred to by the appellant are

- (i) at different intervals (one sensor 312 is at the tip of the drillpipe whilst the others are along the drillpipe 310) and
- (ii) the sensors might be of different types (see page 11, last paragraph) such that there is no apparent reason to have them at common intervals.

1.2.2 In this respect, the argument of the appellant that force sensors, being of the same type, would clearly be spaced at common intervals, fails to convince not only in view of the fact that other sensors than force sensors are contemplated in the description and in the claim, but also in view of the fact that there is no reason why a skilled person would necessarily locate identical force sensors at common intervals. There may well be other technical constraints requiring the location of force sensors at different intervals (e.g. in the proximity of critical portions).

1.2.3 The Board notes that the description discloses an embodiment in which elements of a set of sensor devices are spaced substantially equally around the circumference of a drill string component (page 7, lines 19 - 21). This is however a specific example referring to the sensors of a set and not to the whole package of sensors.

2. The examining division further concluded that claim 1 of the main request does not comply with the requirements of Article 123(2) EPC since the term "*package of sensors is uniformly deployed*" lacks disclosure in the application as originally filed.
- 2.1 The board also shares this view for the following reasons:
- 2.2 The description as originally filed only discloses on page 2, line 7 the expression "*to deploy a uniform package of sensors*". Deploying a uniform package is, however, different to uniformly deploying a package of sensors. In the passage on page 2 of the originally filed description, the package as such is uniform (in the sense of a characteristic of the package) whereas in claim 1 of the main request the deployment is uniform (in the sense of specifying the action of deployment).
3. The above explained deficiencies of the main request also apply *mutatis mutandis* to the first auxiliary request which contains the same expression "*package of sensors is uniformly deployed*" in claim 1.

2nd auxiliary request

4. The appellant filed a 2nd auxiliary request with the statement of grounds of appeal in which the term "*package of sensors is uniformly deployed*" in claim 1 of the main request is replaced by the term "*system includes a deployed uniform package of sensors*", allegedly in order to "*conform even more closely to the wording found in the originally-filed application*" (see

page 9, lines 1-4 of the statement of grounds of appeal). The amendment thus aims exclusively at removing the lack of compliance with Article 123(2) EPC.

- 4.1 This replacement term, however, is still not clear. In the board's view, the replacement term does not overcome the concerns of lack of clarity discussed herein above for the main request. In particular, by stating that the package of sensors is a "*deployed uniform*" package it is unclear what is to be understood as a uniform package of sensors (same types of sensors, same wiring of sensors of different types, similar packaging, other similarities ?).
- 4.2 It hence can be left undecided whether the 2nd auxiliary request could be admitted into the proceedings since in any case, the request is not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Voyé

G. Pricolo

Decision electronically authenticated