Patents Act 1977 **Opinion Number** **13/22**

OPINION UNDER SECTION 74A

Patent	GB 2506123 B
Proprietor(s)	Expro North Sea Limited
Exclusive Licensee	
Requester	Metrol Technology Limited (represented by HGF Limited)
Observer(s)	Expro North Sea Limited (represented by Marks & Clerk LLP)
Date Opinion issued	11 July 2022

The request

1. The comptroller has been requested to issue a validity opinion in respect of patent GB 2506123 B (the patent). The request asks (i) whether the protection conferred by the patent has been extended by an amendment which should not have been allowed and (ii) whether the invention for which the patent has been granted is not new or does not involve an inventive step. The prior art documents referred to in the request are as follows:

E1 - US 2008/308271 A1 (CHOUZENOUX), published 18 December 2008

E2 - US 5945923 A (SOULIER), published 31 August 1999

E3 - "From Liability to Cost Effective Data Gathering Opportunity", Quint et al, SPWLA 46th Annual Logging Symposium, June 26-29, 2005

E4 - US 2008/264633 A1 (HUDSON), published 30 October 2008

E5 - "Reliability Evolution of Permanent Downhole Gauges for Campos Basin Sub Sea Wells: A 10-Year Case Study", Frota et al, SPE 102700, 24-27 September 2006

Observations

2. Observations were received on 18 May 2022 and observations in reply were received on 26 May 2022.

Matters to be considered by this Opinion

3. Section 74A of the Patents Act provides for the procedure where the Comptroller can issue, on request, non-binding opinions on questions of validity and on questions of infringement.

4. Section 74A(3) of the Patents Act states:

> *The comptroller shall issue an opinion if requested to do so under subsection (1) above, but shall not do so –*
>
> *(a) in such circumstances as may be prescribed, or*
>
> *(b) if for any reason he considers it inappropriate in all the circumstances to do so.*

5. Rule 94(1)(b) of the Patents Rules 2007 provides that:

> *The comptroller shall not issue an opinion if the question upon which the opinion is sought appears to him to have been sufficiently considered in any relevant proceedings.*

6. Relevant proceedings are defined in Rule 92 as proceedings (whether pending or concluded) before the comptroller, the court, or the European Patent Office.

7. Document E1 above was cited during pre-grant examination of the patent application, specifically in the Examination Reports under Section 18(3) dated 8 November 2018 and 3 April 2019. Therefore, it would not be appropriate in the circumstances to consider that document again.

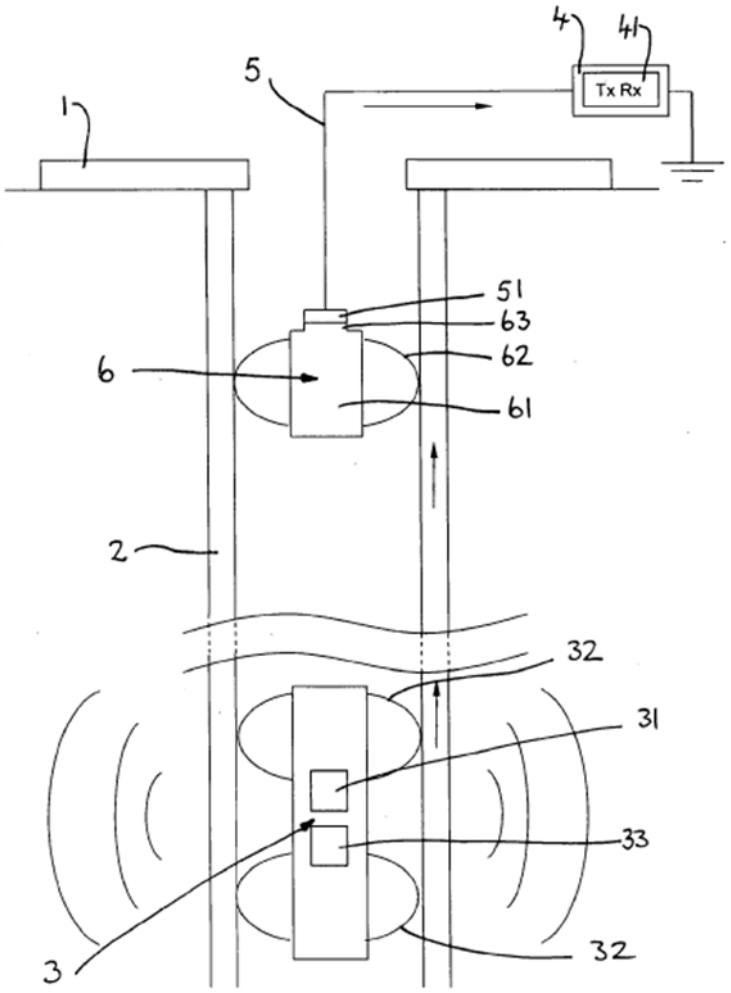
8. I also note that document E4 above was cited on the original Search Report under Section 17(5) dated 6 November 2012. At that time, document E4 was considered to indicate technological background only of the claimed invention. However, I do note that the claims of the granted patent have been amended since the original search was performed and so I will reconsider this document but having in mind the extent to which it has already been considered.

9. Opposition proceedings have also been conducted at the EPO in respect of related EP patent 2898183, which claims priority from the GB patent. These EPO proceedings clearly constitute relevant proceedings as outlined in Rule 94(1)(b). I note that the questions raised in this request have also been considered by the Opposition Division of the EPO in relation to EP 2898183. However, I also note that the scope of the independent claims of EP 2898183 is different to the scope of the claims of this GB patent. Therefore, I will reconsider the questions raised in this request in relation to the GB patent but will have in mind the extent to which the questions have already been considered by the EPO.

The patent

10. The patent is entitled “Downhole communication” and was filed on 19 September 2012 with no earlier declaration of priority. The patent was granted on 26 February 2020 and remains in force in the UK.

11. The patent relates to well installation communication systems for communication between a downhole unit 3 and a surface unit 4 where at least a part of the signal path between the downhole unit 3 and surface unit 4 travels along the downhole metallic structure 2. Whilst such systems can function effectively, there can be limits on range and achievable data rates due to the non-ideal nature of the metallic structure 2 as a signal channel. The arrangement presented in the patent provides a cable 5 and connection device 6 that can be introduced into the well and connected to the metallic structure 2 when it is desired to communicate signals rather than requiring signals to travel all the way between the communication units 3, 4 along the metallic structure 2. This is illustrated in figure 1 of the patent, reproduced below.



12. The patent includes four independent claims – claims 1, 17, 18 and 19. The questions raised in the request in relation to novelty and inventive step are primarily directed to the features of independent claim 1 with acknowledgement that the other independent claims define largely equivalent features (although the requester suggests that claim 18 is not limited by features F, I or J, and claim 19 is not limited by features B, C, I or J below). Independent claim 1 is reproduced below with features labelled as in the request:

A) A well installation communication system comprising:

B) a downhole metallic structure;

C) a downhole communication unit deployed at at least one of:

D) a location within the downhole metallic structure, or an open hole location beyond where the downhole metallic structure extends; wherein

E) the downhole communication unit is configured to communicate electrical signals from the location within the downhole metallic structure, or from the open hole location, into and along the downhole metallic structure for transmission to a surface communication unit

F) [the surface communication unit] arranged for electrical signal communication with the downhole communication unit,

G) the well installation communication system further comprising a cable and

H) a connection device

I) being removeably deployable in the downhole metallic structure,

J) the connection device being electrically disconnectably and reconnectably connectable to the downhole metallic structure, and

K) having a connector portion to which an end of the cable is mechanically and electrically connected, wherein

L) the downhole communication unit is arranged entirely downhole of the connection device and

M) the downhole communication unit is arranged as an electric dipole tool for applying an electrical signal to the downhole metallic structure

N) which will propagate away from the downhole communication unit towards surface, and wherein

O) the cable and connection device are configured such that, when deployed and electrically connected in the downhole metallic structure, a signal channel is formed comprising: a portion of the downhole metallic structure; and a portion of the cable running within the downhole metallic structure away from said portion of the downhole metallic structure towards the surface, that signal channel providing better signal characteristics at the surface communication unit than when signals would otherwise travel all the way between the downhole communication unit and the surface communication unit along the downhole metallic structure.

Added matter

13. Section 76(2) of the Patents Act read:

No amendment of an application for a patent shall be allowed under section 15A(6), 18(3) or 19(1) if it results in the application disclosing matter extending beyond that disclosed in the application as filed.

14. The request raises questions regarding added matter in claims 18 and 19. The relevant parts of these claims are reproduced below with the potentially offending amendments marked up:

> *18. …*
>
> *electrically connecting another end of the portion of the cable to the surface communication unit~~; and~~*
>
> *to permit signalling between the downhole communication unit and surface communication unit via the resulting signal channel…*
>
> *19. Apparatus for use in a well installation communication system, comprising:*
>
> *a portion of cable;*
>
> *~~a downhole communication unit and~~ a surface communication unit arranged for electrical signal communication with ~~the~~a downhole communication unit…*

15. Each of these amendments results in omission of a feature specified in the original claim – namely, an explicit "*signalling*" step in claim 18 and an explicit definition of "*a downhole communication unit*" in claim 19 – so the requester has referred to the "*Houdaille Test*" set out by the EPO Board of Appeal in *Houdaille/Removal of feature*[1] and summarised by Kitchin L J in *Nokia Corporation v IPCOM GMBH & Co*[2]:

> "The skilled person must be able to recognise directly and unambiguously that (1) the [omitted] feature is not explained as essential in the original disclosure, (2) it is not, as such, indispensable for the function of the invention in light of the technical problem it serves to solve, and (3) the replacement or removal requires no real modification of other features to compensate for the change."

16. The requester argues that each amendment fails all three parts of this test and, thus, each amendment adds matter.

17. In relation to claim 18, the proprietor argues that the introduction of the cable (i.e. electrical connection of the cable) provides a signal path and therefore signalling. Accordingly, it is contended that the "*signalling*" step is not explained as being essential, is not indispensable and does not require modification to compensate.

18. I note that the amendment to claim 18 that is said to have extended the original disclosure is the same as an amendment made to claim 15 of the granted EP patent, which the Opposition Division of the EPO considered to contravene Article 123(2) EPC (i.e. added subject matter) – see paragraphs 6.13 to 6.14.3 of the Preliminary Opinion of the Opposition Division dated 15 April 2020 and paragraphs 26 to 26.5 of the Grounds for the decision dated 23 June 2021 following oral proceedings. In particular, the Opposition Division noted that providing a signal path does not automatically mean that signalling takes place. Signalling requires not only a signal path being provided but also a signal travelling over this signal path. And so, deletion of the (active) signalling step confronts the skilled person with new technical information not originally disclosed.

1 *T331/87 Houdaille/Removal of feature [1991] E.P.O.R. 194*
2 *Nokia Corporation v IPCOM GMBH & Co KG (No. 3) [2013] R.P.C. 5*

19. I do not believe that the observations of the proprietor have presented any further argumentation to suggest that the opinion of the EPO Opposition Division does not apply equally to the amendment of claim 18 of the patent and so I am minded to agree with that opinion. Claim 18 is to a "*method of electrical signal communication*" and so I consider the step of actual "*signalling*" to be essential to the claimed method and indispensable for the function of the invention. Furthermore, removal of the step of "*signalling*" would require the modification of the step of "*electrically connecting*" the cable to now include providing an actual signal on the signal path. Therefore, I consider that this amendment to claim 18 has extended the protection conferred by the patent and thus should not have been allowed.

20. In relation to claim 19, the proprietor argues that the patent (and application as filed) presents the "*apparatus*" without the "*downhole communication unit*" and, thus, the downhole communication unit is optional, is not indispensable and does not require modification to compensate. However, I note that the sections of the description to which the proprietor refers in support of their argument are parts of the granted patent publication (at page 6 line 30 to page 7 line 17) that were amended after filing. Therefore, they cannot be used to indicate the essentiality or otherwise of the feature in the originally filed disclosure.

21. Once again, I note that the amendment to claim 19 that is said to have extended the original disclosure is the same as an amendment made to claim 16 of the granted EP patent, which the Opposition Division of the EPO considered to contravene Article 123(2) EPC (i.e. added subject matter) – see paragraphs 24 to 24.4 of the Grounds for the decision of the Opposition Division dated 23 June 2021 following the oral proceedings. The Opposition Division noted that throughout the description the downhole communication unit, the cable and the connection unit are presented as a combined arrangement.

22. The observations of the proprietor have not convinced me that the opinion of the Opposition Division of the EPO does not apply equally to the amendment of claim 19 of the patent. Therefore, I consider that this amendment to claim 19 has extended the protection conferred by the patent and thus should not have been allowed.

Claim construction

23. Before I can determine an opinion as to the validity of the patent in respect of novelty and inventive step, I must first construe the claims. This means interpreting the claims in light of the description and drawings as instructed by section 125(1) of the Patents Act:

> *For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.*

24. I must interpret the claims in context through the eyes of the person skilled in the art. Ultimately, the question is what the person skilled in the art would have understood the patentee to be using the language of the claims to mean. This approach has been confirmed in the recent decisions of the High Court in *Mylan v Yeda*[3] and the Court of Appeal in *Actavis v ICOS*[4].

25. Both requester and patent proprietor refer to the skilled person in their submissions, but neither attempts to define who the skilled person is. Nevertheless, the introductory paragraphs of the patent specification provide a good overview of the relevant skilled person – an engineer or designer of downhole communication systems with working knowledge of the different signalling techniques use in oil and/or gas wells to communicate between devices provided downhole and the surface. Their common general knowledge would include the different communication techniques used for transmitting these signals, such as wired systems where electrical signals are transmitted without the use of dedicated cables and wireless systems in which electrical signals are applied to the downhole metallic structure and travel along this metallic structure as the signal path.

26. Feature E of claim 1 requires that "*the downhole communication unit is configured to communicate electrical signals… into and along the downhole metallic structure for transmission to a surface communication unit*". The requester and patent proprietor disagree as to whether this feature includes inductive (electromagnetic) transfer of signals into the downhole metallic structure or not. It is noted that feature E (together with feature D) of claim 1 also specifies that the "*downhole communication unit*" may be deployed at "*an open hole location beyond where the downhole metallic structure extends*" and, in such an arrangement, "*the downhole communication unit is configured to communicate electrical signals… from the open hole location, into and along the downhole metallic structure*". It would therefore be apparent to the skilled person that '*communicating electrical signals… into and along the downhole metallic structure*' would necessarily include an inductive / electromagnetic transfer of signals into the "*metallic structure*". Thus, the expression, "*communicate electrical signals… into and along the downhole metallic structure*" in the patent claims is construed to include the inductive (electromagnetic) transfer of signals into the "*downhole metallic structure*".

27. Features I and J of claim 1 require the "*connection device being removeably deployable in the downhole metallic structure, the connection device being electrically disconnectably and reconnectably connectable to the downhole metallic structure*". The requester argues that any gauge/device that is deployable must also be inherently removable, even if such a gauge/device is described as "permanent". The patent proprietor counters that a novelty destroying disclosure would require an explicit indication that the gauge/device is removeable. I believe that a skilled person would construe these features purposively in light of the description and so would recognise that the patentee meant for the "*connection device*" to be of a type/construction that is readily removeable/disconnectable/reconnectable.

Validity – novelty and inventive step

28. Section 1(1) of the Patents Act reads:

3 *Generics UK Ltd (t/a Mylan) v Yeda Research and Dev. Co. Ltd & Anor [2017] EWHC 2629 (Pat)*
4 *Actavis Group & Ors v ICOS & Eli Lilly & Co. [2017] EWCA Civ 1671*

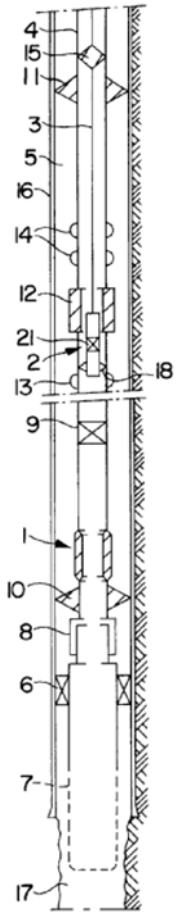
A patent may be granted only for an invention in respect of the following conditions are satisfied, that is to say –

(a) the invention is new;

(b) it involves an inventive step…

29. The requester has argued that each of the independent claims is not novel over each of documents E1 to E4 (I note that document E5 is discussed only to establish what may be implicit in the disclosure of E4). However, as already indicated above, the question of validity of the patent based on document E1 was considered during the examination of the application.

30. E2 discloses a device and method for transmitting information between a well bottom and the surface by means of electromagnetic waves. A first communication unit 1 and a second (shuttle) communication unit 2 are situated within a casing 16 (i.e. "*downhole metallic structure*") and communicate with each other by means of electromagnetic currents guided by the casing 1 and/or a test string. The shuttle communication unit 2 is lowered by means of a cable 3 into the inner space of the well 5, and a contact means 18 ensures electric contact and mechanical anchoring of the shuttle 2 in the test string. The transmitter/receiver in each communication unit 1, 2 can inject carrier frequency signals along the test string by means of a dipole. Figure 1 is reproduced below.



31. The patent proprietor argues that document E2 fails to disclose features E, I and M

of claim 1.

32. Feature I requires the connection device (i.e. the shuttle communication unit 2) to be removably deployable in the downhole metallic structure. Contrary to the patent proprietor's arguments, I am of the opinion that the shuttle of E2 is disclosed as being removably deployable. As indicated by the requester, the very term 'shuttle' suggests movement back and forth within the structure. Furthermore, as disclosed in column 5 lines 12 to 32, the shuttle 2 is "lowered into the inner space of the pipes… by means of a cable 3… shuttle comprises electric contact means 18, preferably in the form of remote-controlled fingers or wipers… this configuration imposes no precise position of the shuttle with respect to the test string". All of this suggests to me that the shuttle communication unit is removably deployable.

33. Feature M requires the downhole communication unit (i.e. the first communication unit) to be arranged as an electric dipole tool. Again, I consider that this is disclosed in E2, for example, at column 4 lines 40 to 45: "The transmitter/receiver of each unit 1 and 2 of the present device intended to inject or to receive the carrier frequency propagated along the test string can be made by means of a well-known technique, i.e.… an extended dipole". Therefore, it seems to me that feature M is present in the disclosure of document E2.

34. Regarding feature E, the requester and patent proprietor disagree as to whether the inductive (electromagnetic) transfer of signals into the casing and/or test string constitutes communication of electrical signals into and along the downhole metallic structure. However, as discussed in the Claim Construction section above, I believe that a skilled person would understand that communication of electrical signals into and along the downhole metallic structure would include inductive (electromagnetic) transfer of such signals. As already noted above, the actual means for the communication of electrical signals into the metallic structure defined in claim 1 of the patent (i.e. "*an electric dipole tool for applying an electrical signal to the downhole metallic structure*" – see feature M) is the same as that disclosed in document E2. Therefore, I also believe that feature E is present in the disclosure of document E2.

35. Therefore, I am of the opinion that claims 1, 17 to 20 and 22 of the patent are not new (N.B. claims 20 and 22 add features C and D to claim 19).

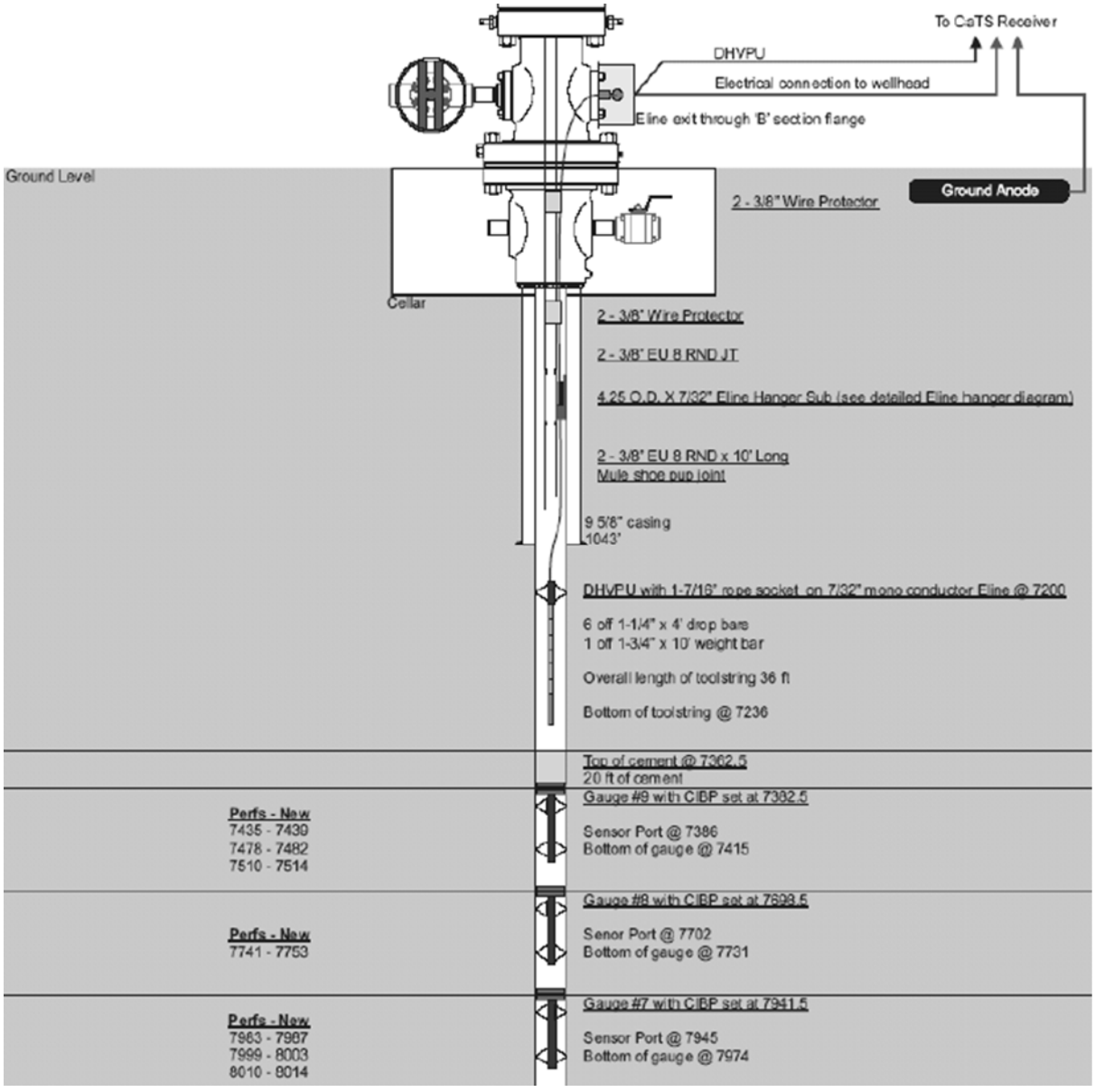
36. I am also of the opinion that the contact means 18 of the shuttle 2 provides mechanical contact with the casing and that the cable 3 would implicitly require a "*connector portion*" for both electrical and mechanical connection to the shuttle 2 such that dependent claims 2 to 4 are not new. Furthermore, the cable 3 is described as a coaxial cable in E2 (see, for example, column 4 line 60). Therefore, I believe that dependent claim 5 is not new.

37. Dependent claim 7 defines that the cable comprises an e-line. In the patent specification, e-lines are described as being "*known in the oil and gas industry and are arranged both for use in deployment of components downhole and also to provide power and/or signals to the components which are deployed. The e-line 5 in conventional systems and in the present system is provided on a reel (not shown) at the surface in usual circumstances to allow the cable 5 to be fed out as a component (in this case the connection device 6) is deployed into the well*" (see page 8 lines 23

to 29). Therefore, it seems to me that it would be obvious to the skilled person that the cable 3 in E2 could be replaced by a conventional e-line such that claim 7 lacks an inventive step.

38. Additionally, contact means 18 of the shuttle 2 makes contact with the inside of pipe 4. Therefore, I believe that claims 8 and 9 are not new.

39. E3 discloses a cable-less communication system for transmitting pressure data to the surface from within an abandoned well. The system uses the Cableless Telemetry System (CaTS) marketed by the patent proprieter. Signals from CaTS gauges positioned within the well are modulated on a current loop through the tool and the casing, travelling up the casing towards the surface for detection and decoding. A downhole voltage pick-up unit (DHVPU) is suspended into the well by a cable. Figure 1 is reproduced below.

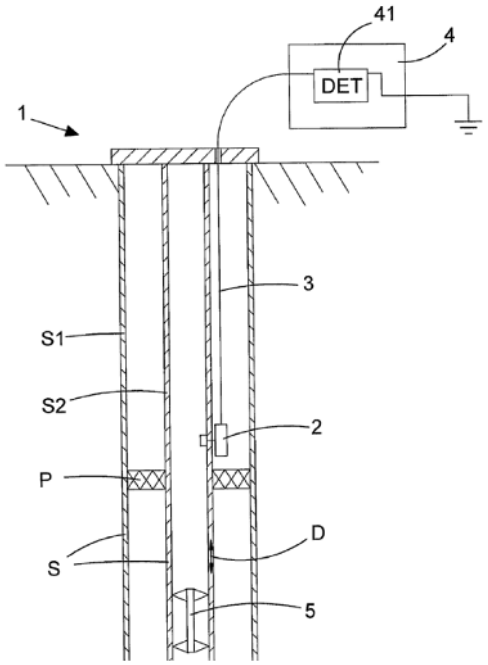


40. The patent proprietor argues that document E3 fails to disclose features I and J of claim 1. Features I and J require the connection device (i.e. the DHVPU in E3) to be

removably deployable and electrically disconnectable and reconnectable within the downhole metallic structure. Based on the description of the system in E3, I agree with the patent proprietor's arguments. Document E3 is clear in describing the selected system as a 'more permanent option… one could simply leave the systems down hole as part of the permanent abandonment' as opposed to a system in which the pressure gauges are retrieved, which is likely to "use the expensive option of a rig" (see page 2 column 1). I recognise that a skilled person would understand that these contrasting options (retrievable versus permanent) relate largely to the downhole pressure gauges (i.e. the "*downhole communication unit*") rather than the DHVPU (i.e. the "*connection device*") but, without any explicit indication to the contrary, I do not believe that a skilled person is motivated to consider that the DHVPU needs to be removably deployable and electrically disconnectable and reconnectable in an overall system that is presented as "permanent" and can be 'simply left… as part of the permanent abandonment'. Therefore, I am of the opinion that claim 1 of the patent is novel and inventive over document E3.

41. However, as noted by the requester, independent claims 18 and 19 are not limited by features I and J. The patent proprietor has not proposed any further features of these claims that would distinguish them from document E3 (I also note that the Preliminary Opinion of the EPO considered claim 1 of the granted EP patent to be novel and inventive over document E3 because it lacks features I and J, but the Preliminary Opinion made no reference to any of the other features present in the independent claims). I have not been able to identify any features of claims 18 and 19, or dependent claims 20 to 22, that distinguish these claims from document E3. Therefore, I am of the opinion that claims 18 to 22 of the patent are not new.

42. E4 discloses a signalling system for communicating with a downhole location in a well installation. A cable 3 passes someway down into the well and is connected to a downhole gauge 2 (i.e. "*connection device*"). Electrical connection is achieved between the cable 3 and the metallic structure S of the well to allow signals to be transferred between a downhole communications tool 5 (i.e. "*downhole communication unit*") and the surface via the cable 3. Figure 1 is reproduced below.



43. Document E4 was cited by the UK search examiner at the time of the original search during pre-grant prosecution of the patent application. At that time, the search examiner considered that document E4 represented technological background of the invention, rather than disclosing matter that would render the original claims not novel or inventive. In particular, the search examiner considered that the downhole gauge 2 (i.e. "*connection device*") is disclosed to be permanently deployed downhole and so does not anticipate original claim 1 (i.e. as argued by the requester, document E4 lacks features I and J). Furthermore, the search examiner also noted that the cable 3 and downhole gauge 2 are not actually located "***in*** *the downhole metallic structure*", a "*portion*" of which forms part of the "*signal channel*" – in document E4, the "*metallic structure*" that forms part of path of data signals is production tubing S2 (i.e. as argued by the requester, document E4 also lacks feature O). I note that the Opposition Division of the EPO highlighted the same feature as distinguishing claim 1 (and independent claims 17 to 19) of the patent from E4.

44. I have not been convinced by the arguments of the requester to conclude any differently from the UK search examiner or Opposition Division of the EPO in relation to document E4. It seems clear to me that, throughout the specification of E4, the downhole gauge 2 is described as "permanent", not "*removeably deployable*… *electrically disconnectably and reconnectably connectable*". The requester draws attention to document E5 in an attempt to demonstrate that, although referred to as "permanent", such downhole gauges are inherently removable. However, I do not follow the requester's reasoning. Even if document E5 presents such an understanding, nothing in document E4 would motivate the skilled person to look for any other solution than to permanently locate the downhole gauge 2 in the disclosed arrangement. In fact, in paragraph 0069 of E4, a situation is discussed in which the cable 3 "does not make a proper connection with the permanent downhole gauge 2 and this permanent downhole gauge 2 in effect is redundant" – there is no suggestion of removing the downhole gauge 2. Similarly, paragraph 0077 presents a scenario where "the downhole gauge unit 2 may not function correctly or indeed at all", but "it is possible still to provide an electrical connection path between the cable 3 and the downhole structure S through the downhole gauge unit 2" – again, there is no suggestion of removing the non-functioning downhole gauge 2. The solution presented in paragraph 0080 is "the application of a destructive signal… which serves to destroy the Zener diode" within the downhole gauge unit 2 and "result in a short circuit being created". Hence, I am of the opinion that claim 1 of the patent is novel and inventive over E4.

45. The requester has argued that the cable 3 and downhole gauge 2 in E4 are within casing S1, which itself is described as part of an overall metallic structure S comprising both S1 and production tubing S2. However, I am still of the opinion that claims 17 to 19 (as well as claim 1) require the cable 3 and downhole gauge 2 to be within the metallic structure that provides part of the signal path between the downhole communications tool 5 and the surface – in E4, that is clearly the production tubing S2. Therefore, I am of the opinion that claims 17 to 19 of the patent are novel and inventive over E4.

Opinion

46. In my opinion, both claim 18 and claim 19 are invalid as the protection conferred by them has been extended by amendment which should not have been allowed.

47. Furthermore, I am of the opinion that claims 1 to 5, 8, 9, 17 to 20 and 22 are invalid as the invention defined by them is not new in the light of the disclosure of document E2 and claim 7 is invalid as the invention defined by it lacks inventive step in the light of the disclosure of document E2. Additionally, in my opinion, claims 18 to 22 are invalid as the invention defined by them is not new in the light of the disclosure of document E3. However, I am of the opinion that claims 1 to 22 are new and inventive over document E4.

Application for review

48. Under section 74B and rule 98, the proprietor may, within three months of the date of issue of this opinion, apply to the comptroller for a review of the opinion.

Dan Hickery
Examiner

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.