Intellectual Property Office

BL O/0369/26

29 April 2026

PATENTS ACT 1977

APPLICANT	Openfield
ISSUE	Whether GB2306083.3 complies with Sections 14(3) and 14(5)(b)&(c) of the Patents Act 1977
HEARING OFFICER	George Talbot

DECISION

Background

1 Application GB2306083.3 was filed on 25th April 2023 in the name of Openfield and declares an earliest date of 30th April 2022. The application was published as GB 2619603 A on 13th December 2023.

2 The examiner issued a combined search and examination report on 10th October 2023 objecting to a lack of clarity, support and sufficiency in the claims, as well as a lack of inventive step. The applicant responded on 21st February 2024, amending the claims and refuting the objections raised by the examiner. Despite further rounds of examinations and responses by the applicant, the examiner and applicant have been unable to resolve the issue of whether the claims are clear, supported and sufficient. In their letter dated 6th June 2024, the examiner offered a hearing on this matter and stated that if further arguments or amendments were received then the application may be passed to a Hearing Officer to consider.

3 Following further arguments and amendments, the examiner issued a letter on 21st November 2025 outlining their outstanding clarity, support and sufficiency objections, and that the application would be passed to a Hearing Officer to consider the issues afresh. The examiner also noted in this letter that there were no other outstanding issues – in particular, the issue of inventive step had been overcome.

4 These outstanding issues came before me at a hearing on 11th February 2026. The applicant's representative, Mr Humphrey-Evans, filed skeleton arguments on 4th February 2026 for which I am grateful, and corrected these skeleton arguments shortly before the hearing. I confirm that I have considered these corrected skeleton arguments.

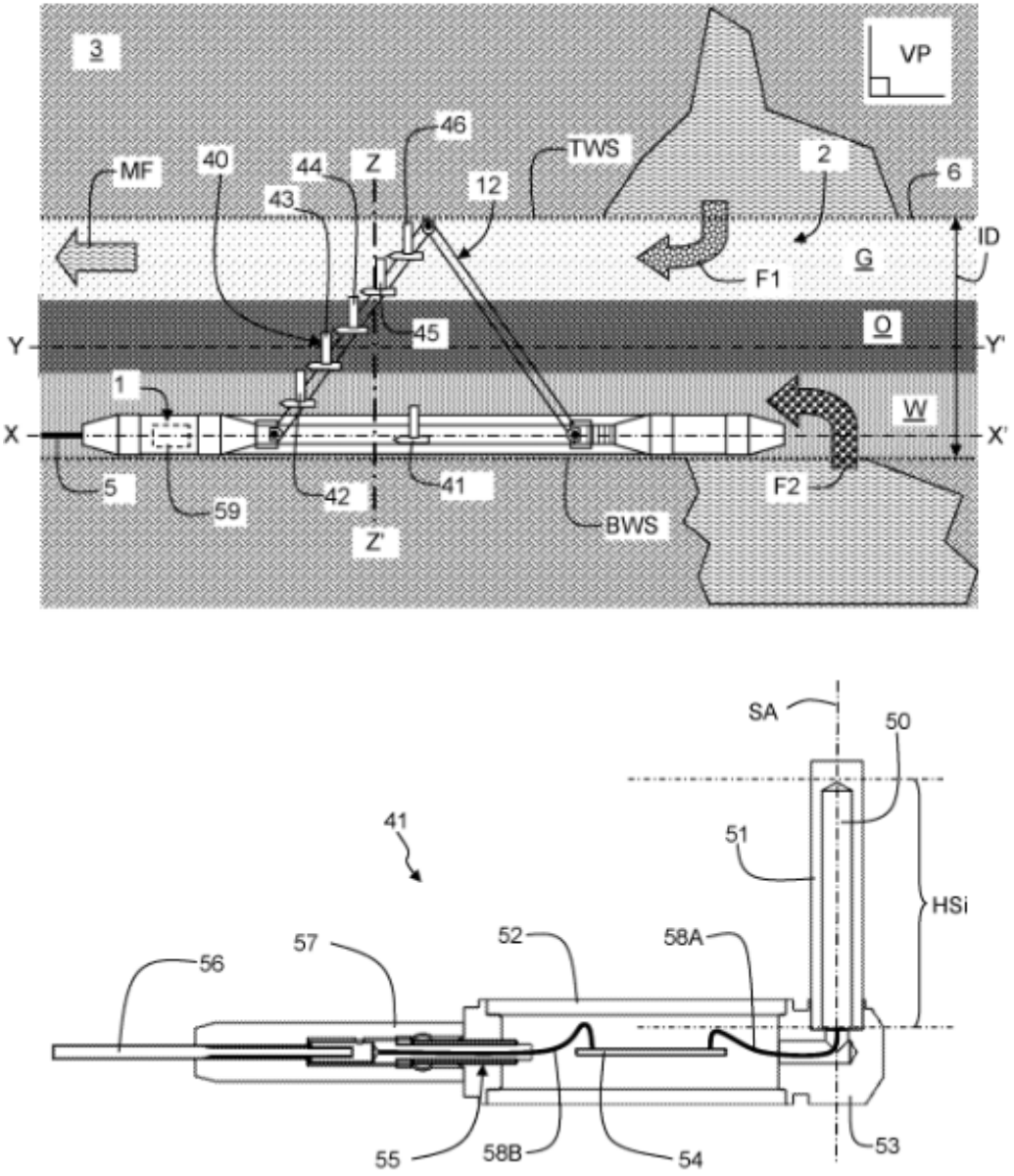
The Invention

5 During production in a hydrocarbon well, it is necessary to monitor various parameters, such as the relative volumetric flow rates of the different phases (e.g. oil O, gas G and water W) of the multiphase fluid mixture flowing into the pipe of the well from the hydrocarbon bearing zones. Production logging tools typically operate in a harsh downhole environment at downhole pressure (typically in the range of 100 to 2000 bar) and temperature (typically in the range of 50 to 200°C) conditions, and in potentially corrosive fluids. Furthermore, hydrocarbon wells often comprise a vertical well section, deviated well sections, highly deviated well sections and horizontal well sections. Accurate monitoring requires the use of sensors or probes capable of imaging a surface section or a volume section of the pipe and providing an estimation of the surface section or the volume section occupied by each phase. Measuring multiphase flow in highly deviated and horizontal well sections requires a resolution of layered flow within the well sections.

6 The invention relates to a production logging tool 1 for such hydrocarbon wells 2. The tool 1 has a water level measurement probe 40 to be deployed in highly deviated well sections or horizontal wells and is used to analyse a multiphase fluid mixture (oil O, gas G and water W) flowing from a hydrocarbon bearing zone into a hydrocarbon well.

7 In particular, the body 10 of the tool 1 carries retractable/extendable articulated twin arms 12 via a sliding sleeve. At least one of the arms carries the probe 40. The probe 40 comprises multiple water level capacitance sensors 42, 43, 44, 45, 46. When the arms 12 are in their extended position, the water level capacitance sensors are positioned at different heights from a bottom well section BWS to a top well section TWS of the highly deviated or horizontal section of the well 2.

8 Each water level capacitance sensor has an electrode 50 extending along a height segment HSi, and is covered by a protective cap 51, which allows the probe 40 to substantially cover the internal diameter ID of the well section. Furthermore, it is said that the axis SA of the electrode 50 and insulator 51 is substantially perpendicular to the longitudinal axis XX' or well axis YY' for any opening or extension of the deployment arms. This may be achieved using a pantographic mechanism. Figures 1 (a partial cross-section of a horizontal well section comprising the production logging tool 1 in its fully deployed configuration) and 6 (a side cross-sectional view of a water level capacitance sensor) from the application are reproduced below.



9 There are two independent claims defining a production logging tool (claim 1) and a corresponding measurement method (claim 10). Claim 1 and claim 10 as filed on 21st August 2025 are as follows:

> *1. A highly deviated or horizontal well production logging tool (1) comprising an elongated cylindrical body (10) of longitudinal axis (XX'), the body (10) carrying an articulated twin arm deployment arrangement (12) comprising two deployment arms (13A, 13B) coupled together, to the body (10) and to a sliding sleeve (19), the deployment arms (13A, 13B) being operable from a retracted configuration into a vertically extended configuration, wherein:*
>
> > *at least one arm carries a segmented water level capacitance probe (40) comprising multiple water level capacitance sensors (41, 42, 43, 44, 45, 46) sensitive to a water content of a multiphase fluid mixture (MF) flowing in a hydrocarbon well (2);*

the water level capacitance sensors are positioned along the arm so as to be operationally positioned at different height from a bottom (BWS) to a top (TWS) of a highly deviated or horizontal section of the hydrocarbon well (2) when the deployment arms are vertically extended;

each water level capacitance sensor (41, 42, 43, 44, 45, 46) comprising a conductive body forming an electrode (50) covered by a protective cap forming an insulator (51) extending substantially vertically along a height segment (HSi) such that the segmented water level capacitance probe (40) substantially covers an internal diameter (ID) of said section of the hydrocarbon well (2), so that a capacitance sensing part axis (SA) of the electrode (50) and the insulator (51) can be operationally positioned substantially perpendicularly to said longitudinal axis (XX') for any opening of the deployment arms (13A, 13B) from the retracted configuration to the vertically extended configuration in said section of the hydrocarbon well (2).

10. A water level measuring method in a highly deviated or horizontal section of a hydrocarbon well comprising the steps of:

providing a production logging tool (1) in the hydrocarbon well (2), the production logging tool (1) comprising an elongated cylindrical body (10) of longitudinal axis (XX'), the body (10) carrying an articulated twin arm deployment arrangement (12) comprising two deployment arms (13A, 13B) coupled together, to the body (10) and to a sliding sleeve (19), the deployment arms (13A, 13B) being operable from a retracted configuration into a vertically extended configuration, wherein:

at least one arm carries a segmented water level capacitance probe (40) comprising multiple water level capacitance sensors (41, 42, 43, 44, 45, 46) sensitive to a water content of a multiphase fluid mixture (MF) flowing in the hydrocarbon well (2);

the water level capacitance sensors are positioned along the arm such as to be operationally positioned at different heights from a bottom (BWS) to a top (TWS) of the highly deviated or horizontal section of the hydrocarbon well (2);

each water level capacitance sensor (41, 42, 43, 44, 45, 46) comprising a conductive body forming an electrode (50) covered by a protective cap forming an insulator (51) extending substantially vertically along a height segment (HSi);

running the production logging tool (1) along the hydrocarbon well (2) while operating the deployment arms (13A, 13B) to vertically extend into engagement with a wall of the hydrocarbon well (2), said articulated twin arm deployment arrangement (12) being configured such that a capacitance sensing part axis (SA) of the electrode (50)

and the insulator (51) is substantially perpendicular to the well axis (YY') for any vertical extension of the deployment arms when running the production logging tool (1) along the hydrocarbon well (2) so that the segmented water level capacitance probe (40) substantially covers an internal diameter (ID) of said section of the hydrocarbon well (2);

determining the water level (WL) in said section of the hydrocarbon well (2) based on signals proportional to the capacitance measured by each water level capacitance sensor (41, 42, 43, 44, 45, 46) and related to a local water level along said height segment (HSi) all along the arm carrying the segmented water level capacitance probe (40).

The Law

10 Section 14 of the Patents Act 1977 ("the Act") sets out various requirements for the making of an application. The relevant provisions are sections 14(3) and 14(5) which read:

14(3) The specification of an application shall disclose the invention in a manner which is clear enough and complete enough for the invention to be performed by a person skilled in the art.

14(5) The claim or claims shall –
(a) …
(b) be clear and concise;
(c) be supported by the description;
…

11 Section 125 of the Act sets out the extent of the invention as follows:

125(1) For the purposes of this Act an invention for a patent 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.

The issues to be decided

12 In their letter dated 21st November 2025 the examiner sets out that claims 1 and 10 fail to meet the requirements for clarity, sufficiency and support. Specifically, they identify the following features of claims 1 and 10 as lacking clarity, sufficiency and support:

"so that a capacitance sensing part axis (SA) of the electrode (50) and the insulator (51) can be operationally positioned substantially perpendicularly to said longitudinal axis (XX') for any opening of the deployment arms (13A, 13B)

from the retracted configuration to the vertically extended configuration in said section of the hydrocarbon well (2)" (claim 1)

"said articulated twin arm deployment arrangement (12) being configured such that a capacitance sensing part axis (SA) of the electrode (50) and the insulator (51) is substantially perpendicular to the well axis (YY') for any vertical extension of the deployment arms when running the production logging tool (1) along the hydrocarbon well (2)" (claim 10)

13 The examiner considers that these features in claims 1 and 10 are unclear as they are defined in terms of a result to be achieved, as opposed to the specific technical features required to achieve the stated result. The examiner has referred to *No-Fume*[1] and discussed that the area defined by the claims must be as precise as the invention allows and, as a general rule, claims which attempt to define the invention, or a feature thereof, by a result to be achieved should not be allowed. Such a definition is only allowed if the invention can only be defined in such terms or cannot be defined more precisely without unduly restricting the scope of the claims. Furthermore, an allowable definition by result is one which can be directly and positively verified by tests or procedures adequately specified in the description and involves nothing more than trial and error.

14 The examiner considers that, as the only disclosed means of achieving the result is a pantographic mechanism and with no alternate appearing to be contemplated in the specification, the claims should therefore be restricted to such a pantographic mechanism. According to the examiner, limiting the claims to a pantographic mechanism would not unduly restrict the scope of the claim, as to arrive at alternate means of achieving the result would prima facie require a level of inventive ingenuity. As claims 1 and 10 do not define the enabled technical features required to achieve this result (i.e. the pantographic mechanism), the monopoly defined is considered to extend beyond what is supported by the specification, such that it is insufficient for excessive claim breadth. The examiner has discussed *Biogen*[2] and *Novartis*[3] and concluded that the person skilled in the art would not be able to perform the invention across the scope of the claim without undue burden.

15 By failing to limit the presently defined monopoly to what has been enabled, the examiner considers these features in claims 1 and 10 to be broad and speculative such that their scope extends beyond the description to embrace possibilities the description does not enable to be put into practice. The examiner argues that, while claims can be defined in terms of a functional feature – if the skilled person would appreciate there are other means of achieving the same function – the specification provides no indication that this is the case.

16 With regard to support, the examiner considers that the breadth of the claims must be properly supported by the description of the invention in the specification and a claim can only be supported by an enabling disclosure. The examiner notes, as discussed in 14.156 of the Manual of Patent Practice (MoPP), that a claim may broadly define a feature in terms of its function, even where only one example of the

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[1] *No-Fume Ltd v Frank Pitchford Co Ltd, 52 RPC 231*
[2] *Biogen Inc v Medeva plc [1997] RPC 1*
[3] *Novartis AG v Johnson & Johnson [2010] EWCA Civ 1039*

feature has been given in the description, if the skilled reader would appreciate that other means could be used for the same function. However, the examiner is of the opinion that a skilled addressee would not appreciate that other means could be used for the same function.

17 In their letter dated 21st November 2025 the examiner has indicated that, in their opinion, claims 1 and 10 should be amended so as to be limited to the sole disclosed means for implementing the result – the pantographic mechanism. If the claims are considered allowable in their present form, the examiner considers that the application can be referred to grant without amendment. If the claims are not considered allowable in their present form, the examiner notes that the application can be referred for grant when these relevant amendments have been made.

Claim Construction

18 The starting point for assessing the application lies in construing the claims. This means interpreting the claims in light of the description and drawings as instructed by section 125(1) of the Act. In doing so 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 decisions of the High Court in *Mylan v Yeda*[4] and the Court of Appeal in *Actavis v ICOS*[5].

19 As confirmed by Mr Humphrey-Evans at the hearing, the person skilled in the art is a petrochemical engineer.

20 The claims relate to a *"highly deviated or horizontal well production tool"*. They also make several references to *"vertical"*, for example the *"vertically extended configuration"* of the deployment arms 13A, 13B. I note that claims 1 and 10 define the orientation of the capacitance sensing part axis SA using different terms – in that claim 1 is relative to *"the longitudinal axis XX'"* of the tool and claim 10 is relative to *"the well axis YY'"*. However, the well axis YY' is construed as the same as the longitudinal axis XX' of the tool <u>when the tool is downhole</u>.

21 It is necessary to look to the description for how to construe *"highly deviated or horizontal"*, and *"vertical"*. The description does not explicitly define what is meant by *"highly deviated"*. The description is clear, however, that *"vertical"* is intended to be in the direction of *"the vertical axis ZZ', i.e. the vertical axis ZZ' is defined by the earth gravity vector"* (page 8 lines 28-29). The main advantage achieved by the claimed invention is clear from the description (emphasis added):

> *"The capacitance sensing part, the electrode 50 and the insulator 51 have a cylindrical shape of axis SA and <u>extend substantially vertically</u> along a height segment HSi […]. The fact that the capacitance sensing part <u>is oriented vertically</u> makes it possible to have a capacitance measurement proportional to*

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

the height of water for each local capacitance sensing part" (page 11 lines 7-16).

22 It is clear therefore that the intention is for the production logging tool to be used where the capacitance sensing part axis SA extends vertically, i.e. substantially parallel with an axis ZZ' defined by the earth gravity vector. For the capacitance sensing part axis SA to be positioned substantially perpendicularly to the longitudinal axis of the tool XX' (claim 1)/the well axis YY' (claim 10), it follows that the longitudinal axis of the tool/the well axis must be substantially horizontal. I have therefore construed "highly deviated or horizontal" as substantially horizontal.

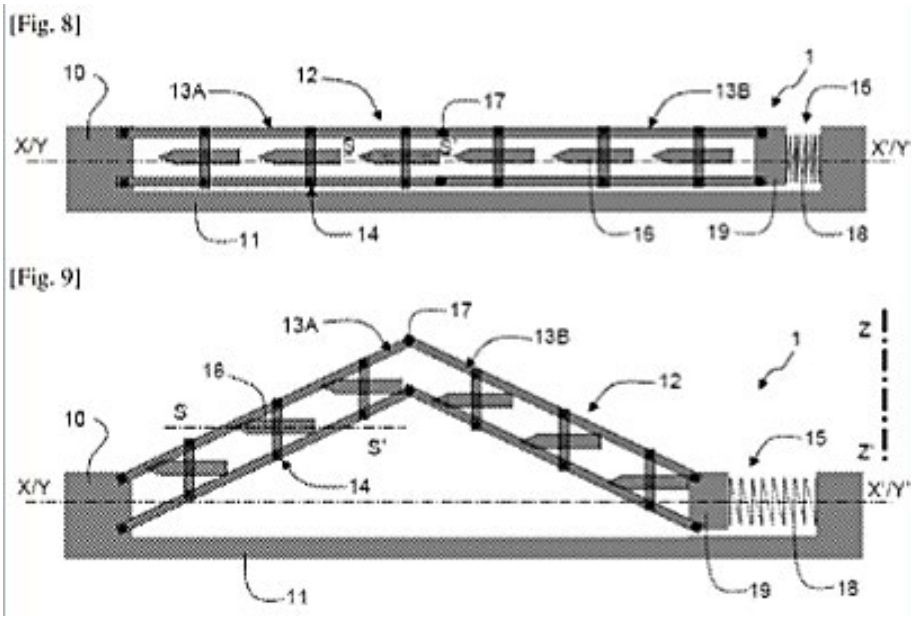
23 There are no issues construing the remainder of claims 1 and 10, except for the issue to be decided as set out above and discussed in detail below.

Documentation

24 Throughout examination and during the hearing, a number of documents, including patent and non-patent literature, have been referred to by the examiner and the applicant. I shall summarise these documents before considering the arguments regarding clarity, support and sufficiency.

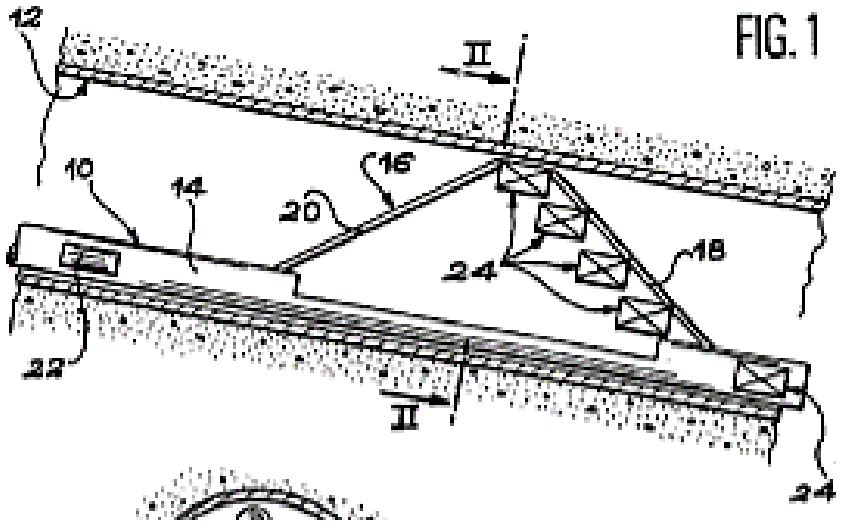
FR 3118988 A1

25 FR 3118988 is mentioned on page 12 of the description of this application (by reference to its application number FR2100465) with respect to the pantographic mechanism. This document is by the same applicant as the current application. This document relates to a production logging tool 1 which has a pantographic mechanism 14 to enable the axis of the sensors SS' to remain parallel to the tool's longitudinal axis XX' for any opening of the deployment arms from the retracted configuration to the vertically extended configuration. Figures 8 and 9 are reproduced below:



US 7114386 B1

26 US 7114386 was cited in the first search report as background art and later cited for inventive step in the examination report dated 6th June 2024 and used by the examiner to demonstrate common general knowledge of the skilled person. It discloses a tool and method for acquiring data of a fluid flowing in a hydrocarbon well 12 in production, in particular in an inclined or horizontal portion of the well. The tool 10 comprises a multi-sensor assembly 24 that is mounted on an arm 18 of a mechanism 16 so that the axes of the spinners are oriented substantially parallel to the longitudinal axis of the well 12 when the mechanism 16 is deployed. Column 5 lines 16-25 of the description states that this can easily be obtained by mounting the assemblies 24 on the arm 18 via deformable parallelogram linkages or the equivalent. Figure 1 is reproduced below:



US 9915144 B2

27 US 9915144 was cited for inventive step in the first examination report dated 10th October 2023 and used by the examiner to demonstrate common general knowledge of the skilled person. It discloses a well logging tool with sensor modules 32. Column 6 lines 18-32 discuss that an advantage of the arrangement is the ability to maintain sensor modules 32_1, 32_2 in an orientation that is substantially the same throughout use of the tool 10 within wellbore 12. Linkage arm 34 maintains sensor module 32_2 in an orientation so that its axis A_{S1} maintains a position substantially parallel with axis A_X of tool 10. As sensor module 32_2 is mounted proximate a mid-portion M of arm 30, its axis A_{S2} also remains in an orientation that is substantially parallel with axis A_X. Alternate embodiments exist wherein the orientations of the modules 32_1, 32_2 are maintained at separate designated angles oblique with respect to axis A_X. Figure 7 is reproduced below:

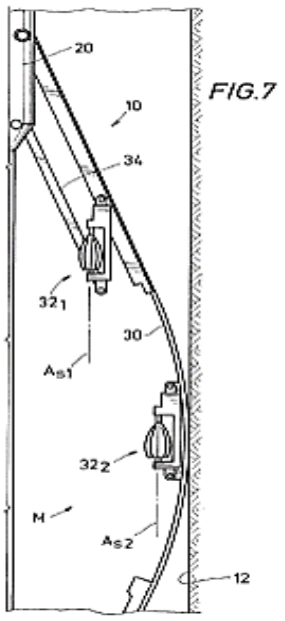


FIG.7

US 5897223 A

28 In their skeleton arguments, the applicant has referred to US 5897223. It discloses a camera stabilizer with three outer axes of rotation having an inner gimbal 1 which consists of a single rigid structure comprising the payload, i.e. the imaging device, and various position and motion sensors and actuators. The inner gimbal 1 fits into a sprung shell 2. The weight of the inner gimbal 1 is precisely and neutrally balanced (about all three orthogonal axes) about the central pivot 11. This document discusses that an array of inclinometers or accelerometers on the payload structure may be used to maintain a vertical reference. An array of servo-positioned weights on the payload structure is used to automatically establish and maintain neutral static balance of the structure about the central pivot. A controller is used for controlling energization of motors to apply controlled moments to the inner gimbal 1 about any axis of rotation. Figure 1a is reproduced below:

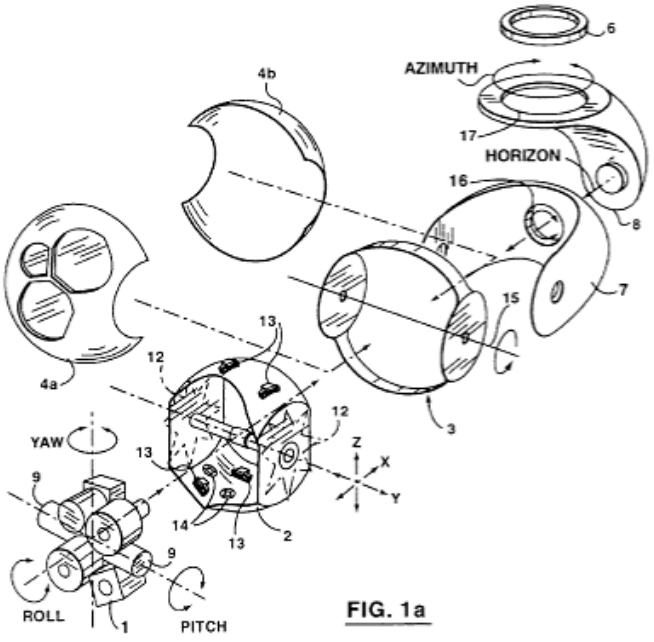
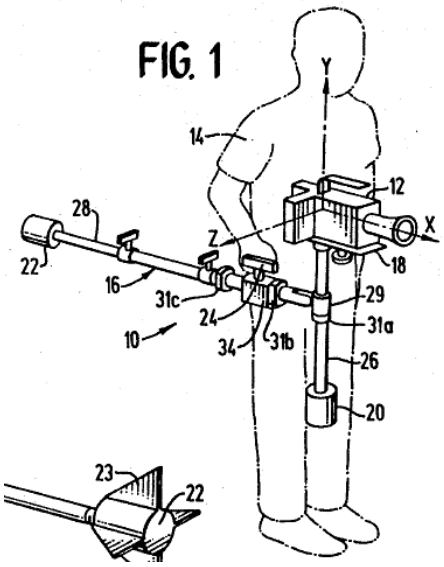
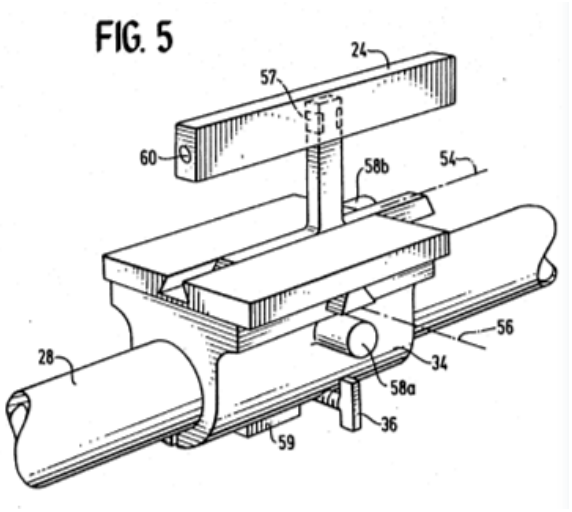


FIG. 1a

US 5243370 A

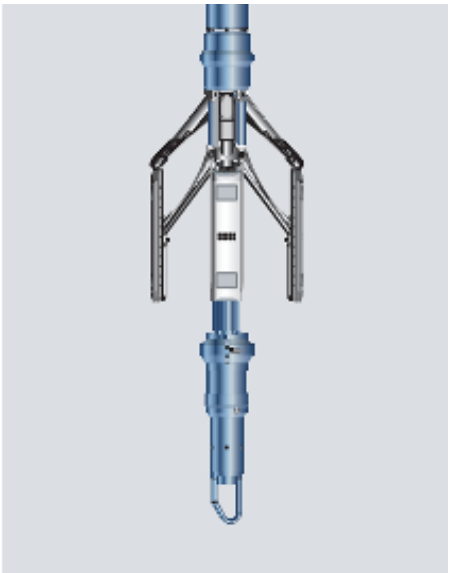
29 In their skeleton arguments, the applicant has referred to US 5243370. It discloses a camera stabilizer which includes an accelerometer or a level sensor 59, such as a mercury switch or pendulum, that can be used to sense changes in orientation of the stabilizer and output a signal indicating a shift in the centre of gravity. Furthermore, the output from the sensor can be used to control motors 58a and 58b which move the table and handle, respectively, by means of lead screws (not shown). In this manner, the handle position can be automatically adjusted to achieve zero torque input and maintain the stabilizer in a level orientation. Figures 1 and 5 are reproduced below:





Schlumberger OBMI* Oil-Base MicroImager tool

30 In their skeleton arguments, the applicant has referred to a document from July 2006 regarding the OBMI* Oil-Base MicroImager tool. This tool provides a parallelogram arrangement for maintaining a sensor spaced apart from the walls of a downhole bore. An image from page 6 of the document is reproduced below:



Weatherford spinner assembly for flow measurement

31 In their skeleton arguments, the applicant has referred to an undated document regarding the Weatherford full-bore spinner mechanical (FBSM) tool. This tool uses sprung-loaded unequal arms to define a cage to protect a spinner, which cage provides a movable arrangement for maintaining a sensor spaced apart from the walls of a downhole bore. A picture of the tool from the document is reproduced below:

Baker Hughes' Sondex Production Array Imager (PAI) tool

32 In their skeleton arguments, the applicant has referred to a document from 2021 regarding the Sondex Production Array Imager (PAI) tool. The tool is used to identify fluid phases in highly deviated and horizontal wells. An array of 18 miniature sensors is mounted on an inside of an advanced deployment system which enables sensor arms to be positioned from a fully open diameter of 9 in. down to 3 in. accommodating a wide range of completion designs. The deployment arms can close down to an outside diameter of 21⁄8 in. with all sensors remaining operational. A picture of the tool from the document is reproduced below:

33 Baker Hughes' Capacitance Array (CAT004) Tool

34 In their skeleton arguments, the applicant has referred to a document from 2021 regarding a Capacitance Array Tool. This tool provides an array of 12 miniature sensors mounted on an inside of a set of collapsible bow springs that measure the capacitance of the surrounding fluid close to a well casing. This downhole tool is employed to identify fluid phases in highly deviated and horizontal wells. A picture of the tool from the document is reproduced below:

US 8925378 B2

35 In their skeleton arguments, the applicant has referred to US 8925378. It discloses an apparatus for making measurements in boreholes comprising a sonde having a radial array of arms movable between a closed and an open position. Each arm is connectable to a sensor pad. Figure 10 is reproduced below, showing the tool in borehole 102:

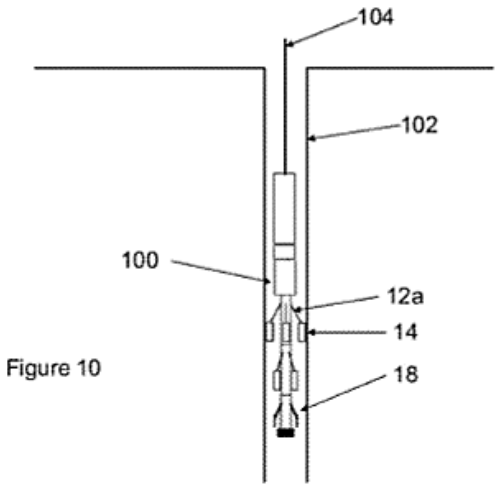


Figure 10

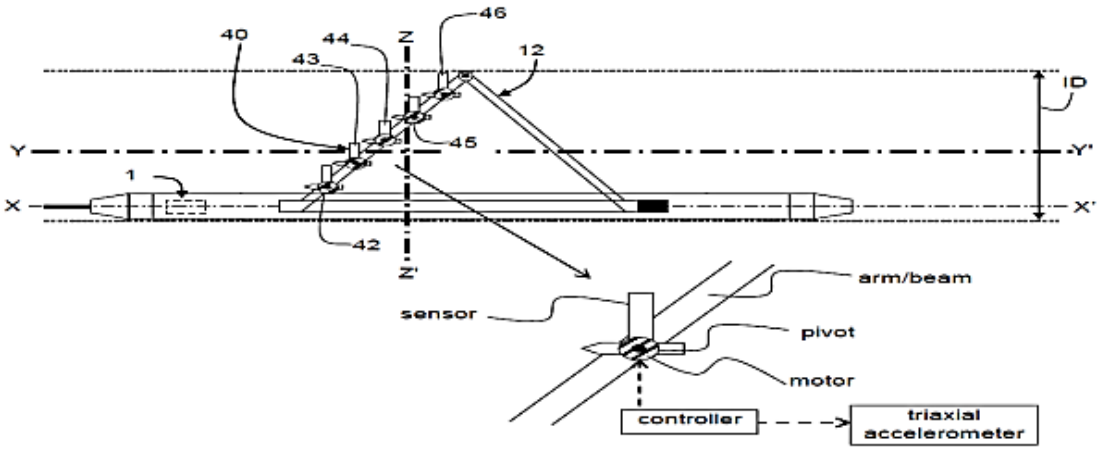
Analysis of clarity, support and sufficiency

36 At the hearing Mr Humphrey-Evans focussed initially on the pantographic mechanism used to maintain the orientation of the sensors. The examiner has accepted that such a mechanism is an enabling disclosure for positioning the capacitance sensing part axis (SA) of the electrode (50) substantially perpendicularly to said longitudinal axis (XX') or well axis (YY') for any opening of the deployment arms, based on the disclosure in FR 3118988. Mr Humphrey-Evans also submits that the design of devices capable of carrying components while maintaining them at a constant angle with respect to an axis of the device is part of the common general knowledge of the skilled petrochemical engineer – based on US 7114386 and US 9915144. In particular, US 7114386 discusses *"deformable parallelogram linkages or the equivalent".*

37 Mr Humphrey-Evans further discussed that methods alternative to the pantographic mechanism could be used to achieve the same effect. In particular, Mr Humphrey-Evans referred to page 8 lines 32-35 in the description of the current application as disclosing an active levelling embodiment for maintaining the orientation of the sensors. This reads:

"…Optionally, the production logging tool 1 may also comprise a triaxial accelerometer for controlling inclination and relative bearing in order to check whether or not the production logging tool 1 is correctly positioned/deployed in the well section to be measured…."

38 In this embodiment, each sensor is said to be coupled to the arm/beam by means of a motor. A triaxial accelerometer used to measure inclination of the tool and is coupled to the motor via an appropriate controller. The motor tilts the sensor according to the vertical/gravity vector whatever the angle/inclination of the arm/beam. Each sensor has its own active levelling device. He has provided a diagram of such an embodiment:



39 In support of this embodiment Mr Humphrey Evans has referred to a patent specification[6] related to camera stabilising which utilises similar, though more complex, principles. Specifically, an inner gimbal (carrying the element/camera) is mounted within an outer frame. It uses acceleration sensors and gyroscopes to detect the "local vertical" and any angular deviations. The sensors output signals to a controller that calculates the deviation from the gravity vector. Magnetic torque motors (servos) actively tilt the element based on the calculation.

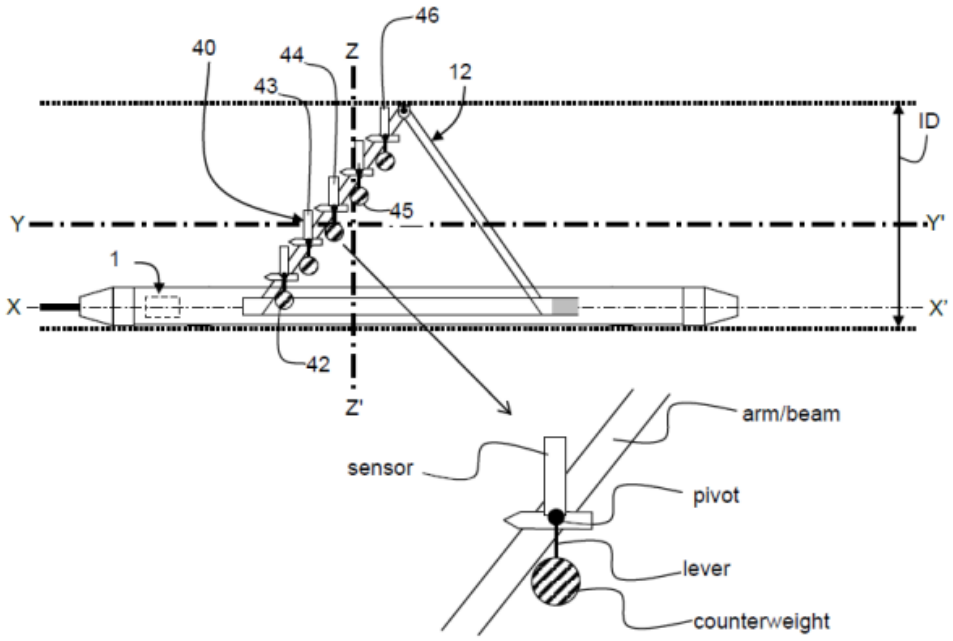
40 Mr Humphrey-Evans therefore submitted that there are at least two mechanisms discussed in the patent application such that enablement was not limited to a pantographic mechanism per se.

41 I would note that page 8 lines 32-35 in the description is not directed to the use of an accelerometer to operationally position a capacitance sensing part axis (SA). Rather this part of description is more generally directed to controlling inclination and relative bearing of the overall logging tool. Therefore, I do not consider the description to disclose the embodiment outlined above by Mr Humphrey-Evans. However, this part of the specification does point towards the general use of accelerometers for orientation purposes in a well section.

42 Mr Humphrey-Evans also detailed a further envisaged embodiment that, instead of having a pantographic mechanism, a simple counterweight and pivot mechanism could be utilised where the sensor element is kept vertical (and thus its support axis

[6] *At the hearing and in the skeleton arguments, Mr Humphrey Evans referred to US 5243370A for this embodiment. I believe US 5897223 is most relevant to this embodiment.*

horizontal). It was outlined that each sensor is coupled to the arm/beam through a pivot. A counterweight is coupled through a lever to the sensor. Thereby, the sensor is oriented according to the vertical/gravity whatever the angle/inclination of the arm/beam. Each sensor has its own self-levelling mechanism. He has provided a diagram of such an embodiment:



43 In support of this embodiment Mr Humphrey Evans has referred to a patent specification[7] describing a camera stabilizer according to a similar principle. The patent specification shows that, while modern Steadicams (RTM) try to achieve "neutral balance" (where the camera stays where you put it), the systems rely on static pendulous balance to force the camera back to vertical.

44 Mr Humphrey-Evans also argued that there are various non-pantographic mechanisms that can be employed for radial movement of sensors and the like outwardly from a production logging tool – and referred to the Non-Patent Literature documents and US 8925378 in this regard. For example, he noted that the OBMI Oil-Base MicroImager tool provides a parallelogram arrangement – as opposed to a pantographic mechanism – for maintaining a sensor spaced apart from the walls of a downhole bore, and the Baker Hughes' Capacitance Array (CAT004) Tool was distinctly not of a pantographic or parallelogram arrangement as it utilised curved spring wires.

45 Mr Humphrey-Evans also asserted that there was a general principle shown by the present invention and that, not only were there the pantographic and accelerometer embodiments for controlling inclination specifically described in the specification, but other embodiments could readily be described "without deeply thinking about it". At the hearing and during correspondence with the examiner, Mr Humphrey-Evans has broadly discussed further arrangements involving a series of enclosed belts, camshafts, gear linkages, a rack and pinion assembly and/or pulley mechanism that could enable pivotal movement of a number of sensors mounted about a pivot upon

[7] *At the hearing and in the skeleton arguments, Mr Humphrey Evans referred to US 5897223 for this embodiment. I believe US 5243370 is most relevant to this embodiment*

an arm. Mr Humphrey-Evans also considers that the skilled petrochemical engineer would be aware of the conditions downhole and be looking for simple but repeatable systems which will remain in operation despite the adverse environment (such as enclosed chain systems, enclosed cam belt systems).

46 In order to assess the clarity, support and sufficiency of the claims it is important that I identify the common general knowledge of the skilled person. Mr Humphrey-Evans has made several submissions in this regard, and I now ask what can reasonably be concluded from those submissions? It is fair to conclude that the skilled petrochemical engineer would have at least a working knowledge of common mechanical and/or electromechanical mechanisms, such as motors, pulleys, gears, rack and pinion etc. The common general knowledge also extends to commonplace sensors for determining inclination and/or orientation, such as accelerometers, inclinometers and gyroscopes. Indeed, such mechanisms and sensors can be considered general engineering tools such that they would be readily utilised for general engineering considerations in many disparate situations. I note in the pre-hearing report that the examiner has not necessarily disagreed that such mechanisms may form part of the common general knowledge of the skilled person.

47 The examiner has argued that the claims are insufficient by excessive claim breadth. In *Biogen*[2] it was held that, for the purposes of s.14(3), the disclosure must be sufficient to enable the whole width of the claimed invention to be performed, and the disclosure of a single embodiment will not always satisfy the requirement regardless of the width of the claim. In *Novartis*[3], Kitchen stated*: "In the case of a claim limited by function, it must still be possible to perform the invention across the scope of the claim without undue effort"*. I also note the summary of the relevant principles set out at [239] of *Eli Lilly*[8] to be applied when assessing s.14(3), in particular that the disclosure is aimed at the skilled person who may use their common general knowledge to supplement the information contained in the specification; the specification must be sufficient to allow the invention to be performed over the whole scope of the claim; and the specification must be sufficient to allow the invention to be so performed without undue burden.

48 The arguments provided by Mr Humphrey-Evans – the counterweight embodiment, the accelerometer embodiment, and other general arrangements – indicate that the skilled petrochemical engineer could readily achieve different means to position the sensors' capacitance sensing part axis in the manner claimed for any opening of the deployment arms in a substantially horizontal well section.

49 Consequently, whilst I consider that the specification only defines a single embodiment – the pantographic mechanism – of positioning a capacitance sensing part axis (SA) substantially perpendicularly to said longitudinal axis (XX') or well axis (YY') for any opening of the deployment arms, it is my opinion that Mr Humphrey-Evans has demonstrated that there are various relatively simple ways and means to implement the positioning of the capacitance sensing part axis (SA) of the electrode (50) substantially perpendicularly to said longitudinal axis (XX') or well axis (YY') for any opening of the deployment arms in a horizontal or highly deviated well section that would be derived by the skilled petrochemical engineer without undue burden or effort, using their common general knowledge, such as to allow the invention to be

[8] *Eli Lilly v Human Genome Sciences [2008] RPC 29*

performed over the whole scope of the claim. Furthermore, applying these various mechanisms to a downhole environment would not be a problem to skilled petrochemical engineer as they would know how to protect such a mechanism against adverse temperature, pressure etc.

50 With regard to the claims being unduly broad in scope and unclear, I consider that Mr Humphrey-Evans has demonstrated that the person skilled in the art, equipped with their common general knowledge, could realise various mechanisms to achieve the stated orientation of the sensors for any opening of the deployment arms in a horizontal or highly deviated well section without the use of inventive ingenuity, and that deriving such mechanisms would involve nothing more than trial and error, and that the desired orientation would be readily verifiable. Thus, limiting the claims to the pantographic mechanism based on the skilled person and their common general knowledge would unduly restrict the scope of the claims.

51 For similar reasons, upon reading the description, the person skilled in the art equipped with their common general knowledge would readily appreciate that means other than the pantographic mechanism could be used to orientate the axis of the sensors substantially perpendicularly to said longitudinal axis (XX') or well axis (YY') for any opening of the deployment arms. For example, the discussion of accelerometers on page 8 lines 32-35 indicates towards the use of alternative means. Thus, the claims are supported by the description.

Conclusion

52 I have found that claims 1 and 10 are clear, supported by the description and sufficient, and that the specification discloses the invention in a manner which is clear enough and complete enough for the invention to be performed across the scope of the claims by a person skilled in the art.

53 I make no assessment of inventive step under sections 1(1)(b) and 3 of the Patents Act 1977 because that is not an issue that was brought before me. I do acknowledge, however, that my assessment of the common general knowledge of the skilled person differs to that of the examiner, and that may impact the examiner's assessment of inventive step.

54 Therefore, I remit the application back to the examiner to re-examine the application and, if the examiners assessment of inventive step is unchanged, to complete the actions for grant.

Appeal

55 Any appeal must be lodged within 28 days after the date of this decision.

GEORGE TALBOT
Patent Examination Group Head