

**OPINION UNDER SECTION 74A**

|                     |                           |
|---------------------|---------------------------|
| Patent              | GB 2524311 B              |
| Proprietor(s)       | Downhole Products Limited |
| Exclusive Licensee  |                           |
| Requester           | Centek Limited            |
| Observer(s)         | Downhole Products Limited |
| Date Opinion issued | 25 August 2016            |

**The request**

1. The comptroller has been requested by Kilburn & Strode LLP on behalf of Centek Ltd (“the Requester”) to issue an opinion as to whether patent GB2524311 (“the Patent”) is valid in light of prior art documents D1-D8. An opinion is also sought regarding whether amendments made to the claims during prosecution of the Patent have resulted in matter disclosed in the Patent extending beyond that disclosed in the application for the Patent as filed.
2. The request was received on 1 June 2016. It was accompanied by a statement explaining the request as well as copies of the eight prior art documents along with English language translations of D3, D4, D7 and D8.

**Observations & Observations in reply**

3. Observations were received on 5 July 2016 from Murgitroyd on behalf of the proprietor, Downhole Products Limited (“the Observer”). The observations included arguments refuting the allegations of lack of validity along with accompanying diagrams. Observations in reply were received from the Requester on 19 July 2016.

**Whether the request should be refused**

4. The Observer has argued that the request regarding added matter should be refused as it is merely repeating arguments made and rejected during prosecution of the Patent. In response, I note that although the examiner would have considered the possibility of added matter when amendments were made, at no point did he raise any such objection. Therefore I am satisfied that in the circumstances it would be appropriate to issue an opinion on this.

5. The Observer has also argued that the request on the question of validity in light of the provided documents should be rejected because the arguments have been and are being explored by the EPO. The Requester concedes that third party observations have been submitted to WIPO on 3 June 2016 in respect of the Patentee's corresponding international application PCT/GB2015/050416 with similar claims but notes that these observations were filed with WIPO after the opinion request was filed with the IPO. The third-party observations are very similar to the current opinion request. The Requester points out that the third-party observations will not be considered during the international phase and will only be forwarded to the national offices if the applicant chooses to enter the national and regional phase. I agree with the Requester that these third-party observations should not stand in the way of this opinion.
6. The Requester also concedes that documents D1 and D8 were cited in the international search report (ISR). The ISR was issued on 24/6/15 by the EPO; D1 was cited under category X and D8 under category A. A related written opinion was issued in which a novelty objection was raised against all of the claims in light of D1. The ISR was brought to the attention of the IPO examiner pre-grant via a letter from the applicant's representative dated 2/12/15 and amendments were made to independent claim 1 in light of the disclosure in D1. Therefore the UK examiner was aware of the novelty objection regarding D1 and would have considered D1 before granting the Patent. However, the current opinion request also concerns an inventive step argument in light of D1 and the seven other documents. Therefore I will focus this opinion on this new question of inventive step. I note also that the Requester in their observations in reply have withdrawn their comments on the novelty of the claims of the Patent in view of either D2 or D8.
7. Further document D3 was cited under category X by the UK examiner in his first examination report. However, the question of whether the claims are inventive in light of this document and the others presented has not been explored and therefore as above will be covered as part of this opinion.

## **The Patent**

8. The Patent entitled "Centraliser" was filed on 20 March 2014, was granted on 9 March 2016 and is still in force.
9. The Patent relates to a centraliser used to maintain a minimum stand-off or radial distance between the inner surface of a bore of an oil or gas well and a tubular within the bore. The centraliser has end collars 15, 16 with resilient strips of metal extending radially outwards between them in the form of bows or springs 20, 30. The springs are compressed when the centraliser is inserted into the bore to hold the tubular near to the centre of the bore. In the invention, the springs are asymmetric in the longitudinal direction, each with two portions of different curvature e.g. a convex portion 21 and a concave portion 25. The springs are arranged in two interleaved sets around the circumference of the collars with the springs 20 of the first set reversed longitudinally compared with the springs 30 of the second set. The arrangement reduces the force required to feed the tubular into the bore. (See Figures 1 and 4 reproduced below.)

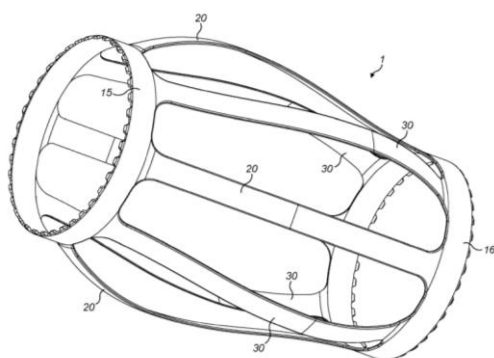


FIG. 1

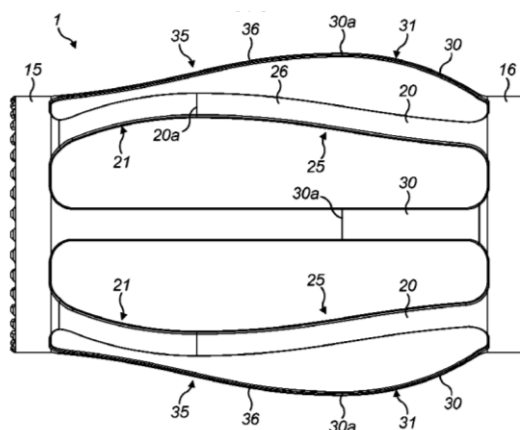


FIG. 4

10. There are 28 claims including one independent claim, claim 1. Claim 1 reads as follows in the form discussed in the submissions with the features separated out:

**1a** A centraliser having a central longitudinal axis,  
**1b** and having first and second axially spaced collars  
**1c** and first and second sets of resilient devices extending between the collars  
**1d** wherein the resilient devices in each set are spaced around the circumference of the collars,  
**1e** each of the resilient devices comprising a first arc and a second arc  
**1f** wherein the curvature of the second arc is inverted with respect to the curvature of the first arc,  
**1g** and wherein each resilient device is asymmetric along the central longitudinal axis,  
**1h** and wherein in each resilient device in the first set, the first arc extends radially outward from the first collar at an angle,  
**1i** and the second arc extends radially outward from the second collar at an angle,  
**1j** and wherein in each resilient device of the second set, the first arc extends radially outward from the second collar at an angle  
**1k** and the second arc extends radially outward from the first collar at an angle.

11. I will begin by considering the question of added matter and then move on to consider whether the claims involve an inventive step.

### Added matter - the law

12. The section of the Act concerning added matter is section 76(2), which reads:

*76(2) 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.*

13. In *Bonzel and Schneider (Europe) AG v Intervention Ltd* [1991] RPC 553 Aldous J described the task of determining whether an amendment to the description had the

result that a patent as granted disclosed matter which extended beyond that disclosed in the application as:

*(1) to ascertain through the eyes of the skilled addressee what is disclosed, both explicitly and implicitly in the application;*  
*(2) to do the same in respect of the patent as granted;*  
*(3) to compare the two disclosures and decide whether any subject matter relevant to the invention has been added whether by deletion or addition. The comparison is strict in the sense that subject matter will be added unless such matter is clearly and unambiguously disclosed in the application either explicitly or implicitly.*

14. In Richardson-Vicks Inc.'s Patent [1995] RPC 568 Jacob J summarised this by saying: "the test of added matter is whether a skilled man would, upon looking at the amended specification, learn anything about the invention which he could not learn from the unamended specification."

### **Added matter - arguments**

15. The Requester originally identified details in claims 1, 17 and 30 that in their view following amendment resulted in added matter. In the observations in reply the Requester withdrew their comments regarding amendments made to claims 17 and 30. There remains two alleged instances of added matter for me to consider regarding claim 1.
16. The first of these relates to an amendment made on 4 March 2015 to claim 1 to specify that "the resilient devices in each set are spaced around the circumference of the collars". The basis for this amendment was provided by claim 19 as originally filed, which specified that "the resilient devices are provided in sets, and wherein the resilient devices are spaced equidistantly around the circumference of the collars". The Requester asserts that the amendment to claim 1 adds matter because it does not specify that the resilient devices are spaced **equidistantly** around the circumference of the collars as specified previously in claim 19. They maintain that original claim 19 taught the two features in combination namely the resilient devices being provided in sets **and** having equidistant spacing. They also maintain that non-equidistant spacing of the resilient devices is not clearly and unambiguously disclosed in the application as filed.
17. In reply the Observer points out that the wording of claim 1 as filed recites "at least one resilient device" with no requirement that the devices must be equidistantly spaced. Further, they refer to the description on pages 3 and 4 starting at line 26 which states that "a first pair of resilient devices can be spaced at 180° ..." and "In certain other examples a set of three resilient devices can be spaced at 120° ...". They maintain that the use of the term "can be" means the skilled reader would understand that an alternative spacing could be used. They further provide drawings of centralisers with first and second sets of resilient devices spaced at unequal distances around the circumference of the collars and use this as evidence that non-equidistant spacing of springs would be part of the common general knowledge of the skilled person.

18. What is important for me to assess here is whether the absence of the requirement for the resilient devices in sets to also be equidistantly arranged around the circumference adds any new information from that originally filed. My view is that it does not. Although the embodiments described in the paragraph bridging pages 3 and 4 only include equidistantly arranged springs, I am of the view that the skilled person would realise that other configurations would be possible and were intended. I think this is supported, as the Observer points out, by the fact that although there is no requirement for sets, original claim 1 did not specify equidistant spacing. Indeed, it seems to me from the Patent specification as a whole and as originally filed that the skilled person would conclude that it is not essential for the springs to be equidistantly spaced for the invention to function. Therefore it is my view that no matter has been added with this amendment.
19. The second alleged instance of added matter relates to a further amendment to claim 1 made on 2 December 2015 to include features 1h-1k detailed above. In particular the Requester maintains that there is no basis for either of the first or second arcs extending “at an angle”. They refer to the description and allege that there is only support for the arcs extending at an angle of approximately 5° or 40°.
20. In response, the Observer maintains that the angles of approximately 5° and approximately 40° would be understood by the skilled addressee as being described by way of example only. Also they maintain the skilled person would understand from their general knowledge that the precise angles need to vary in real life to accommodate a wide variety of dimensions of inner and outer pipe.
21. Again, it important to assess whether the amendment, by not specifying the specific angles, adds any new information. Again it is my view that it does not. I agree with the Requester that the embodiments only specify angles of 5° or 40°. However, I concur with the Observer that the skilled person would realise that these were only examples and other angles could be envisaged. Indeed, it seems to me that these particular angles are not essential to the working of the invention and other angles would still allow the invention to function as described; this I assume would also be apparent to the skilled person. It seems reasonable, as the Observer points out, that the skilled person would be aware that other angles may even be necessary in different applications. Therefore it is my view that no matter has been added with this amendment.

### **Inventive step – the law**

22. The relevant provisions in relation to inventive step are section 1(1)(b) and section 3 of the Patents Act 1977, which read:

*1(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say –*

*(a) ...*

*(b) it involves an inventive step;*

*3 An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding*

section 2(3) above).

23. The Court of Appeal in *Windsurfing*<sup>1</sup> formulated a four-step approach for assessing whether an invention is obvious to a person skilled in the art. This approach was restated and elaborated upon by the Court of Appeal in *Pozzoli*.<sup>2</sup> Here, Jacob LJ reformulated the *Windsurfing* approach as follows:

- (1)(a) *Identify the notional “person skilled in the art”*
- (1)(b) *Identify the common general knowledge of that person;*
- (2) *Identify the inventive concept of the claim in question or if that cannot be readily done, construe it;*
- (3) *Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed.*
- (4) *Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps that would have been obvious to the person skilled in the art or do they require any degree of invention?*

24. I will therefore use this *Windsurfing/Pozzoli* approach to assess whether independent claim 1 involves an inventive step in light of documents D1-D8. Only if I find claim 1 to be invalid will I consider the validity of the dependent claims.

## **The Windsurfing/Pozzoli steps**

*Steps 1(a) and 1(b): Identify the notional “person skilled in the art” and the common general knowledge of that person*

25. There has been some disagreement between the Requester and Observer regarding the nature of the person skilled in the art. I agree with the more specific definition provided by the Requester that they would be an engineer or workshop technician (or possibly a team of such persons) concerned with the design and/or manufacture of centralisers.
26. Again I agree with the Requester that the common general knowledge of the skilled person would include knowledge of conventional centraliser designs and how centralisers are used in the field, along with knowledge of typical industry problems. I note, however, that the contents of individual patent specifications do not normally form part of the relevant common general knowledge.

*Step (2): Identify the inventive concept of the claim in question or, if that cannot be readily done, construe it.*

27. I note the well-known authority on claim construction which is *Kirin-Amgen and others v Hoechst Marion Roussel Limited and others* [2005] RPC 9. This requires that I put a purposive construction on the claim, interpret it in the light of the description and drawings as instructed by section 125(1) of the Act and take account of the Protocol to Article 69 of the EPC. Simply put, I must decide what a person

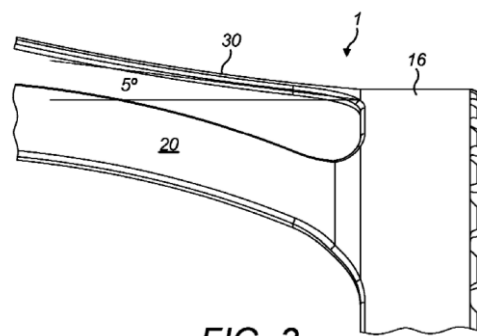
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<sup>1</sup> *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd*, [1985] RPC 59

<sup>2</sup> *Pozzoli SPA v BDMO SA* [2007] EWCA Civ 588

skilled in the art would have understood the patentee to have used the language of the claim to mean. I will use this approach when required.

28. In general, I think there is little difficulty in interpreting claim 1. There are, however, a few terms that are worthy of consideration.
29. Firstly, I consider that the skilled person would understand the patentee to have used the term 'arc' to mean a curved portion of the resilient device. This is clear from both the specification as a whole and common usage of the term.
30. The next phrase to consider is where the first or second arc "extends radially outward ...at an angle" from either the first or second collar in parts 1h-1k of claim 1. The Requester construes this to mean that the arc may extend at any angle from 0 – 360°. However, I agree with the Observer who points out that the word 'outward' would lead the skilled person to interpret the angle as one greater than 0°. I think the skilled person would also realise that the angle must be less than 90° so that the arc of the spring is directed along the longitudinal axis of the device and also 'radially' i.e. perpendicular to this axis. The Observer points out, in my view correctly, that the skilled person from consideration of for example Fig. 3 (reproduced below) would conclude that the arc must make the angle with the collar at the attachment point, not at some point along its length.



31. I think it is worth noting from the description that in claim 1 the 'first arc' is a particular type of arc for example convex and the 'second arc' is another particular type of arc for example concave where the curvature of the two are inverted with respect to one another (features 1e and 1f). It seems to me that this has the knock-on effect in features 1h-1k that for the first set of resilient devices the first arc extends from the first collar and the second arc extends from the second collar whereas for the second set of resilient devices they are reversed in some way so that the first arc now extends from the second collar and the second arc extends from the first collar. Therefore to exhibit these features the skilled person would realise that the springs must each be longitudinally asymmetric *and* also reversed longitudinally in some way between sets. This can be seen in the invention from Figures 1 and 4 reproduced above.
32. Again there has been some disagreement regarding the inventive concept of claim 1. In this case I agree with the Observer and consider the inventive concept to be: a centraliser having first and second sets of resilient devices, each of the resilient devices comprising a first arc and a second arc wherein the curvature of the second arc is inverted with respect to the curvature of the first arc, and wherein each resilient

device is asymmetric along the central longitudinal axis, and wherein in each resilient device in the first set, the first arc extends radially outward from the first collar at an angle and the second arc extends radially outward from the second collar at an angle, and wherein in each resilient device in the second set, the first arc extends radially outward from the second collar at an angle and the second arc extends radially outward from the first collar at an angle.

*Step (3): Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or claim as construed.*

*Step (4): Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps that would have been obvious to the person skilled in the art or do they require any degree of invention.*

33. I will deal with steps 3 and 4 together. The Requester referred to eight patent documents D1-D8. I will consider each in turn. I note that each was published before the filing date of the Patent and therefore forms part of the state of the art.
34. D1 is patent application WO 2011/018617 A1. It discloses a one-piece centraliser with opposing end collars 210,220 axially separated by spring bows 240-245. In the illustrated embodiment (Fig. 4 reproduced below and described on page 10 lines 11-29) there are 6 bows separated into two sets of three in a circumferential direction. In the first set, bows 241, 243, 245 extend from the first collar 210 with a portion 241a, 243a, 245a ‘substantially axis parallel’ for a first distance before extending into a continuously curved portion 241b, 243b, 245b to the second collar 220. The bows of the second set 240, 242, 244 are reversed so that they extend through curved portions 240b, 242b, 244b from the first collar 210 and into a ‘substantially axis parallel’ portion 240a, 242a, 244a to the second collar 220.

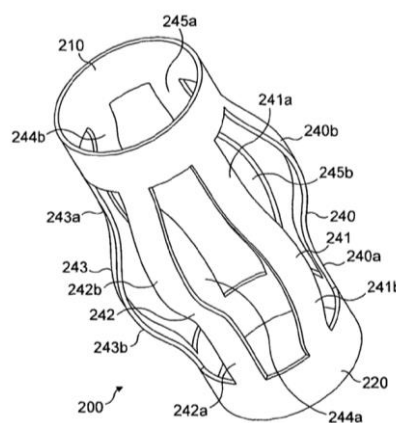


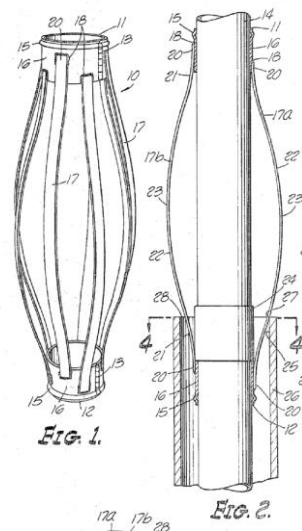
FIG. 4

35. Therefore D1 clearly discloses features 1a-d and 1g of claim 1. From the description on page 10, each of the bows has two portions, a curved portion and one that is ‘substantially axis parallel’ i.e. not curved. The latter therefore can’t be described as an ‘arc’. Fig. 4 is drawn in a relaxed way where it could be argued that the bows in the curved portion exhibit both concave and convex sub-portions possibly with a convex sub-portion located between two concave sub-portions. This would then meet the terms of features 1e and 1f. The bows are reversed longitudinally between

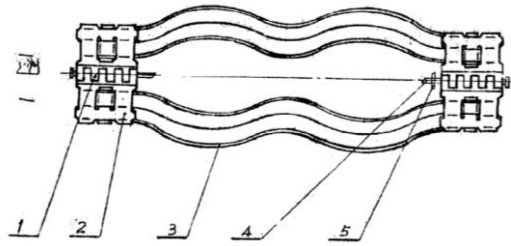


sets and so the disclosure meets the terms of features 1h and 1j. In particular each bow has a concave sub-portion or arc adjacent one collar and extending radially outward at an angle as construed above.

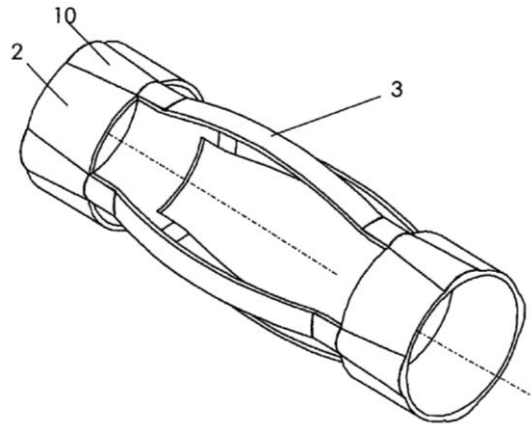
36. However, the 'substantially flat portion' meets either the first or second collar for each bow rather than a second arc. Therefore in my view it is not possible for the disclosure to meet the terms of features 1i and 1k as there is not an arc extending from both collars at an angle *at the attachment point* (as construed above) for each bow. The Requester has argued that there is some uncertainty allowed in construing 'substantially axis parallel' to permit a small angle of inclination. However, to my mind that does not alter the fact that this portion cannot be described as an 'arc' and therefore the disclosure fails to meet the terms of features 1i and 1k as explained above.
37. D2 is patent document US 3575239 B. It discloses a centraliser with a number of identical springs stretching between two collars. The springs are arranged in two sets, longitudinally offset with respect to one another and the mid-point of the centraliser. Each spring has a relatively straight mounting portion 20, joined to a generally curved, concave portion 21 and then later to a generally curved, convex central portion 22 before repeating in reverse to form a symmetrical shape overall. (See Figures 1 and 2 reproduced below.) Therefore D2 meets the terms of features 1a-1f but not 1g. Even if it could be argued that arc portion 21 extends radially outward from the collars at an angle, because the same portion is present at each end of each spring there cannot be a second arc of inverted curvature extending from a collar to satisfy features 1i and 1k. Therefore D2 also fails to meet at least these two further features 1i and 1k.



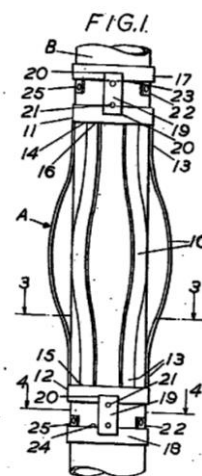
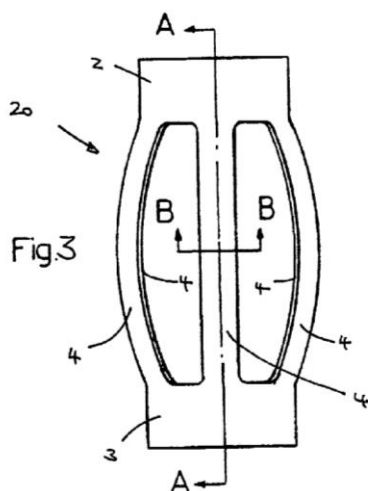
38. D3 is patent application CN 2119492 U. It discloses a centraliser with a plurality of seemingly identical, undulating springs of longitudinally-symmetrical shape arranged between two collars. (See Figure 1 reproduced below.) Each spring appears to have alternate convex and concave portions with a concave portion in the centre. If we assume the springs are arranged in sets in some way, D3 meets the terms of features 1a-1f, 1h and 1j but not features 1g, 1i and 1k.



39. D4 is patent application DE 102005040482 A1. It discloses a centraliser with a plurality of seemingly identical, longitudinally-symmetric, outwardly-bowed springs between two collars. (See Figure 4 reproduced below.) The springs have a single arc and appear to meet the collars at  $0^\circ$  via an initial flat portion at each end. If we assume the springs are arranged in sets in some way, D3 meets the terms of features 1a-1d but not 1e-1k.



40. D5 is patent document US 6997254 B2. It discloses a centraliser with a plurality of identical, longitudinally-symmetric, outwardly-bowed springs between two collars. (See Figure 3 reproduced below.) D5 meets the terms of 1a-1d, 1h and 1j. However, D5 fails to exhibit features 1e, 1f, 1g, 1i and 1k.



41. D6 is patent application GB 689807 A. It discloses a centraliser with a plurality of

D7 is patent application RU 2274744 C1. It discloses a centraliser with springs of a generally convex shape stretching between two collars. (See Figure 1 reproduced below.) The springs are identical and are each longitudinally-symmetric but arranged in two sets longitudinally offset with respect to one another and the mid-point of the centraliser. Therefore D7 exhibits features 1a-1d. The springs only have one arc so although D7 meets the terms of 1h and 1j it fails to meet the terms of features 1e, 1f, 1g, 1i and 1k.

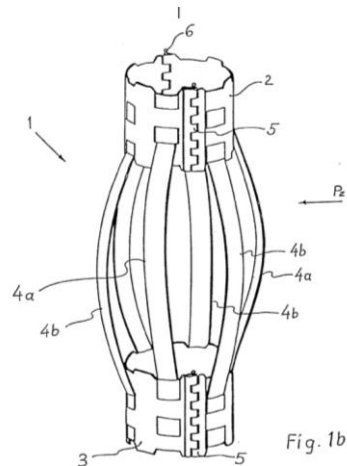


Fig. 1b

43. D8 is patent application DE 3508086 C1. Again, it discloses a centraliser with springs of a generally convex shape stretching between two collars. (See Figure 1b reproduced above.) The springs are identical and are each longitudinally-symmetric but arranged in two sets longitudinally offset with respect to one another and the mid-point of the centraliser. Therefore D8 exhibits features 1a-1d but not 1g. The springs only have one arc so it also does not meet the terms of 1e and 1f. The springs appear to slot into the collars via short flat portions. However, even if it could be argued that the arc of each spring extends radially outward from the collars at an angle, D8 still fails to meet further features 1i or 1k.
44. So looking at all the documents D1-D8 the difference between the disclosures in them and the inventive concept of claim 1 is that none of them discloses features 1i or 1k. As discussed above the missing features require the springs to be longitudinally asymmetric *and* also reversed longitudinally in some way between sets. In all of documents D2-D8 the springs are identical and each spring is longitudinally symmetrical about its mid-point; the only difference between sets which occurs in some documents is a longitudinal offset. There is no suggestion in any of D2-D8 of making the springs longitudinally asymmetrical or reversing them longitudinally between sets. I do not see how the skilled person could arrive at claim 1 from any of these documents and common general knowledge alone.
45. D1 is the closest prior art. It does disclose longitudinally-asymmetric springs reversed longitudinally between sets. However, as discussed above it does not have

the necessary second arc of inverted curvature adjacent to the collars but instead has a substantially flat portion. It would not be obvious in my view to adapt the springs of D1 to include this feature employing only common general knowledge as it would require a considerable re-design and no apparent motivation from the document to do so. As pointed out by the Requester some of the documents (D3, D5 and D7) disclose springs without axis parallel portions adjacent the collars. However, as discussed above none of these disclose asymmetric springs and so could provide the necessary teaching to modify the disclosure in D1. Therefore even by combining the disclosures in documents D1-D8, claim 1 in my view remains inventive.

46. I have found claim 1 to be inventive; therefore I do not need to consider the validity of the dependent claims.

## **Opinion**

47. It is therefore my opinion that the claims of the Patent are inventive in light of the prior art provided by the Requester. Further, I am of the opinion that no matter was added following amendment of claim 1 during prosecution of the Patent.

Susan Dewar  
Examiner

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## **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.*