

OPINION UNDER SECTION 74A

Patent	GB 2563239 B
Proprietor(s)	Vulcan Completion Products UK Ltd
Exclusive Licensee	
Requester	Pinsent Masons LLP on behalf of Shaanxi Newland Industrial Corp. Ltd
Observer(s)	Marks & Clerk LLP
Date Opinion issued	13 November 2024

The request

1. The Comptroller has been requested by Pinsent Masons LLP (the Requester) to issue an Opinion on whether GB 2563239 B (the Patent), in the name of Vulcan Completion Products UK Ltd, is valid.

2. In particular the Requester seeks an Opinion on whether the Patent is valid with respect to novelty in light of the following documents;

PM1: CN 205654308 U,

PM2a: “Pushing the envelope in deepwater cementing”, Drilling Contractor, 22 June 2016, <https://drillingcontractor.org/pushing-envelope-deepwater-cementing-39699>,

PM2b: Innovex - CentraMax CT PI1
<https://www.youtube.com/watch?v=v9EpDoxfmhA>,

PM3: WO 2011/018617,

PM4: EP 2960426,

PM5: Downhole Products brochure entitled “Casing Accessories and Completion Tools”,

PM6: Downhole Products technical sheet for Expand-O-Lizer ES Centralizer,

PM7: Downhole Products brochure entitled “Expand-O-Lizer URS – Under-Reamed Service,

PM8: US 3312285A,

PM9: WO 2016/030689,

PM10: US 2727576A,

PM11: CN 106150397 A.

3. Observations were received from Marks & Clerk LLP (the Observer) 17th September 2024, which include arguments as to why the Patent is novel with respect to PM1-PM11. Observations in reply were received 2nd October 2024.

Preliminary matters

4. The opinion request contends that PM1, PM2b and PM3 can be used to assess novelty **and** inventive step of the claims of the Patent. However, the reasoned arguments put forward in the request are restricted to the issue of novelty. Therefore my opinion will similarly be restricted.

5. PM2a is dated 22nd June 2016, and discusses CentraMax centraliser models PI1 and PT1. PM2b, dated 9 October 2017, discusses the manufacture and use of the CentraMax PI1. PM2a is therefore provided as evidence to demonstrate that the CentraMax PI1, arguably discussed in greater detail in PM2b, was available prior to the filing date of the Patent. In light of PM2a, and other readily available online references to the CentraMax PI2, I am content that the system set out in PM2b was available at the time of filing the Patent.

6. PM7 is a specification brochure of a centraliser manufactured by Downhole Products trademarked Expand-O-Lizer Under-Reamed Service (URS) and has no publication date. Furthermore, the Requester does not provide any indication that this document was available at the time of filing. However, the specific centraliser is disclosed in PM5, dated 2015. Therefore I am content that the Expand-O-Lizer URS, as disclosed in PM7, was available at the time of filing the Patent.

7. The office will not issue an opinion if for any reason it considers it inappropriate in all circumstances to do so, and therefore requests which do no more than repeat arguments already considered pre-grant will be refused. PM9 was cited in the X category against the equivalent international application published as WO 2018/224825 A1. The examiner of the Patent is obliged to inspect the file of equivalent applications and has explicitly inspected the online file, including associated citations, relating to WO 2018/224825 A1. Furthermore, the request does not provide any reasoned argument regarding the relevance of PM9 beyond simply stating that claim 1 of the Patent is anticipated by PM1. Consequently, consideration of PM9 with respect to novelty does not appear to raise a new question, and if it does then the question is not adequately set out. Therefore I have set aside PM9.

8. The Requester argues that claim 1 of the Patent is not novel over PM1-PM9, and that claims 9-11 of the Patent are not novel over PM1 exclusively. The Requester additionally argues that the features of claims 2-5 of the Patent are not novel with respect to PM10 and PM11 but omits any argument or statement relating to the relevance of either PM10 or PM11 in regard to claim 1 which claims 2-5 are appended to.

9. The Requester additionally argues that the features of claim 6 of the Patent are not novel with respect to PM1. However, claim 6 is directly appended to claims

2-5 and the Requester has not made any argument or statement relating to the relevance of PM1 in regard to claim 2-5. Therefore I am unable to consider the novelty of claim 6 with respect to PM1.

10. The Requester additionally argues that the features of claim 12 of the Patent, which is directly appended to claim 11, is not novel with respect to PM1-PM11. However, the request restricts its discussion of claim 11 to PM1 therefore consideration of claim 12 can only be made with respect to PM1.

11. The requester additionally argues that claims 27 and 28 of the Patent are not novel with respect to PM4 and PM9, respectively.

12. Therefore I will only consider the validity of claim 1 with respect to PM1-PM8. Furthermore, if I find claim 1 to lack novelty over PM1, I will only consider the validity of claims 9-12 with respect to PM1. Additionally, if I find claim 1 to lack novelty over PM4, I will only consider the validity of claims 27 with respect to PM4.

The Patent

13. The Patent was granted 25th March 2020 and has a priority date 7th June 2017. The Patent is in force.

14. The Patent relates to an apparatus for centralising a tubing within a borehole. The role of the centraliser is to ensure the tubing is arranged centrally with respect to a borehole such that a settable material, such as cement, may be circulated between the tubing and the inner wall of the borehole in order to provide a seal. Using a centraliser maintains a uniform thickness of the settable material.

15. The Patent is directed towards a bowspring type centraliser which generally comprise first and second spaced apart end collars having a plurality of resilient bowsprings therebetween. The Patent acknowledges EP 0297716 and US 6997254 as representative of the art, both of which disclose typical bowspring centralisers. Additionally, EP 0297716 discusses a method of forming opposing ring portions integrally with joining spring portions.

16. The Patent identifies a problem with using the prior art bowspring centralisers in deviated, or horizontal, bores wherein the weight of the tubing may deform the spring portion of the centraliser such that the tubing tends towards the lower internal surface of the borehole, as shown in figure 1 of the Patent which is reproduced below. The Patent attempts to remedy the problem by reconfiguring the spring portion such that end portions of the spring are relatively more flexible than a central portion of the spring; this is apparently achieved by providing the central portion with a smaller convex radius, than a concave radius of the end portions.

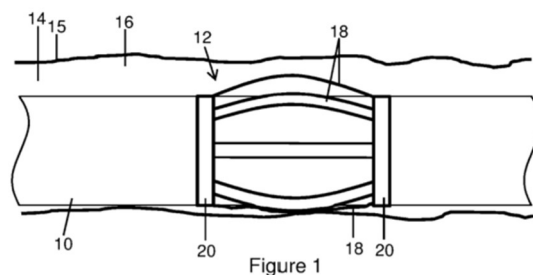
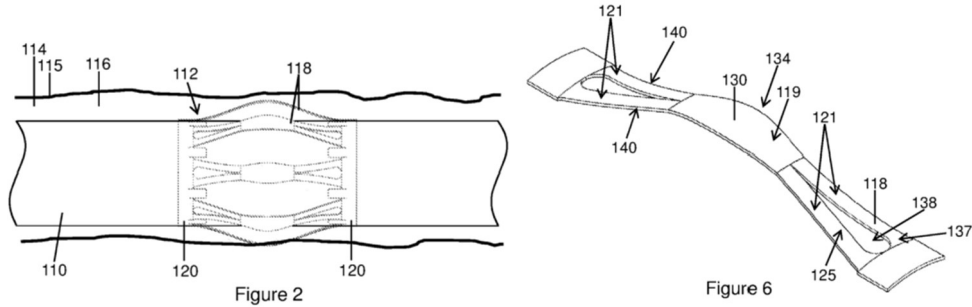


Figure 1

17. Referring to figures 2 and 6 of the Patent, which are reproduced below, the Patent includes a centraliser 112 comprising end collars 120 arranged at either end of the centraliser, and longitudinal members 118 which extend parallel to a main axis of the centraliser. The end collars and longitudinal members are integrally formed, and the longitudinal members are resilient such that they can deform, with respect to an irregular inner surface of a borehole, when the centraliser and associated tube is passed into a borehole.



18. The Patent is characterised by the profile of the longitudinal members which each comprise an intermediate portion 119 and end portions 121 wherein the intermediate portion comprises a convex outer surface having a first radius of curvature, and the end portions have a concave outer surface having a second radius of curvature being greater than the first radius of curvature.

19. The Patent has a single independent claim which I have provided below including references used by the Requester in their request, as well as my own references.

Claim 1

- 1.1 A centraliser for centralising tubing in a bore, comprising:
- 1.2 end collars connected by members,
- 1.3 wherein the members are integral with the collars, the members and the collars forming a one-piece construction,
- 1.4 wherein the members comprise an intermediate portion and end portions for connecting the intermediate portion to the end collars,
- 1.5 wherein the centraliser is configurable between a larger diameter configuration in which the intermediate portion assumes a radially outer position with respect to the centraliser and a smaller diameter configuration in which the intermediate portion assumes a radially inner position,
- 1.6 wherein the end portions are configured to permit movement of the intermediate portion between the radially outer and inner positions, and
 - 1.6.1 the intermediate portion is relatively less flexible than the end portions,
- 1.7 wherein the intermediate portion comprises a curved section, defined in a direction along the members, defining a first radius of curvature, the

intermediate portion defining a convex outer surface, and

1.8 wherein the end portions comprise a curved section, defined in the direction along the members, defining a second radius of curvature, the second radius of curvature being greater than the first radius of curvature defined by the intermediate portion, the end portions defining a concave outer surface.

Claim construction

20. Before I can determine whether the claims of the Patent lack an inventive step I must first construe them. This means interpreting the claims in light of the description and drawings as instructed by section 125(1) which reads:

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.

21. 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 claim to mean. This approach has been confirmed in the decisions of the High Court in *Mylan v Yeda*¹ and the Court of Appeal in *Actavis v ICOS*².

22. In order to interpret the claims through the eyes of the skilled person, they must first be identified.

23. The skilled person would be a manufacturer of down-hole pipe systems and their ancillaries, including centralisers of various types.

24. The language of the claim is plain and presents no particular problem in construing the precise scope. The Requester has comprehensively set out how the claim ought to be construed in their request and it is noted that there is no specific contention from the Observer. I am largely in agreement with how the Requester has construed the claim, aside from their interpretation of 1.3.

25. In relation to 1.3, the Requester argues that providing the collars and members as a one-piece construction has little to no technical significance for the functioning of the centraliser and that this limitation is merely a manufacturing consideration.

26. I agree that a unitary construction appears to restrict the manufacture of the centraliser to specific methods however I am in no doubt that this restriction goes beyond merely a manufacturing consideration as there are clear technical

¹ Generics UK Ltd (t/a Mylan) v Yeda Research and Development Co. Ltd & Anor [2017] EWHC 2629 (Pat)

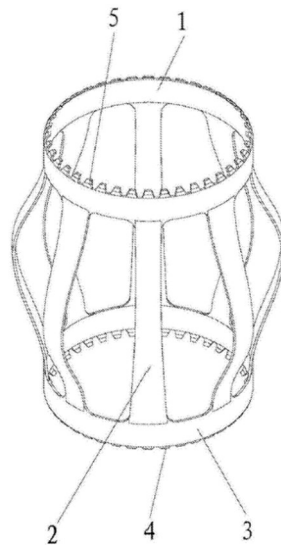
² Actavis Group & Ors v ICOS Corp & Eli Lilly & Co. [2017] EWCA Civ 1671

advantages of a unitary construction relating to structural properties of the centraliser and also in regard to ease of installation. Therefore, in my opinion, the restriction set out in 1.3 is non-trivial and ought to be considered with respect to any assessment of validity.

27. I have no further observations in respect to claim construction and, in the absence of any contention, I am content to proceed with the opinion on the basis of the Observers construction whilst taking account of my comments in regard to 1.3.

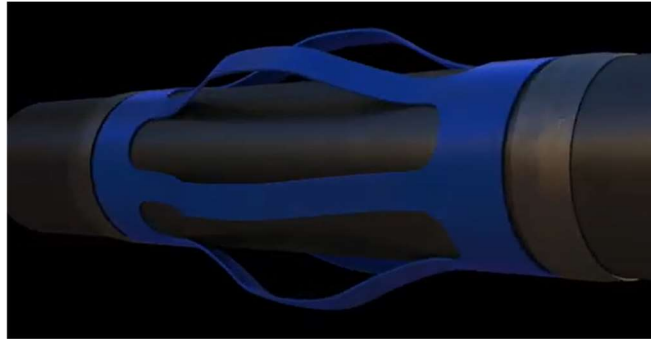
The prior art

28. PM1 discloses a bowspring centraliser comprising a pair of spaced apart collars 1, 3 connected by a plurality of ribs 2 circumferentially arranged around the collars as illustrated in the figure below, which is an extract from PM1. The ribs are made of 'circular arc-shaped elastic steel sheet' and the collars and ribs are of unitary structure.



29. The ribs are bowshaped, and an apex of adjacent ribs are staggered to reduce an entry force when inserting the centraliser into a borehole. It is clear from the figures that the centraliser of PM1 has a convex portion providing the apex and concave portions between the convex portion and the first and second collar. In a first disclosed embodiment the rib is narrowed at an upper end and widened at a lower end. In a second embodiment, as illustrated above, the rib is narrowed and widened at upper and lower ends in an alternating pattern. The narrowing and widening of the rib are alleged to increase the elasticity of the rib.

30. PM2a and PM2b each disclose the manufacture and use of a CentraMax PI1 which is a single-piece construction bowspring slip-on centraliser as illustrated below, which is an extract from PM2b.



31. The CentraMax PI1 comprises opposing collars with bowsprings therebetween wherein each bowspring defines a generally convex outer profile. The CentraMax PI1 is used in a conventional manner which is clearly demonstrated in the video PM2b.

32. PM3 discloses a centraliser formed from a single sheet of boron steel and comprises first and second opposing end collars that are axially separated by a plurality of bowsprings as illustrated below, which is an extract from PM3. The bowsprings comprise a generally straight first section 241a which extends into a continuously curved portion 241b; the figure below clearly illustrates a convex curved portion and a concave transition portion.

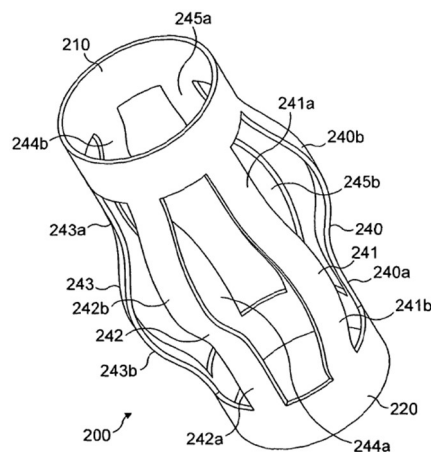
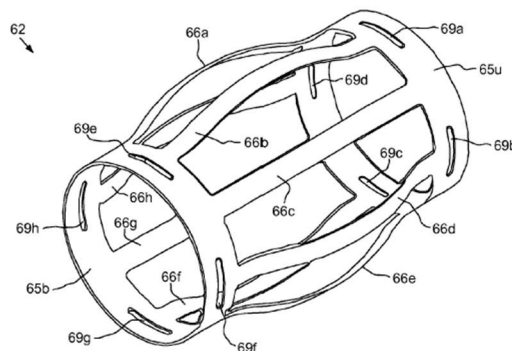


FIG. 4

33. PM4 discloses a centraliser 62 as illustrated below, which is an extract from PM4, comprising opposing collars 85 and bowspring ribs 66 therebetween. The centraliser of PM4 may be formed of a one-piece construction.

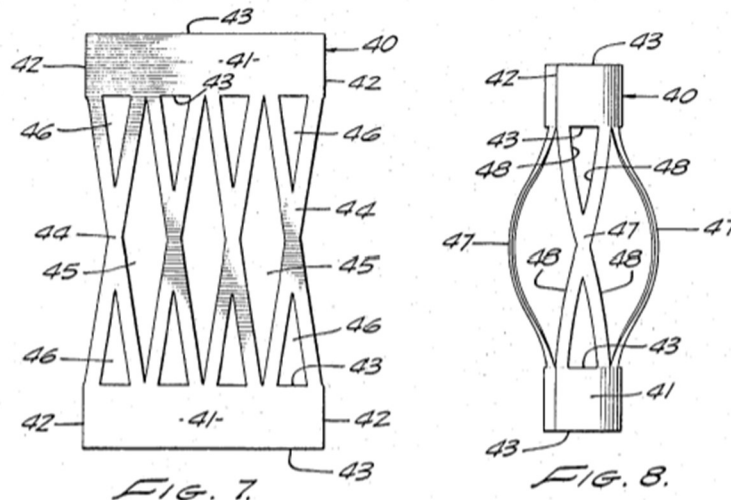


34. PM5, PM6 and PM7 disclose a range of centralisers produced by Downhill Products and trademarked; Expand-O-Lizer Sub, Expand-O-Lizer Extreme Service (ES), and Expand-O-Lizer URS, respectively. It is however noted that each of these products is disclosed in PM5 and the content of PM6 and PM7 do not add anything over PM5. Therefore I do not need to discuss PM6 or PM7 further.

35. Each of the aforementioned products disclosed in PM5 comprise a non-welded, one-piece, centraliser comprising opposing collars and a plurality of bowsprings therebetween. The bowsprings are provided with a generally convex shape having an apex at its radial extent as illustrated in the figures below, which are extracts from PM5, relating to the Expand-O-Lizer Sub, Expand-O-Lizer ES, and Expand-O-Lizer URS, respectively.



36. PM8 relates to a method of manufacturing a centraliser wherein a blank formed of a flat metal sheet is cut to make apertures 45 to form ribs 44 therebetween. The ribs extend between two panels 41. The sheet is then formed into a cylinder which is subsequently compressed to form the ribs into bows 47. The figures below, which are an extract from PM8, show one embodiment of a blank and associated centraliser wherein a gap 46 is provided at either end of the rib.



Novelty – the law

37. The Requester alleges that claims 1-6, 9-11, 12, 27, 28 lack novelty in light of the prior art provided with the request.

Section 1(1)(a) of the Act reads:

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

(a) the invention is new;

38. The relevant provisions in relating to novelty are found in section 2(1) and section 2(2) which read:

An invention shall be taken to be new if it does not form part of the state of the art.

The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way.

Is the Patent novel with respect to the prior art?

39. I have already stated that I will only consider the validity of claim 1 with respect to PM1-PM8 and that, if I find claim 1 to lack novelty over PM1, I will only consider the validity of claims 9-12 with respect to PM1. I have additionally stated that, if I find claim 1 to lack novelty over PM4 or PM5, I will only consider the validity of claim 27 with respect to PM4.

40. The Observer, further to section 2(1) and 2(2) recited above, refers to *SmithKline Beecham Plc's Patent*³ wherein the House of Lords held that there were two requirements for anticipation: prior disclosure and enablement. The Observer further asserts, referring to *General Tire & Rubber Company v Firestone Tyre & Rubber Company Limited*⁴, that the matter relied upon as prior art must disclose subject matter which, if performed, would necessarily result in infringement. The Observer additionally refers to *Dr Reddy's Laboratories (UK) Ltd v Eli Lilly and Co Ltd*⁵, where the Patents Court held that where the skilled person would have recognised that there were errors in a prior disclosure, the question to be considered was whether there was a clear and unambiguous disclosure of the invention, not whether the skilled person would have concluded that the document probably disclosed the invention. These submissions are fundamental to any assessment of novelty and are not contested by the Requester.

41. It is abundantly clear to me, from my consideration of the Patent and the state of the art, that features 1.1, 1.2, 1.4-1.5 and 1.7 are entirely conventional, and necessary, features of all bowspring type centralisers. I note that there is no contention on this matter from the Observer. I do however note that the Observer contends that PM2a and PM2b discloses a centraliser having a bowspring with a flat intermediate portion rather than strictly defining a convex surface as may be

³ SmithKline Beecham Plc's Patent [2006] RPC 10,

⁴ General Tire & Rubber Company v Firestone Tyre & Rubber Company Limited, [1972] RPC 457

⁵ Dr Reddy's Laboratories (UK) Ltd v Eli Lilly and Co Ltd [2008] EWHC 2345 (Pat), [2009] FSR 5,

understood from claim 1 of the Patent. However, the centraliser disclosed in PM2a & PM2b clearly has *generally* convex intermediate portion which includes the flat central section, and this seems sufficient to meet feature 1.7 of the Patent. However, if this is considered to be an unfairly broad interpretation of 1.7 then it is additionally clear that any transition between the flat central section and an inclined end portion would provide two intermediate portions each defining a local convex outer surface either side of the flat portion, each of which would assume a radially outer position and radially inner position in use. Therefore, despite the Observers assertions, PM2a and PM2b both clearly and unambiguously disclose the features of 1.7. Therefore I will direct my attention to those features claimed in 1.3, 1.6, 1.6.1 and 1.8 only.

42. PM1-PM8 all explicitly stipulate that the disclosed centraliser is unitarily formed, see; paragraph [0005] of PM1, paragraph 25 of PM2a, 1:00-1:00 of PM2b, page 10 lines 11-20 of PM3, paragraph [0053] of PM4, pages 34, 36, 37 of PM5 and column 2 lines 59-71 of PM8. Therefore it is irrefutable that the features of 1.3 are not novel with respect to PM1-PM8.

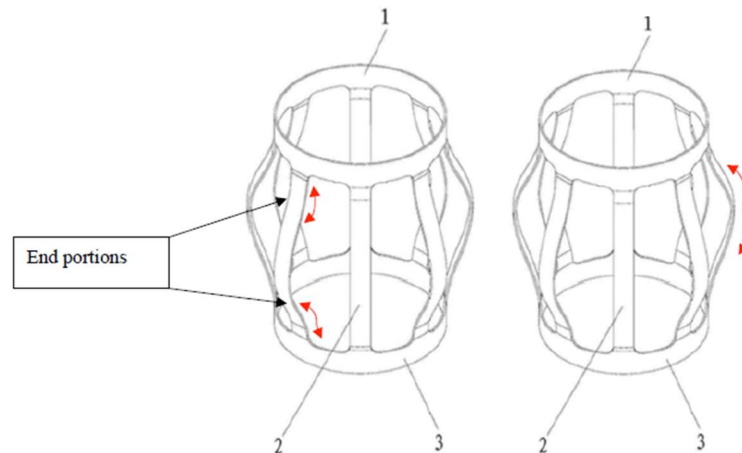
43. Turning to 1.6, I have already acknowledged that each of PM1-PM8 disclose an elastic rib, or bowspring, comprising an elongate profile extending between end collars. The Requester, in respect to PM1, argues that it is implicit that the endpoints of the bowspring are configured to allow the highest point of the arc defined by the convex intermediate portion to move in order for the centraliser of PM1 to be workable. The Requester additionally asserts that PM1 discloses a narrowing of the working ribs at one end which would support this implication. Furthermore, the Requester asserts that the feature of 1.6 is merely a result to be achieved by the features of 1.7 and 1.8 and relies on page 20 lines 24-26 of the Patent, copied below, to confirm their position. The Requester makes a similar argument with respect to PM2 and PM3.

“...the intermediate portion 119 is relatively less flexible than the end portions 121 due to the intermediate portion 119 being relatively more curved (e.g. has a smaller radius of curvature) than the end portions 121.”

44. Referring to PM1, in one embodiment the curved rib has a width that increases between its narrowest proximate the first end ring and its widest proximate the second. The narrowing of the rib is to increase the elasticity of the rib; therefore it follows that any widening of the rib is to decrease the elasticity. Additionally, whilst PM1 teaches that one end portion of the rib would be more flexible than the convex intermediate portion it does not teach that both end portions are more flexible than the convex intermediate portion. PM1 goes further to imply that the wider end portion is indeed stiffer than the intermediate portion which would appear to teach away from the Patent. Furthermore, I do not agree that it is absolutely necessary for the end portions of the bowspring to be configured to permit movement of the intermediate portion in order to make the centraliser of PM1 work; the end portions could be significantly less flexible than the convex intermediate portion and the convex intermediate portion would still deform, in use, if suitably flexible. Therefore it cannot be implied that the intermediate portion of the rib disclosed in PM1 is relatively less flexible than both end portions as required by 1.6.

45. In their auxiliary argument the Requester asserts that the feature of 1.6 is merely a result to be achieved by the features of 1.7 and 1.8, which they argue are

shown in the prior art. The Requester provides the figures below, which the Requester claims clearly shows that the curvature of the concave portion, illustrated on the left-hand side, has a radius that is larger than the radius of the convex portion, illustrated on the right-hand side. A similar argument is made with regard to PM2a, PM2b and PM3.



46. The Observer argues that PM1, and the remaining prior art documents submitted by the Requester, does not show that the end portions have a greater radius of curvature than the intermediate portion. The Observer additionally argues that referring to arbitrary points in a figure does not satisfy the requirements needed to conclude a lack of novelty as set out in *General Tire & Rubber Company v Firestone Tyre & Rubber Company Limited*.

47. I note that there is no explicit disclosure in PM1, or any of the other listed prior art documents, relating to a radius of curvature of a convex portion and a concave portion and although features shown in a drawing may form part of the state of the art when a skilled person could derive technical teaching from them without further description, it is not generally possible to derive a technical teaching by measuring dimensions in the diagrammatic representation as the requester has done in this instance. Therefore, typically, any derived dimension does not form part of the state of the art.

48. The Requester, in their observations in reply, contend that the skilled person would have no difficulty in deriving information from the drawings which I presume includes a relative dimension of a convex and concave portion. The Requester relies on *BL O/653/22*⁶ wherein the Hearing Officer clarified that there is a distinction between: a) reading specific dimensions from a drawing where no such dimensions are given and attempting to use that information to derive a technical teaching, and b) deriving general information from drawings about components and their shape, function etc, and wherein the latter is allowable in principle.

49. In consideration of the distinctions set out in *BL O/653/22* the skilled person would derive certain information from the figures provided in PM1-PM3 including whether or not the bowspring was concave or convex even if no explicit teaching is provided in the respective prior art. However attributing a specific property such as a specific radius of curvature or even a relative radius of curvature would go beyond

⁶ *Zebra Technologies Corporation (BL O/653/22)*

this general teaching. Therefore, none of the figures provided in PM1-PM3 clearly and unambiguously disclose the specific relationship as set out in 1.8. Whether the skilled person, having considered PM1-PM3 would conclude that the figures probably showed a relative curvature as required by 1.8 is a matter of inventive step and therefore beyond the remit of this Opinion.

50. The Requester makes a second auxiliary argument with respect to PM1-PM3 and 1.8, asserting that the disclosed centraliser will *undoubtedly* be deformed as required by 1.8 when inserted into a borehole, on the assumption that a concave end portion would inevitably be more flexible than a convex intermediate portion.

51. However, the only evidence that has been submitted which discloses a centraliser being inserted into a borehole is PM2b. I have already stated that there is no explicit teaching of a relative radius of curvature in any of the provided prior art. Furthermore, only general information may be derived from the video provided by PM2b, which does not extend to deriving a specific radius or even a relative radius. Therefore, even if there is a possibility that the centraliser of any one of PM1-PM3 behaves as required by the 1.8, there is also a possibility that it does not; this will depend on the clearance afforded by an associated borehole as well as the configuration of any debris encountered by the centraliser. Therefore this is a question of inventive step rather than novelty. Therefore, in my opinion, the Patent is novel over PM1-PM3.

52. The Requester provides very little discussion of PM4-PM8 with respect to claim 1, furthermore I am unable to identify any relevant teaching in these document that goes beyond the teachings of PM1-PM3. Therefore, in my opinion, the Patent is novel over PM4-PM8 also.

Opinion

53. It is my opinion that the Patent satisfies Section 1(1)(a) of the Act in light of the prior art provided in the opinion request.

Sean OConnor
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.