

Filed January 7, 2026

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Sandvik Mining and Construction USA LLC,
Petitioner

v.

CMS Cepcor Limited and CMS Cepcor Americas LLC
Patent Owner

IPR2024-01381
US Patent 11,014,090

**FOURTH DECLARATION OF DAVID G. SMITH, IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT 11,014,090**

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I. INTRODUCTION

1. I, David G. Smith, submit this declaration on behalf of CMS Cepcor Limited and CMS Cepcor Americas LLC (hereafter CMS, or Defendants), regarding a Petition for *Inter Partes* Review of U.S. Patent No. 11,014,090 ('090 patent).

2. The subject of my declaration is the invalidity of the '090 patent. This declaration is provided after my review and analysis of the '090 patent, the prior art, relevant background technology, and is also based on my education and experience, as well as additional materials identified herein.

3. This is the fourth declaration I have submitted in this matter. The first declaration addressed the invalidity of all of the original asserted claims of the '090 patent. The second declaration addressed the invalidity of the amended claims as outlined in Patent Owner's Contingent Motion to Amend. The third declaration addressed the invalidity of the further claim amendments outlined in Patent Owner's Revised Contingent Motion to Amend. This declaration addresses comments and arguments made against the analysis presented in my third declaration.

II. BACKGROUND AND QUALIFICATIONS

4. Counsel for CMS Cepcor has retained me as a technical expert in this action. I have attached, as Exhibit 1, a copy of my Curriculum Vitae, which

outlines my educational and employment history. I received a Bachelor's degree in Mechanical Engineering from Brigham Young University - Idaho. I received a Master's of Science degree in Mechanical Engineering from Brigham Young University (BYU), and a Masters of Business Administration from Brigham Young University (BYU) with an emphasis in Product Development. I am a licensed professional engineer (PE) and a certified safety professional in comprehensive practice (CSP).

5. I have experience in the fields of mechanical engineering, structural design, new product development, the design of equipment, machinery, safety and consumer products. In my role as a consultant, I have consulted on numerous products and custom testing devices. Among the products I have consulted on are drill rigs, pipe breakers, brick saws, auger conveyors, belt conveyors, dry bulk trailers, rock slingers, dump trailers and other hydraulic equipment.

6. I am a named inventor on seven U.S. Patents. I believe that my credentials as set forth above and, in my Curriculum Vitae, demonstrate that I am an expert in the fields of mechanical design, structural design, product design, design of equipment, and design safety.

7. I have attached as Exhibit 2 a list of all my deposition or trial testimony in the last four years.

8. I have attached as Exhibit 3 a list of all of the references and materials

I have considered and/or relied on in coming to my opinions in this matter.

III. LEGAL PRINCIPLES

9. I am not a lawyer. Therefore, in formulating my opinions and conclusions in this proceeding, I have been provided with an understanding of the relevant aspects of U.S. patent law that govern the issues of patent validity.

Prior Art

10. I understand that, in this IPR proceeding, the prior art to the '090 patent includes patents and printed publications in the relevant field(s) that predate the patent's effective filing date. I am informed that the priority date for this analysis is November 12, 2013.

Obviousness

11. I understand that a claim of a patent may be obvious to a person of ordinary skill in the art if the differences between the subject matter set forth in the patent claim and the prior art are such that the claimed subject matter as a whole would have been obvious at the time of the invention.

12. I understand that obviousness is a determination of law based on various underlying determinations of fact. In particular, these underlying factual determinations include (1) the scope and content of the prior art; (2) the level of ordinary skill in the art at the time the claimed invention was made; (3) the differences between the claimed invention and the prior art; and (4) the extent of any

proffered objective “indicia” of non-obviousness. I understand that the objective indicia, also known as secondary considerations, which may be considered in such an analysis include, among other factors: the commercial success of the patented invention (including evidence of industry recognition or awards), the existence of a long-felt but unmet need in the field satisfied by the invention, the failure of others to arrive at the invention, industry acquiescence and recognition of the invention, initial skepticism of the invention by others in the field, the extent to which the inventors proceeded in a direction contrary to the accepted wisdom of those of ordinary skill in the art, and licensing of the patent.

13. In determining the scope and content of the prior art, I understand a reference is considered prior art for the obviousness analysis if it falls within the inventors’ field of endeavor. Additionally, a reference is prior art for the obviousness analysis, even if from a different field of endeavor, if it is reasonably pertinent to the particular problem for which the invention was made. A reference is reasonably pertinent if it is something a person of ordinary skill in the art would have looked to when attempting to solve the problem.

14. While multiple prior art references or elements may be combined to render a patent claim obvious, I understand that a patent claim composed of several elements is not proven obvious merely by demonstrating that each of its elements was, independently, known in the prior art. I understand that I should consider

whether there is an “apparent reason” or motivation to combine the prior art references or elements in the way the patent claims. It is my further understanding that the law recognizes several rationales for combining references or modifying a reference to show obviousness of claimed subject matter. Some of these rationales include: combining prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to obtain predictable results; a predictable use of prior art elements according to their established functions; applying a known technique to a known method or product ready for improvement; and choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Analogous Art

15. I understand that art can be used in an obviousness determination only when it is analogous to the claimed invention. Whether a reference in the prior art is analogous is a question of fact.

16. I understand that two criteria are used to determine whether art is from the same field of endeavor: (1) whether the art is from the same field of endeavor, regardless of the problem addressed; and (2) if the reference is not within the field of the inventor’s endeavor, whether it still is reasonably pertinent to the particular problems with which the inventor is involved.

17. I understand that if a reference disclosure has the same purpose as the

claimed invention, the reference relates to the same problem, and that fact supports the use of the reference to determine obviousness. If it is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it.¹

18. It is my understanding that art is not analogous where an inventor considering the problem addressed by the claimed invention would not have been motivated to consider the cited references when making his invention, particularly when none of the references addresses the problem solved by the invention.²

19. It is my understanding that the hypothetical PHOSITA is presumed to have the ability to select and utilize knowledge from other arts that are reasonably pertinent. Thus, teachings of references from an analogous field properly may be combined with those from the specific field of endeavor in which the inventor is working.³

20. I also understand that it is extremely difficult to argue that a particular field is not the relevant art when one uses an expert in that field.⁴

21. I understand that "In a simple mechanical invention a broad spectrum of prior art must be explored and it is reasonable to permit inquiry into other areas

¹ Scientific Plastic Prods., Inc. v. Biotage AB, 766 F.3d 1355, 112 USPQ2d 1226 (Fed. Cir. 2014). ("The analogous art inquiry is a factual one, requiring inquiry into the similarities of the problems and the closeness of the subject matter as viewed by a person of ordinary skill"); In re Clay, 966 F.2d 656, 23 USPQ2d 1058 (Fed. Cir. 1992).

² In re Klein, 647 F.3d 1343, 98 USPQ2d 1991, 1995-96 (Fed. Cir. 2011) (reversing obviousness rejection because all of the prior art relied on by the Board and the Examiner was non-analogous).

³ Cable Elec. Prods. Inv. v. Genmark Inc., 770 F.2d 1015, 226 USPQ 881 (Fed. Cir. 1985)

⁴ Orthopedic Equip. Co. v. United States, 702 F.2d 1005, 217 USPQ 193 (Fed. Cir.1983)

where one of ordinary skill in the art would be aware that similar problems exist."⁵ For example, a patent application that claimed a "hair brush" having a specific bristle configuration. The Board affirmed the examiner's rejection of the claims as being obvious in view of prior art patents disclosing toothbrushes.⁶

22. In another example, a reference in the **clutch art** was held reasonably pertinent to the friction problem faced by the inventor, whose claims were directed to a **braking material**, because brakes and clutches utilize interfacing materials to accomplish their respective purposes.⁷

23. Analogous arts in patent examination refer to fields of invention that are related to the claimed invention, **even if they are not directly within the same classification**. The Manual of Patent Examining Procedure (MPEP) states:

Not only must the art be searched within which the invention claimed is classifiable, but also all analogous arts must be searched regardless of where the claimed invention is classified. (MPEP 904.01(c))

24. In the end, analogous art is simply that which is not too remote to be treated as prior art, and so labeling it merely connotes that it is relevant to a consideration of obviousness under §103.⁸

⁵ *Stevenson v. Int'l Trade Comm.*, 612 F.2d 546, 550, 204 USPQ 276, 280 (CCPA 1979),

⁶ *In re Bigio*, 381 F.3d 1320, 1325-26, 72 USPQ2d 1209, 1211-12 (Fed. Cir. 2004). *Id.* at 1323, 72 USPQ2d at 1210

⁷ *Ex parte Goodyear Tire & Rubber Co.*, 230 USPQ 357 (Bd. Pat. App. & Inter. 1985)

⁸ ¹⁴⁰*In re Sovish*, 769 F.2d 738, 226 USPQ 771 (Fed. Cir. 1985).

IV. THE LEVEL OF ORDINARY SKILL IN THE ART

25. I have been advised by counsel that the Federal Circuit has noted a list of six factors that may be considered when determining the level of ordinary skill in the art. The factors are listed below. I have used the factors in combination with the available information in determining the level of ordinary skill in the art.

- A. The education level of the inventor.
- B. The type of problems encountered in the art.
- C. Prior art solutions to those problems.
- D. The rapidity with which innovations are made.
- E. The sophistication of the technology.
- F. The education level of active workers in the field.

26. Considering the above factors, it is my opinion that at the time of the invention and the Challenged Claims of the '090 patent, a person having ordinary skill in the art would be a person who has a bachelor's degree in mechanical engineering or a related field, and at least 2 years of experience with industrial equipment design and development. A POSITA may also have a combination of more formal education and less work experience or a combination of less/different formal education and more work experience. I use that level of skill in making my observations and reaching my conclusions herein, unless otherwise stated. As a result of my education and experience, I am qualified to testify as a person of

ordinary skill in the art (POSITA) in this case. I further note that Dr. Kytoma, the expert for Patent Owner does not object to this definition.⁹ This is the same level or ordinary skill applied in all four of my declarations in this matter.

V. ANALOGOUS ART IN NEW GROUNDS

27. Section VI of the Fifth Kytomaa Declaration is titled “The New Grounds Rely on Non-Analogous Art.” He then proceeds to discuss why he believes that the US Patent 6,270,026 to Piepho (Exhibit 1016) is not analogous. Even going as far as stating that “no POSITA would consider Piepho as pertinent art.” While the ground is new, the use of Piepho in obviousness grounds is not. Dr. Kytomaa does not appear to have a problem with the use of the new reference (Coxhill) in the ground, but now opines that Piepho is not analogous.

Piepho is not new art

28. As noted above, this is my 4th declaration in this proceeding. The first declaration was submitted in August 2024, well over a year ago. The Piepho reference was used in my original grounds, as well as in the grounds in my second and third declarations. Neither of Kytomaa’s first or second declarations suggested that he did not consider Piepho to be analogous art. It is curious that if Piepho is so clearly and blatantly in another field of art, that such an argument was not raised for over a year after the Piepho reference was introduced. Indeed, as will be

⁹ EX2020- Second Declaration of Harri Kytomaa, PH.D. Pp. 4-5

shown, Piepho is analogous art.

Piepho is in the field of endeavor

29. Dr. Kytomaa appears to argue that the field of endeavor is restricted to gyratory crushers and gyratory crushers only. Dr. Kytomaa argues that Piepho, which relates to a coal pulverizer, is so different from the operation of the gyratory crusher of the '090 patent that they should not be considered to be in the same field.

30. However, in my opinion the proper description of the field of endeavor is main shaft assemblies for rock crushers. Both the '090 Patent and Piepho are related to main shaft assemblies for rock crushers. The '090 patent is titled Gyratory Crusher Main Shaft and Assembly and Piepho is titled Strain Relief Main Shaft Assembly.

31. Undoubtedly, both the '090 and Piepho are rock crushers. Dr. Kytomaa agreed that coal is a specific kind of rock.¹⁰ He acknowledges that the purpose of the coal crusher references in Piepho is to reduce the size of coal from .075- 1" diameter rocks to a 0.003-0.012 inch rock powder.¹¹

32. However, both the '090 Patent and Piepho address the same problems, one of which is preserving the main shaft (preventing it from needing to be

¹⁰ 2nd Kytomaa Deposition Pg. 7

¹¹ Fifth Kytomaa Declaration Pg. 10

replaced), which is expensive as well as difficult and time consuming to remove. Piepho states that “Pulverizer vibration usually results in high shaft stress levels and may have a role in main shaft failure.”¹² And continues that “Because of the foregoing, there have been many attempts to correct main shaft failure frequency.”¹³ The second problem, related to the first, is how to minimize the down time, and thus the opportunity cost of not running the rock crushing machines. The ’090 patent addresses these problems by using a wear sleeve on the shaft, which can be replaced when worn out. Replacing the wear sleeve is less expensive, easier and faster than replacing the entire main shaft. The main shaft and sleeve are also formed with a tapered interference fit to further increase the speed with which the wear sleeve can be replaced. Piepho, addresses the problem by use of a coating for the shaft that reduces fretting, stress, fatigue and ultimately the failure of the main shaft. Fewer main shaft failures, means fewer main shafts need to be replaced. Piepho further teaches that “another aspect of the present invention is to provide an improved main shaft that is simple in design, rugged in construction and economical to manufacture.”¹⁴ A POSITA would recognize that a design that is economical to manufacture would include assembly time. Further, a POSTIA would recognize that fretting, is also a consideration for the design of the

¹² Piepho 1:60-62

¹³ Piepho 1:66-67

¹⁴ Piepho 2:29-31

shaft and wear sleeve of the '090 patent. The main shaft of Piepho on which the coating is applied, can be cylindrical but Piepho points out that it is preferably tapered with a tapered bearing interference fit on the end.

33. While it is true that the invention of Piepho is not the tapered interference fit on the end of the main shaft, Piepho does teach and show that, not only were tapered interference fits between shafts and bushings/wear sleeves known, they were in fact preferable. That is, Piepho highlights what was already well known in the art – that tapered shafts with tapered bushings/wear sleeves were known and preferable. In my first and third declarations I highlighted multiple patents and prior art examples that show tapered shafts with tapered interference fit bushings. I have listed them again, below, for convenience. Further, Dr. Kytomaa agreed that tapered friction fit shafts and sleeves were known in the comminution field (rock crushing field) as well as generally in the mechanical arts.¹⁵

- US 4,019,344
- US 3,343,376
- US 2,840,399
- US 3,228,102
- US 4,829,718
- SAE J755

¹⁵ 2nd Kytomaa Deposition Pp. 19-20

- SAE J1419
- ASME B18.8.2
- Machine Design Data Handbook, K. Lingaiah, c1994
- <https://www.cgtek.co.uk/metalwork/data/morse>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3779551/>
- https://web.archive.org/web/20101027092713/https://pbase.com/mainecruising/fitting_a_prop
- <https://surpluscenter.com/2-32-cu-in-hyd-clutch-pump-only-9510-390-139/>
- https://img.directindustry.com/images_di/photo-g/20030-2339083.jpg
- https://www.brandnewengines.com/cdn/shop/products/SAM_3681_1024x.jpg
- <https://ashdowntooling.co.uk/products/1-5mm-13mm-lathe-tailstock-drill-chuck-morse-taper-3-mt3-to-b16-arbor>

34. Both sides are in agreement that a POSITA would be aware of tapered shafts with tapered interference fit bushings both generally in the mechanical arts, as well as in the specific field of rock crushing equipment. A POSITA would also be aware that tapered shafts are preferable (as taught by Piepho) as they improve the ease of removal and prevent damage to the shaft,¹⁶ they are able to be used in more locations as they do not require presses and gear pullers,¹⁷ and they make removing components on a tapered shaft particularly easy,¹⁸ particularly when

¹⁶ Behm 1:13-15, 1:35-42

¹⁷ Sillett 1:15-24

¹⁸ Harless 3:15-22

combined with known hydraulic systems for making and breaking the interference fit. Piepho teaches that a tapered shaft and bushing are preferable, and a POSITA would recognize that it is preferable for at least the above reasons. All of these known benefits directly relate to the problem of reducing down time of rock crushing machinery. Piepho and the '090 Patent are directed to solving the same problems and are analogous art.

35. Further, it is well known that rock crushing and pulverizing is a multi-stage process. There are primary crushers, of which a gyratory crusher may be one, and there can be secondary and tertiary crushers or pulverizers that are used, of which the pulverizer referenced in Piepho would be one.

36. Dr. Kytomaa testified that “depending on the mining operation, you’ll start with a broad range of sizes, and there may be sort of a, let’s say, a coarse size classification that allows smaller components to – let’s say, smaller pieces of rock to move on, and larger ones may get crushed by some kind of crusher that accommodates large rocks.”¹⁹

37. Dr. Kytomaa continued to testify that “ultimately, the coal has to be reduced in size small enough for the pulverizer to accept... So there will be multiple steps, typically two or three, that also includes a classification of size. So larger rocks will need to be crushed by a different kind of equipment than the

¹⁹ 2nd Kytomaa Deposition Pg. 26

smaller rocks, and the classification will direct different sizes to different pieces of equipment.”²⁰

38. In the Fifth Kytomaa Declaration, Dr. Kytomaa explains that the “Sandvick CH440 cone crusher accepts rocks up to 9.8 inches wide and has an adjustable output size of 0.3 to 1.8 inches.”²¹ Not uncommon for a primary crusher. Dr. Kytomaa further explains that the input for the coal pulverizer “should ideally be 0.75 to 1 inch.”²² It follows that the output from the gyratory cone crusher could be appropriately sized to be fed into the coal pulverizer.

39. While primary crushers may have different designs and operate differently than other crushers in the stream of production (Dr. Kytomaa highlights these differences in his Fifth Declaration), a POSITA to be aware of and understand the different machines, the different types of crushers that are used at different stages of processing rocks and coal, and be able to incorporate teachings, designs and principles from one type of crusher into another crusher. This is true even if there are differences in how the crushers operate, how the crushers are loaded, if the wear environment is different and how often and in what ways the different crushers are assembled and disassembled. Thus, Piepho and the ’090 can be used sequentially while processing coal and are in the same field of endeavor.

²⁰ 2nd Kytomaa Deposition Pp. 26-27

²¹ Fifth Kytomaa Declaration Pg. 10

²² Fifth Kytomaa Declaration Pg. 10

Even if the field of endeavor is defined so narrowly as to only include main shafts for gyratory rock crushers, and reducing down time due to maintenance on the main shaft, art that deals with reducing down time due to maintenance for main shafts for other types of crushers including pulverizers, are at the very least reasonably pertinent.

Piepho has same patent classification as the '090 Patent

40. It is my understanding that the USPTO uses the cooperative patent classification (CPC) system for organizing patents and other technical documents into specific technology groupings based on common subject matter. The classification system has a main section, the broadest category, identified by a single letter. There is then a class of the main section identified by two digits. They are then broken down into subclasses identified by one letter. And finally, into sub groups identifying the most specific levels that identify particular technical features.

41. Both the '090 patent and Piepho have the same section, class, and subclass CPC identifier as **B02C** which represents CRUSHING, PULVERIZING OR DISINTEGRATING IN GENERAL.

42. While the most specific sub groups which identify the most specific levels are different, the same main classification supports that Piepho and the '090 patent are in the same field of endeavor.

Patent Owner's expert is experienced in field of coal pulverizers

43. I understand that it is extremely difficult to argue that a particular field is not the relevant art when one uses an expert in that field.²³

44. Patent Owner's Expert, Dr. Hari Kytomaa, explained in his relevant experience in his first deposition, stating: "specifically, I have worked on coal pulverizers and b[all] mills, as well as a crusher. These were in the context of two or three projects that I worked that were associated with coal mines and coal fired power plants."²⁴ Dr. Kytomaa did not testify that he had direct experience with gyratory crushers.

45. As Dr. Kytomaa was likely selected as an expert due to his experience with coal pulverizers in the context of coal fired power plants, it is difficult for Patent Owner to now argue that Piepho, which teaches a main shaft for a coal pulverizer, is not analogous or relevant art.

File History Does Not Overcome Obviousness

46. Dr. Kytomaa notes that "during prosecution, the Examiner cited Torrence and applied Coxhill '800 (Ex. 1039)... Yet she allowed the (broader) issued claims over them. This indicates to me that the Examiner viewed Torrence as deficient. Petitioner is simply recycling considered art and arguments."²⁵

²³ Orthopedic Equip. Co. v. United States, 702 F.2d 1005, 217 USPQ 193 (Fed. Cir. 1983)

²⁴ 1st Kytomaa Deposition Pg. 5

²⁵ Third Kytomaa Declaration Pg. 28

However, in my obviousness grounds, Coxhill is combined with Piepho. Piepho (nor any of the other tapered shaft and tapered sleeve references) was not before the examiner. Thus, the arguments are clearly different. Not only is the art cited different, the claims themselves have been amended twice. Thus, neither the claims nor the combinations of art that show them obvious were before the examiner during the original prosecution, and the examiners conclusions related to a different analysis. These are not recycled arguments.

VI. MOTIVATIONS TO COMBINE

47. Dr. Kytomaa notes that when an invention is directed to a different purpose, the inventor would accordingly have less motivation or occasion to consider it in an obviousness analysis. However, Piepho similar to the '090 is directed to increasing the life of the main shaft of a rock crusher, and would lend itself to consideration in solving that problem. Further, Piepho teaches that a tapered shaft is preferable, and a POSITA would understand that the tapered shaft is preferable because it makes it easier and faster to replace a bushing, with less damage to the main shaft. For that reason, Piepho also lends itself to consideration and solving the problem addressed by the '090 patent. Yagi is directed to using hydraulics to seat and unseat bushings on tapered shafts, and lends itself to consideration in solving the problem addressed by the '090 patent.

48. It is my understanding that "motivation to combine may be found

explicitly or implicitly in market forces; design incentives; the ‘interrelated teachings of multiple patents’; ‘any need or problem known in the field of endeavor at the time of invention and addressed by the patent’; and the background knowledge, creativity, and common sense of the person of ordinary skill.”²⁶

A POSITA trying to increase the life of a main shaft, and/or reduce down time when performing maintenance on a main shaft assembly would be motivated to combine the straight shaft and wear sleeve of Torrence with the preferable tapered shaft and tapered sleeve of Piepho as tapered shafts improve the ease of removal and prevent damage to the shaft,²⁷ they are able to be used in more locations as they do not require presses and gear pullers,²⁸ and they make removing components on a tapered shaft particularly easy,²⁹ particularly when combined with known hydraulic systems for making and breaking the interference fit.

49. Dr. Kytomaa argues that cutting grooves into the Coxhill shaft could increase the risk of catastrophic failure. However, it is well within the ordinary skill of a POSITA to analyze and design the main shaft of a crusher to have sufficient strength even with a groove cut into the shaft. Indeed, shafts with grooves have been used in multiple scenarios as shown in the prior art including:

²⁶ <https://www.bitlaw.com/source/mpep/2143-01.html>

²⁷ Behm 1:13-15, 1:35-42

²⁸ Sillett 1:15-24

²⁹ Harless 3:15-22

- US 8,302,754 to Yagi
- US 4,019,344 to Calistrat
- US 2,840,399 to C.A. Harless
- US 4,829,718 to Behm

50. Further, Dr. Kytomaa notes that Polinski criticizes the shaft design of Coxhill. Polinski issued in 1983, and Coxhill issued in 1977. In the years between 1983 and 2010, there were significant improvements in analysis technology, specifically in Finite Element Analysis (FEA) software. While companies such as NASA used FEA in the 1970's it wasn't until after the 1990's that low-cost powerful personal computer (PC) workstations emerged and FEA was adopted in small and medium sized businesses.³⁰ By the 2000's when I pursued a bachelors degree, FEA was being taught in mechanical engineering coursework. Such software and tools enable a POSTIA, at least as of 2010, to successfully design grooves in shafts while taking into account cyclical bending loads, stress concentrations and fatigue loads. Dr. Kytomaa's analysis of what a POSITA would know and be capable of is outdated and inaccurate.

VII. OIL PATH OF CLAIMS 16 AND 24

51. Dr. Kytomaa argues that claims 16 and 24 are not obvious because the

³⁰ <https://www.fea-academy.com/index.php/component/content/article/27-blog/fea-generalities/73-fem-history?Itemid=101>

precise oil path specified in the claim is not taught in Yagi. However, based on the disclosures of Yagi, it is my opinion that the precise oil path described in claims 16 and 24 are not novel, rather an obvious modification of what is taught in Yagi, and is well within the ordinary skill of a POSITA.

52. Yagi teaches multiple possible oil paths. For example, Yagi teaches:

- An oil path starting at the end of a shaft and extending to a single groove (Fig. 3)
- An oil path starting at the end of a shaft extending to a near groove and a far groove (Fig. 4)
- An oil path starting at the end of the shaft extending to a far groove and then continuing back to the near groove via an external groove in the tapered shaft (Fig. 5).
- An oil path starting at the end of the shaft and extending to the far groove. (Fig. 6).

53. The only option for feeding oil to two grooves not disclosed in Yagi is to feed oil to a near groove and then have it extend to the second groove via a longitudinal groove on the external surface of the shaft. This is the path claimed in the '090 patent. Dr. Kytomaa argues that there are additional benefits of the oil path described in claims 16 and 24, however, these benefits are not described in the patent and would just as apparent (and motivating) to a POSITA as they are to Dr. Kytomaa. This supports obviousness as opposed to supporting novelty as Dr. Kytomaa suggests. As I noted in my third declaration, at the very least, the path

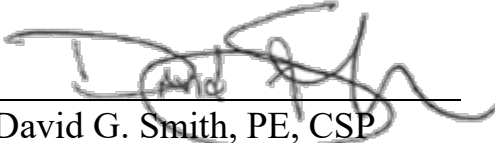
claimed in the '090 would be obvious to try as it is one of a specific number of options for feeding two grooves. There is also a motivation to feed oil internally to the near groove as the internal oil passage does not need to be as long and is therefore easier and less expensive to drill.

VIII. CONCLUSION

54. For these reasons, and the reasons described in my third declaration, it is my opinion that Piepho is analogous art to the '090 Patent and the amended claims of the '090 patent would have been obvious to a person of ordinary skill in the art as all of the elements are taught in the art and there are sufficient motivations to combine references.

55. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed on January 7, 2026 in Meridian, ID.



David G. Smith, PE, CSP