

Exhibit B

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

ARMATURENFABRIK FRANZ
SCHNEIDER GMBH + CO. KG,

Plaintiff,

v.

RJ MACHINE COMPANY, INC.,

Defendant.

Case No. 6:23-cv-00680-AM-DTG

**DECLARATION OF DR. JOHN P. RODGERS IN SUPPORT OF RJ MACHINE
COMPANY, INC.'S OPENING CLAIM CONSTRUCTION BRIEF**

I. INTRODUCTION

I, Dr. John P. Rodgers, declare as follows:

1. I am over the age of 18 years and am fully competent to make this Declaration. I make the following statements based on personal knowledge and, if called to testify to them, could and would do so.

2. I have been retained on behalf of RJ Machine Company, Inc. ("RJ Machine"). I have been asked to study and provide my opinions on claim construction concerning U.S. Patent No. 9,851,030 ("the '030 Patent"). The opinions I offer here are made in view of the patent itself, certain prior-art references, the state of the art at the time of the alleged inventions, and the knowledge that a person of ordinary skill in the art would have had at that time.

3. My opinions and views set forth in this Declaration are based on my education, training, and experience in the field of mechanical engineering, pressure testing and measurement equipment used in oilfields, and related technical areas, as well as other materials that are cited and discussed herein.

II. BACKGROUND & QUALIFICATIONS

4. My curriculum vitae (“vitae”), which includes a summary of my background, experience, publications, and expert-witness experience is included below as Appendix A.

5. I am the President and Founder of Starboard Innovations, LLC an engineering consulting firm specializing in concept development, new technology research, design, analysis, prototyping and testing in the areas of fluid mechanics, mechanical testing, mechanical analysis, finite element analysis (FEA), mechanical engineering, downhole tools and failure analysis. I have been consulting on a wide range of oilfield projects over the past 20 years involving the equipment and operations related to oil well completions, both downhole and at the surface, and including failure investigations and new technology development. Much of this work has involved instrumentation and sensing used in the field, on test wells, or in test labs. My work includes working with high-pressure tubing and piping, pressure vessels, an array of different varieties of pressure measuring devices, and data recording equipment. I have often specified the instrumentation, particularly pressure transducers, used in both downhole tool designs and in test equipment. I have frequently worked directly with pipe fitters and other mechanical and electrical technicians in the installation of piping and tubing, including pressure transducers, for use in test wells and test facilities, particularly at Halliburton Energy Services at locations in Texas and Oklahoma. The test facilities include test wells, surface flow loops, and pressure vessels that simulate downhole operating temperatures and pressures. The pipe and tubing connections are utilized to connect pumps, valves, instrumentation, accumulators, manifolds, and other equipment to the test well, flow loop, or pressure vessel.

6. Prior to founding Starboard Innovations LLC, I was a senior engineer for Mide Technology Corporation where I was active in technology, product and business development.

As part of my work, I served as the principal investigator for an Air Force-funded research program to develop advance rotor concepts and served as team lead for the Bell Helicopter Dynamically-Tailored Airframe Structures program.

7. Prior to my work at Mide Technology Corporation, I worked as a research assistant at the MIT Active Materials and Structures Laboratory, the MIT Space Engineering Research Center and the Duke University Department of Mechanical Engineering.

8. I have a Ph. D. in Aeronautics and Astronautics in the field of structural dynamics which I earned in 1999. I also hold a B.S.E. degree in Mechanical Engineering and Materials Science which I earned in 1992.

9. I am a Licensed Professional Engineer (PE) in mechanical engineering in Texas, North Dakota, and Connecticut. I am also a Professional Engineer License review instructor for the American Society of Mechanical Engineers. I am also a member of the Society for Petroleum Engineers.

10. I have served as a guest lecturer at Texas Christian University and the University of North Texas.

11. I have authored and published numerous publications in my field as detailed in my curriculum vitae attached as Appendix A.

12. I am a named inventor on 37 U.S. Patents.

13. I am an engineer by training and profession. The opinions I express in this Declaration involve the application of my engineering knowledge, expertise, and experience to the evaluation of the '030 Patent.

14. I have previously testified as an expert witness. A list of those matters is attached to this Declaration as part of Appendix A.

15. I am being compensated for services provided in this matter at a rate of \$400 per hour. I am also being reimbursed for any reasonable expenses, such as travel expenses. My compensation is not contingent on my opinions, on the outcome of any aspects of this matter, or on any of the technical positions that I explain in this Declaration.

16. I have no financial interest in RJ Machine, Armaturenfabrik Franz Schneider GMBH + CO. KG (“AS-Schneider”), or the ’030 Patent.

III. MATERIAL CONSIDERED

17. The opinions set forth in this Declaration are my own. My opinions are based on my review of materials provided in this matter as itemized in the chart below, in addition to those cited throughout this Declaration; the Appendices; my educational background as a mechanical engineer, and my experience working in the oilfield with pressure testing and measurement. I also rely on my experience as a technical consultant in other litigation involving related technology.

18. My analysis of the materials relating to this matter is ongoing, and I will continue to review any new material that is provided to me. This Declaration represents certain opinions that I have formed to date and the bases for those opinions. I reserve the right to revise, supplement, and/or amend my opinions based on new information presented to me and on my continuing analysis of the materials cited throughout this Declaration and those identified below.

Description
U.S. Patent No. 9,851,030 (Ex. A)
Prosecution File History, U.S. Patent No. 9,851,030
Original Complaint served on September 20, 2023
Merriam Webster’s definition of “behind” (Ex. C)
Merriam Webster’s definition of “oblique” (Ex. D)
Math-dictionary.com’s definition of “oblique” (Ex. E)
Merriam Webster’s definition of “encompass” (Ex. F)
Southwest Research Institute publication entitled “Orifice Flow Meter Calibration”

IV. SUMMARY OF OPINIONS

19. To prepare this Declaration, I have reviewed and considered the '030 Patent and the prosecution history of the '030 Patent. Additionally, I have considered my knowledge and relevant direct experience in the industry at the time of the '030 Patent's priority date. I am also aware of information generally available to, and relied upon by, a person of ordinary skill in the art ("POSITA") in the relevant time frame.

20. It is my opinion that the following claim terms would have been understood by a POSITA at the time of the alleged invention as follows:

Disputed Claim Term	Understanding of a POSITA
the connecting unit is designed as a nut unit with a female thread and an inwardly pointing inner flange which is arranged in the lower edge region,” (claim 1)	Indefinite
“the outwardly pointing outer flange of the first connecting device fits behind the inner flange of the nut unit” (claim 1)	Indefinite
“...by means of the inner flange and the outer flange the end-face sealing surfaces are clamped together with sealing effect,” (claim 1)	Subject to 35 U.S.C. §112(f) (means-plus function) <u>Function</u>: the first connecting device and the second connecting device are sealed together. <u>Structure</u>: an outer flange and an inner flange clamped together by female threads of a nut engaging male threads of the second connecting device such that end-face sealing surface 43 clamps to end-face sealing surface 33 to create a seal, as shown in Fig 1.
a longitudinal axis of which extends obliquely to a longitudinal axis of the apparatus,” (claim 1)	Indefinite
“the outer flange and the inner flange are provided in an encompassing manner on the first connecting device or on the nut unit,” (claim 1)	Indefinite
“sealing means are arranged between the end-face sealing surface of the first connecting device and the end-face sealing surface of the second connecting device” (claim 1)	Subject to 35 U.S.C. §112(f) (means-plus function) <u>Function</u>: a seal is created between the end-face sealing surface of the first connecting device and the end-face sealing surface of the second connecting device. <u>Structure</u>: O-rings consisting of sealing plastic such as PTFE, elastomer or graphite that are arranged inside a groove; an end-face coating made of sealing material; or a face-turned surface on the first connecting device and a projecting nose unit on the second connecting device.

V. SUMMARY OF THE LAW

A. Person of Skill in the Art (“POSITA”)

21. I understand that a POSITA is not an actual, specific individual; rather, a POSITA is a hypothetical person who is presumed to have knowledge of all prior art in the relevant art at the time of the invention.

22. I also understand that the factors considered in determining the level of skill of a POSITA include: (i) the levels of education and experience of persons working in the field; (ii) the types of problems encountered in the field; (iii) prior-art solutions to those problems; and (iv) the sophistication of the relevant technology.

23. I have been asked to provide my opinions regarding the knowledge and understanding that a POSITA would have had as of the effective filing date of the '030 Patent, i.e., April 23, 2014. Accordingly, the analysis set forth herein is based on the timeframe of the alleged invention as of April 23, 2014.

24. The specification of the '030 Patent describes its field as a connecting apparatus for creating a sealing connection between a measuring instrument or a valve block/valve with a measuring instrument and a metering orifice device installed in a pipeline. *See* Ex. A at 1:12-24. It is my opinion that a POSITA would have understood the field of art to be the field of pipe fitting connections, which would include connecting devices for sealably connecting piping components of a measuring instrument, valve block, or gas pipeline.

25. It is my opinion, based on reviewing the '030 Patent, that as of the effective filing date, a POSITA would have had at least a trade school certificate in pipe fitting or equivalent training and experience, or a certificate in plumbing. Alternatively, a POSITA could have a mechanical or petroleum engineering degree.

26. I note that as of the effective filing date I qualified for or exceeded the level of ordinary skill required by the above definition. I am thus in a position to opine on the capabilities of and the understanding that a POSITA would have had as of the effective filing date of the '030 Patent. My qualification to do so is based, at least in part, on my education and experience working in oilfield pipeline pressure testing and instrumentation, including connections for sealably connecting piping components of the associated measuring instruments, valve block, or pipeline, on my studying of engineering as a graduate student at the Massachusetts Institute of Technology (MIT) for six years, and my studies as an undergraduate at Duke University in the Department of Mechanical Engineering and Material Science for over three years. When I address the understanding of a POSITA, I am referring to the understanding that such a person would have had as of the filing date of the '030 Patent, whether or not specifically stated.

B. Claim Construction

27. I understand that the claims of a patent define the limits of the patentee's exclusive rights. To determine the scope of the claimed invention, courts typically construe (or define) claim terms. I understand that claim construction begins with a focus on the words of the claims themselves as they would have been understood by a POSITA at the time of invention. I understand that, absent some reason to the contrary, claim terms are generally given their plain and ordinary meaning as would have been understood by a POSITA at the time of the invention. The opinions that I offer below are rendered from this perspective.

28. I understand claims in a patent must be construed in light of and consistent with the patent's intrinsic evidence. Intrinsic evidence includes the claims themselves, the written disclosure in the specification, and the patent's prosecution history, including the prior art that was considered by the United States Patent and Trademark Office ("USPTO") during prosecution.

29. I understand that the language of the claims helps guide the construction of claim terms, and that the context in which a term is used in the claims can be highly instructive.

30. I understand that the specification of the patent is one of the best guides to the meaning of a disputed claim term. Embodiments disclosed in the specification help teach and enable those of skill in the art to make and use the invention and are helpful in understanding the meaning of claim terms. Nevertheless, in most cases, preferred embodiments and examples appearing in the specification should not be read into the claims.

31. In the specification, a patentee may also specifically define terms, give a claim term a different meaning than it would otherwise possess, or disclaim or disavow the scope of a claim. A claim term is generally presumed to possess its plain and ordinary meaning. This presumption, however, does not arise when the patentee acts as a lexicographer by explicitly defining or redefining a claim term. This presumption can also be overcome by statements, in the specification or prosecution history of the patent, of clear disclaimer or disavowal of a particular claim scope.

32. I understand that the specification may also resolve any ambiguity where the plain and ordinary meaning of a claim term lacks sufficient clarity to permit the scope of the claim to be ascertained from the claim words alone.

33. I understand that the prosecution history is another important source of evidence in the claim construction analysis. The prosecution history is the record of the proceedings before the USPTO, including communications between the patentee and the USPTO regarding the patent application. I understand that the prosecution history can inform the meaning of the claim language by demonstrating how the patentee and the USPTO understood the invention and whether the patentee limited the invention in the course of prosecution, making the claim scope

narrower than it would otherwise be. I understand that a patentee may also define a term during the prosecution of the patent. I understand that the patentee is precluded from recapturing through claim construction specific meanings or claim scope clearly and unambiguously disclaimed or disavowed during prosecution.

34. I understand that extrinsic evidence may also be considered to help establish the meaning of a claim to a POSITA. Extrinsic evidence is any evidence that is extrinsic to the patent itself and its prosecution history. Examples of extrinsic evidence include dictionary dictionaries, treatises, expert testimony, and inventor testimony. I understand that extrinsic evidence cannot be used to contradict the intrinsic evidence.

35. I further understand that extrinsic evidence is generally used to provide background on the technology, explain the invention, ensure that the Court's understanding of the technical aspects of the patent is consistent with that of a POSITA, or to establish the meaning of a particular claim term in a particular field. I understand that extrinsic evidence is less significant than the intrinsic record in determining the meaning of claim language.

36. I understand that two claims in the same patent will not have the same scope or meaning. This is known as claim differentiation. I understand an independent claim is broader than a dependent claim.

37. I understand for a claim term to have antecedent basis support, an indefinite article (for instance, 'a' or 'an') must precede the claim term the first time it is used in the claims. I also understand that subsequent references to that term in the claims must be preceded by a definite article (for instance, 'the' or 'said').

C. Indefiniteness

38. I understand that an issued patent is presumed to be valid. I also understand, however,

that an issued patent may be found invalid if it fails to comply with the statutory requirements for the specification and claims under 35 U.S.C. § 112.

39. I understand that 35 U.S.C. § 112(b) requires that the specification “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter” that the inventor regards as his or her invention. I understand that the requirement of this provision is commonly called the “definiteness” requirement.

40. I understand that definiteness is to be evaluated from the perspective of a POSITA, and that definiteness is measured from the viewpoint of a POSITA at the time of the effective filing date of the patent’s application.

41. I understand that, in assessing definiteness, claims are to be read in light of the patent’s claims, specification, and prosecution history.

42. I understand that the definiteness requirement requires that a patent’s claim term, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty. Failing to do so results in the term being indefinite.

43. I understand that the purpose of the definiteness requirement is to make sure that the claims of the patent adequately perform their function of notifying the public of the scope of the patent, and of the patentee’s right to exclude. For example, if a competitor attempting to design around the claims of a patent would be unable to discern the metes and bounds of the claimed invention, the claim would be indefinite.

D. Means-Plus-Function

44. I understand that where a claim limitation is expressed in “means-plus function” language and does not recite definite structure in support of its function, the claim limitation is

subject to 35 U.S.C. §112(f). I understand that §112(f) requires such a claim limitation to be construed to cover the structure described in the specification and equivalents thereof that corresponds to means (function) recited in the claim limitation.

45. I understand that if a claim recites the word “means,” there is a rebuttable presumption that §112(f) applies.

46. I understand courts must perform two steps when construing a means-plus function limitation: (1) identify the claimed function and (2) determine what structure, if any, disclosed in the patent specification corresponds to that claimed function.

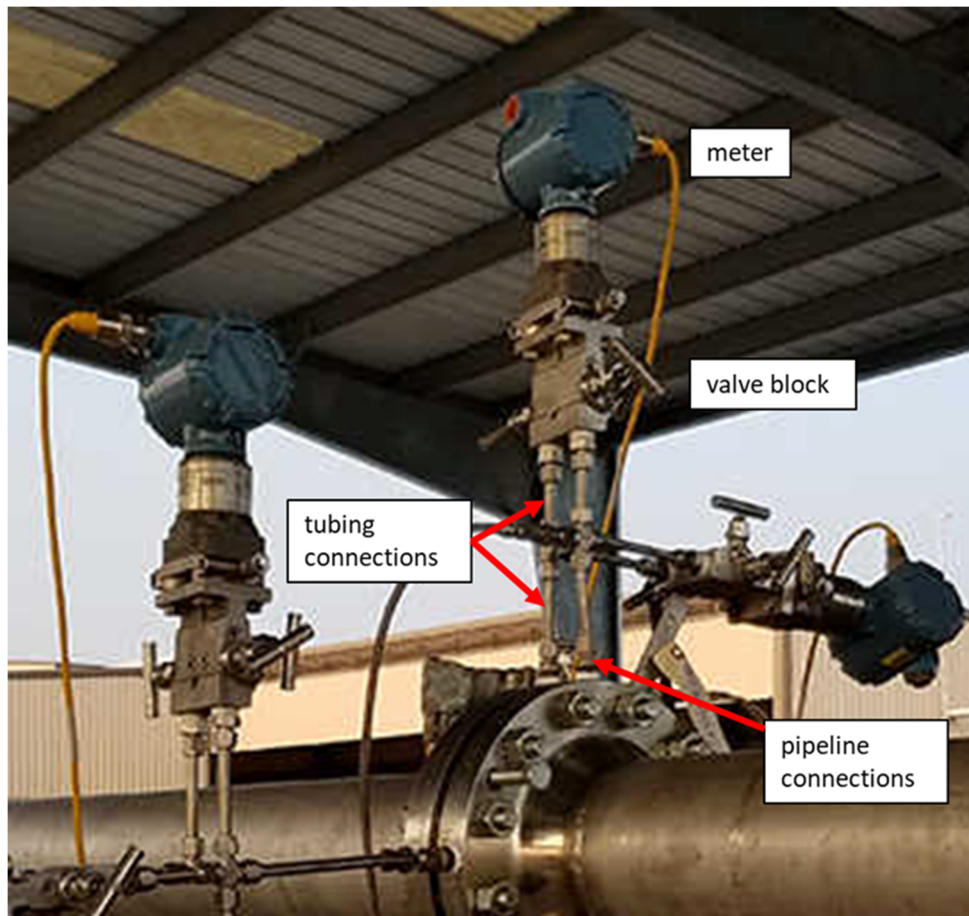
47. I understand a structure corresponds to the claimed function only if the specification and prosecution history clearly links or associates that structure to the function recited in the claim. I also understand it is not enough that the structure can perform the recited function.

V. BACKGROUND AND THE '030 PATENT

48. Gas pipelines were and are widely used to transport natural gas and other gas products. Such pipelines are used to move gas from the source well where it is produced to processing facilities and then on to consumers. It is necessary to monitor the flow rate of the gas within the pipeline to know the amount of gas passing through it. One common technique for determining the gas flow rate is based on taking and comparing two pressure measurements, one upstream and one downstream of a restriction placed in the pipeline. The two pressures are compared to calculate a differential pressure, and that pressure is calibrated to provide an indication of the flow rate. An orifice plate is commonly used to provide a specific flow restriction that can be installed in a flanged connection made within a straight section of the pipeline. A pressure tap on either side of the plate provides the access points for the differential pressure measurement. The two pressure taps must be connected to a measuring device to

determine the differential pressure and flow rate. The connections are made using either pipe or tubing between the taps on the pipeline and the measuring device.

49. The annotated photo below of the SWRI system provides an example of such a pipeline monitoring system. *See Appendix B at pg. 1.* Two pressure taps, one located on each side of a bolted flange connection in the pipeline, are connected to a valve block and differential pressure flow meter via tubing.



Annotated figure of SWRI (Appendix B)

50. It is also desirable to provide one or more valves in between the pipeline and the meter, within the process connections, as in the example above. One type of valve is a shutoff valve that is installed as a singular component in each process line that can be opened or closed to either allow communication or to close and seal off the pipeline. Another type of valve is a

valve block which integrates multiple valves into one component. The valve blocks serve multiple functions including shutoff of each process line, opening cross-communication between the process line, and bleeding or relieving pressure from each line.

51. The '030 Patent describes connecting apparatus 10 for connecting a pressure measuring instrument to a pipeline, such as a natural gas pipeline. Ex. A, Abstract and 1:28-31. The pressure measuring instrument is used to check the flow rate during operation of the pipeline. *Id.*

52. As seen in Fig. 3 (reproduced below), connecting device 10 has three main components: first or lower connecting device 30 (**green**), second or upper connecting device 40 (**lime green**), and connecting unit 50/nut unit 51 (**blue**) (hereafter “nut”)¹. *Id.* at Fig. 3 (color annotations added).

¹ In the '030 Patent specification and claims, connecting unit 50 is defined as a nut unit 51. *See e.g.* Ex. A, 6:55-58 (“connecting unit is designed as a nut unit”); *see also id.* at 7:21, 7:41.

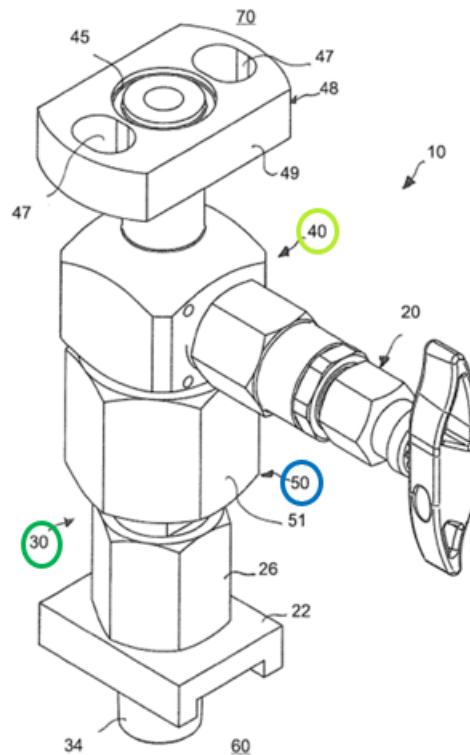


Fig. 3

53. First connecting device 30 (**green**) and second connecting device 40 (**lime green**) are coupled together by rotation of nut 50 (**blue**) during assembly of connecting apparatus 10. *Id.* at 4:51-55, 6:61-7:3. Nut 50 allows the installer to assemble pressure measuring instrument 14 with pipeline 16 solely by rotation of nut 50 and not connecting devices 30, 40. *Id.* at col. 2, lines 55-67.

54. As seen in Fig. 6 (reproduced below), first connecting device 30 is installed between pipeline 16 and measuring instrument 14. *Id.* at Fig. 6, 5:12-46. Referring to both Fig. 3 above and Fig. 6 below, connecting device 30 (**green**) is loosely connected to upper connecting device 40 (**lime green**) via nut 50 (**blue**) before installation. *Id.* at Figs. 3 & 6, 7:4-36. This loose connection provides give between the upper and lower ends, making it easier to install connecting apparatus 10. *Id.*; *see also id.* at 7:50-57. First connecting device 30 (**green**)

connects to pipeline 16, and specifically to the pipeline's metering orifice device 18, and second connecting device 40 connects to pressure measuring instrument 14 via the instrument's valve block 12. *Id.* at 5:12-46, 6:5-8. A metering orifice device is used to measure flow rate through a pipeline.

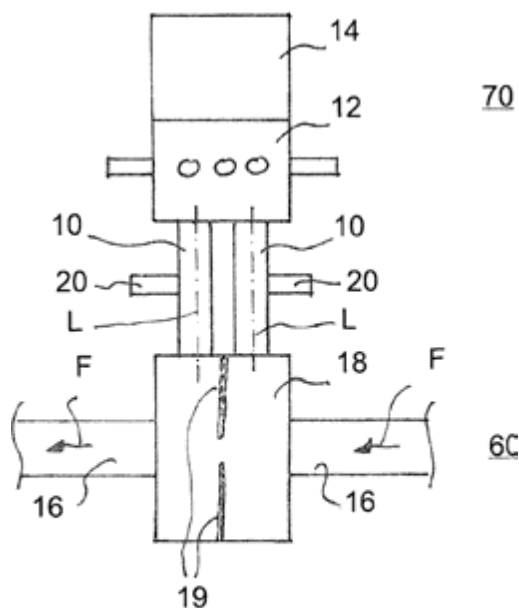


Fig. 6

Id. at Fig. 6.

55. Once the upper and lower ends of connecting apparatus 10 are connected to measuring instrument 14 and pipeline 16, nut 50 (blue) is rotated to clamp and seal the upper and lower ends together. *Id.* at 6:61-7:3, 7:37-45. The nut 50 (blue) interconnects the first and second connecting devices 30 and 40 with sealing effect. Once installed, an operator can measure gas flow through pipeline 16. *Id.* at 5:31-41.

56. Fig. 1 of the '030 Patent (shown below annotated with color) illustrates a cross-section of connecting apparatus 10 with first connecting device 30 (green) and second connecting device 40 (lime green) clamped together via nut 50 (blue). *Id.* at Fig. 1, 4:51-55.

Safety shutoff valve 20 (**orange**) is coupled to second connecting device 40 (**lime green**). *Id.*

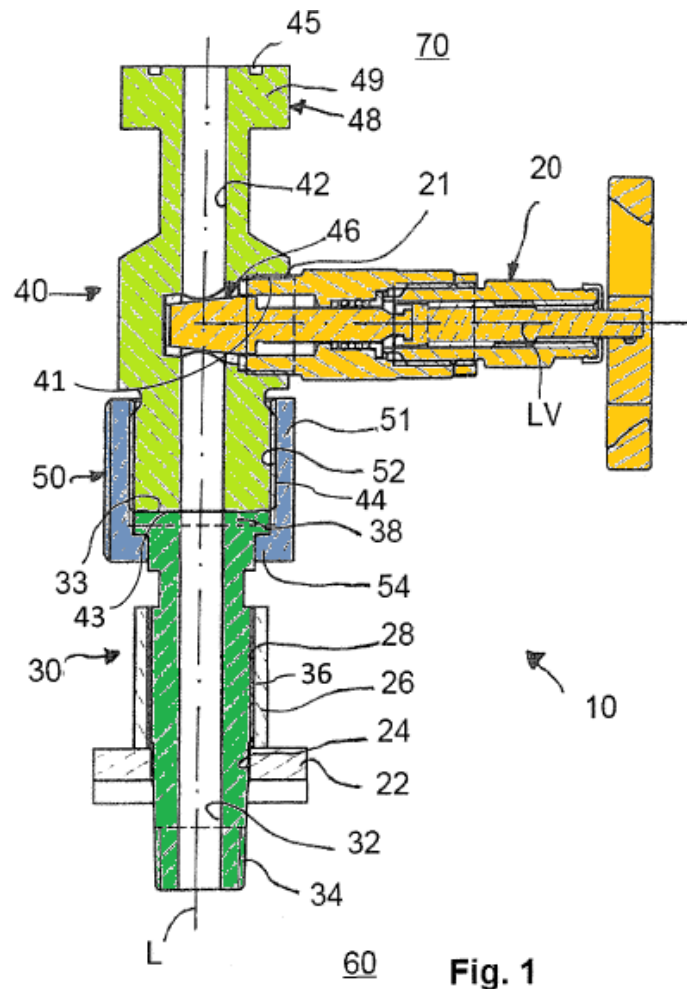


Fig. 1

57. First connecting device 30 includes opening 32 in longitudinal direction L and outer flange 38 at its upper end. *Id.* at 6:9-26. Base plate 22 and clamping nut 26 are provided at the lower end for clamping the first connecting device 30 (**green**) to metering orifice device 18 on pipeline 16. *Id.* at 6:19-24, 7:25-31. Second connecting device 40 (**lime green**) also includes opening 42 in fluid communication with the opening 32 of first connecting device 30 (**green**). *Id.* at 6:27-28. The lower end of second connecting device 40 (**lime green**) has male or outer thread 44. *Id.* at 6:27-29, 6:51-52. The upper end of second connecting device 40 (**lime green**) has upper connecting unit 48 for connecting the upper end of connecting apparatus 10 to measuring

instrument 14. *Id.* Upper connecting unit 48 has connecting flange 49, which is configured to engage valve block 12 of measuring instrument 14. *Id.* at 6:41-43.

58. Shutoff valve 20 (**orange**) extends laterally from second connecting device 40 (**lime green**). *Id.* at 6:30-40. Shutoff valve 20 can selectively open and close opening 42 of second connecting device 40 (**lime green**). *Id.* An operator can turn shutoff valve 20 (**orange**) to stop gas flow between pipeline 16 and measuring instrument 14. *Id.* at 5:47-57.

59. The '030 Patent describes that the two connecting devices 30 and 40 are interconnected by the nut 50 (**blue**) with “sealing effect.” *Id.* at 5:64-6:5. As seen in Fig. 1 (reproduced above), nut 50 (**blue**) has female thread 52 and inner flange 54. *Id.* at 6:55-58. Female thread 52 of nut 50 (**blue**) engages with male thread 44 of second connecting device 40 (**lime green**). *Id.* at 7:10-21, 7:37-45. Inner flange 54 of nut 50 (**blue**) engages with outer flange 38 of first connecting device 30 (**green**). *Id.* First and second connecting devices 30, 40 are compressed together when nut 50 (**blue**) is rotated, creating a seal between the ends of first and second connecting devices. *Id.* at 6:61-7:3.

VI. CLAIM CONSTRUCTION OPINIONS

- A. **the connecting unit is designed as a nut unit with a female thread and an inwardly pointing inner flange which is arranged in the lower edge region,” (claim 1)**

RJ Machine’s Construction	AS-Schneider’s Construction
Indefinite	Plain and ordinary meaning

60. In my opinion as a POSITA, this term, when viewed in light of the intrinsic and extrinsic evidence, fails to inform a POSITA about the scope of the invention with reasonable certainty and is indefinite.

61. Claim 1 of the '030 Patent recites:

a lower edge region of the second connecting device has a male thread and an end-face sealing surface,

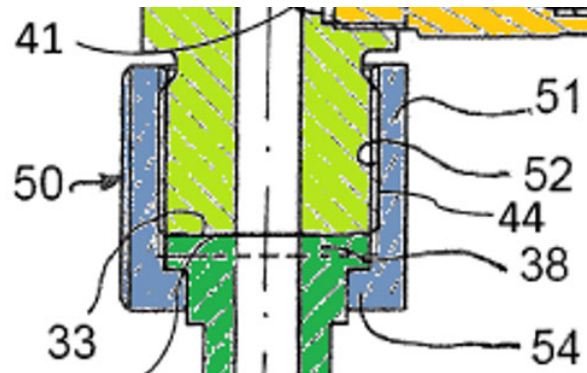
the connecting unit is designed as a nut unit with a female thread and an inwardly pointing inner flange which is arranged in *the lower edge region*

Ex. A at 8:66-9:3 (emphasis added).

62. Based on the claim language and antecedent basis principles, a POSITA would understand the term “the lower edge region” must refer to the fuller term previously recited in the claim, i.e., “a lower edge region *of the second connecting device.*”

63. The claimed connecting unit and inner flange are clearly disclosed in the '030 Patent. “Connecting unit” is shown in the figure below as element 50 (blue). Ex. A at Fig. 1, 5:64-6:5, 6:55-58. The connecting unit 50 is defined as a “nut unit 51.” *Id.* at 6:55-58, 7:21, 7:41.

Connecting unit 50 has an inwardly pointing inner flange 54. *Id.* at Fig. 1, 5:64-6:5, 6:55-58. The '030 Patent does not define the claimed “lower edge region of the second connecting device.” A portion of the second connecting device is



highlighted in lime green. *Id.* at 5:64-6:5. The patent specification describes second connecting device 40 as having a lower edge region but does not explain where that region begins and ends. *See id.* at 3:19-34, 4:6-10, 6:27-29, 6:55-58.

64. In my opinion as a POSITA, this term is indefinite for at least two reasons.

65. First, the term “arranged” does not have a clear meaning in the claims, specification, or extrinsic evidence. The claim does not explain what it means for parts of the connecting unit (blue) to be “arranged” in the lower edge region of the second connecting device (lime green).

66. The specification states “the connecting unit is designed as a nut unit with a female thread and an inwardly pointing inner flange which is arranged in the lower edge region facing the pipeline.” *Id.* at 3:25-28. This language does not explain what it means for parts of the connecting unit (**blue**) to be “arranged” in the lower edge region of the second connecting device (**lime green**). Nor do any other parts of the specification provide an explanation.

67. The term “arranged” is not a mechanical term. It has no special meaning in the petroleum or mechanical engineering field. The term “arranged” is not a typical or clear way to describe the relationship between mechanical components. Without explanation, a POSITA would not know what it means for components in a tool to be “arranged” with respect to each other. The term “arranged” is particularly confusing when referring to the “lower edge region of the second connecting device”, because that region is not defined in the patent and thus does not have a discernable area from which a POSITA could determine how and where the components are “arranged.”

68. Second, the ambiguity is compounded because a POSITA would not know what term “arranged” refers to. The claim recites “...an inwardly pointing inner flange which is arranged in the lower edge region.” *Id.* at 9:2-3. A POSITA would most naturally read this to mean the term “arranged” refers to the term “inner flange,” such that the limitation requires the “inner flange” of the connecting unit be “arranged in the lower edge region [of the second connecting device].” Assuming this interpretation is correct, the claim makes even less sense. As shown in the above close-up of the connecting unit, inner flange 54 and the lower end of the second connecting device 40 (**lime green**) are not in contact. *Id.* at Fig. 1. They are separated by the upper end of first connecting device 30 (**green**). A POSITA would not understand what it means for inner flange 54 of connecting unit 50 (**blue**) to be “arranged in” the lower edge region when inner

flange 54 and second connecting device 40 (**lime green**) are separate components that do not make contact. The '030 Patent does not explain any relationship between those two components.

69. Based on the foregoing, it is my opinion that the limitation “the connecting unit is designed as a nut unit with a female thread and an inwardly pointing inner flange which is arranged in the lower edge region” fails to inform a POSITA about the scope of the claimed invention and is indefinite.

B. “the outwardly pointing outer flange of the first connecting device fits behind the inner flange of the nut unit” (claim 1)

RJ Machine’s Construction	AS-Schneider’s Construction
Indefinite	Plain and ordinary meaning

70. In my opinion as a POSITA, this term, when viewed in light of the intrinsic and extrinsic evidence, fails to inform a POSITA about the scope of the invention with reasonable certainty and is indefinite.

71. The term “behind” does not have a clear meaning in the claims, specification, or extrinsic evidence.

72. Claim 1 recites the outer flange of the first connecting device “fits behind” the inner flange of the nut unit. Ex. A at 9:4-5. This language does not describe the mechanical relationship between the outer flange and the inner flange to a POSITA with reasonable certainty. A POSITA would understand the claim does not include any other language explaining the mechanical relationship between the outer flange and the inner flange.

73. The specification states “wherein the outer flange of the first connecting unit fits behind the inner flange of the nut unit and the female thread of the nut unit is screwed onto the male thread of the second connecting device....” *Id.* at 3:28-31. This language does not explain the mechanical relationship between the outer flange and the inner flange. That mechanical

relationship is not described in the specification.

74. The term “behind” does not have special meaning in the petroleum or mechanical engineering field.

75. Merriam Webster defines “behind” as “in, to or toward the back” or “in a secondary or inferior position” Ex. C at 1. This is not a typical or clear way to describe the relationship between mechanical components. Behind describes a directional relationship between objects. Directional relationships depend on the perspective of the viewer and their subjective interpretation of what they are viewing. Without an explanation, a POSITA would not know what it means for one component in a tool to be “behind” another.

76. For example, referring to the figure to the right, if one is looking at connecting apparatus 10 from the side (e.g., looking directly at the figure), one might conclude outer flange 38 is not behind inner flange 54; rather, outer flange 38 sits on top of inner flange 54. If one rotated the figure to view the tool looking downwards from the top, one might conclude outer flange 38 is not behind inner flange 54; rather, inner flange 54 is behind outer flange 38. If one rotated the figure to

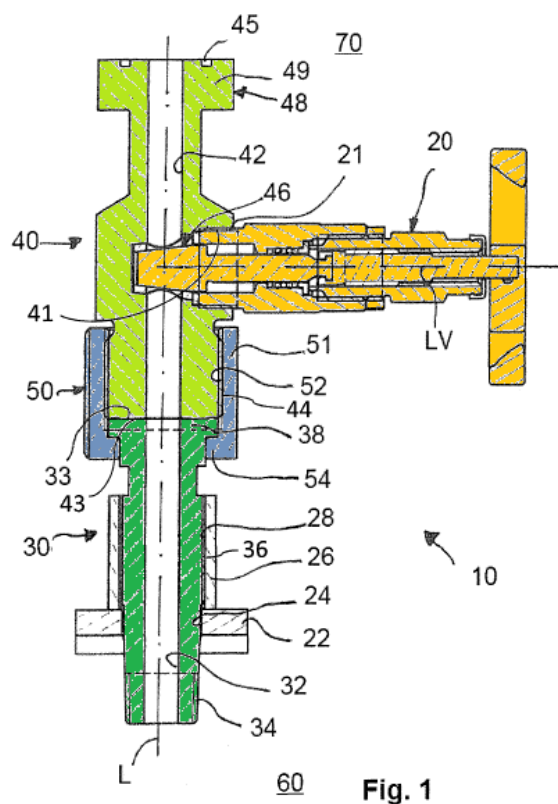


Fig. 1

view the tool from the bottom, in this orientation one might conclude outer flange 38 would be behind inner flange 54. However, this latter interpretation would contradict the directional relationship between the components when viewed from any other orientation.

77. RESERVED.

78. It is my opinion that the term “behind” is inherently ambiguous. For this reason, a given viewer might not conclude outer flange 38 is behind inner flange 54 when viewed from any orientation.

79. For the above reasons, a POSITA would not describe a tool based on a directional relationship between components, because that description depends on the viewing direction, is confusing, and does not clearly describe the relationship between components in a tool.

80. Based on the foregoing, it is my opinion that the limitation “the outwardly pointing outer flange of the first connecting device fits behind the inner flange of the nut unit” fails to inform a POSITA about the scope of the claimed invention and is indefinite.

C. “...by means of the inner flange and the outer flange the end-face sealing surfaces are clamped together with sealing effect,” (claim 1)

RJ Machine’s Construction	AS-Schneider’s Construction
Subject to 35 U.S.C. §112(f) (means-plus function) <u>Function</u>: the first connecting device and the second connecting device are sealed together <u>Structure</u>: an outer flange and an inner flange clamped together by female threads of a nut engaging male threads of the second connecting device such that end-face sealing surface 43 clamps to end-face sealing surface 33 to create a seal, as shown in Fig 1.	Plain and ordinary meaning

81. In my opinion as a POSITA, the language of this claim limitation is in the form of a means-plus-function claim limitation for two reasons. First, the limitation recites “by *means* of the inner flange and the outer flange the end-face sealing surfaces are clamped together with sealing effect.” Ex. A at 9:7-10 (emphasis added). Second, a POSITA would understand the

claim limitation does not recite definite structure in support of its function. Specifically, while it recites an outer flange and an inner flange, it does not describe the structure by which those flanges are clamped to have sealing effect.

82. A POSITA would understand the claimed function of this limitation is “the first connecting device and the second connecting device are sealed together.” This function is described in the specification.

83. For example, referring to Fig. 1 (reproduced below with color annotations added), the specification states first connecting device 30 (**green**) and second connecting device 40 (**lime green**) are “interconnected with sealing effect by, for example, the connecting unit 50 [**blue**] clamping an end-face sealing surface 43 of the second connecting device 40 to an end-face sealing surface 33 of the first connecting device 30 with sealing effect.” *Id.* at 5:64-6:5. The specification also states that “by means of the inner flange and the outer flange the **end-face sealing surfaces are clamped to each other with sealing effect.**” *Id.* at 3:19-34 (emphasis added).

84. This construction of function will be simple for the jury to understand, is supported by the above descriptions in the specification, and explains the outcome of the claimed structures, described next.

85. Referring to the below figure, the specification describes the following structures involved in sealing the first and second connecting devices together:

The connecting unit 50 is designed as a nut unit 51 with a female thread 52 and an inwardly pointing inner flange 54 provided in the lower edge region. ... the connection between first connecting device 30 and second connecting device can be created via the connecting unit 50...by the clamping action with sealing effect being carried out solely by operation, that is to say by rotation, of the connecting unit 50. In this case, the two sealing surfaces 33,43 are clamped together with sealing effect.

Id. at 6:55-7:3.

86. In light of these teachings, a POSITA would understand the claimed structure to be “an outer flange and an inner flange clamped together by female threads of a nut engaging male threads of the second connecting device such that end-face sealing surface 43 clamps to end-face sealing surface 33 to create a seal, as shown in Fig 1.” This construction of structure includes all of the structures described in the specification that relate to the function of sealing together the first and second connecting devices.

87. Based on the foregoing, it is my opinion that the limitation “...by means of the inner flange and the outer flange the end-face sealing surfaces are clamped together with sealing effect” is a means-plus-function limitation and a POSITA would construe the function this claim limitation as “the first connecting device and the second connecting device are sealed together” and the structure of this limitation as “an outer flange and an inner flange clamped together by female threads of a nut engaging male threads of the second connecting device such that end-face sealing surface 43 clamps to end-face sealing surface 33 to create a seal, as shown in Fig 1.”

D. “a longitudinal axis of which extends obliquely to a longitudinal axis of the apparatus,” (claim 1)

RJ Machine’s Construction	AS-Schneider’s Construction
Indefinite	Plain and ordinary meaning

88. In my opinion as a POSITA, this term, when viewed in light of the intrinsic and extrinsic evidence, fails to inform a POSITA about the scope of the invention with reasonable certainty and is indefinite.

89. The term “extends obliquely” does not have a clear meaning in the claims or specification.

90. Claim 1 recites “a shutoff valve is connected to the second connecting device, a

longitudinal axis of which *extends obliquely* to a longitudinal axis of the apparatus.” Ex. A at 9:11-13 (emphasis added). In my opinion as a POSITA, claim 1 does not define the scope of the term “extends obliquely.” It also does not include any other limitations relating to the scope of “extends obliquely”.

91. Claim 7 recites the axis is “at an angle of 90 degrees.” *Id.* at 10:21-23. Based on the language of claims 1 and 7, a POSITA would understand “extends obliquely” includes at least a 90-degree angle and covers some other range of angles. However, those other angles are not identified in the claims or the specification, discussed next.

92. Referring to Fig. 1 (reproduced below with color annotations added), connecting apparatus 10 includes shutoff valve 20 (**orange**), “the longitudinal axis of which extends obliquely to the longitudinal axis of the apparatus **especially at an angle of 90°**, is connected to the second connecting device.” *Id.* at 3:47-51 (emphasis added); *see also id.* at 10:21-23. In Figure 1, the axis of shutoff valve 20 (identified as LV) is clearly shown at a 90-degree angle from longitudinal axis L of second connecting device 40 (**lime green**). In my opinion as a POSITA, the specification does not disclose any other angles that might be covered by the term “extends obliquely.”

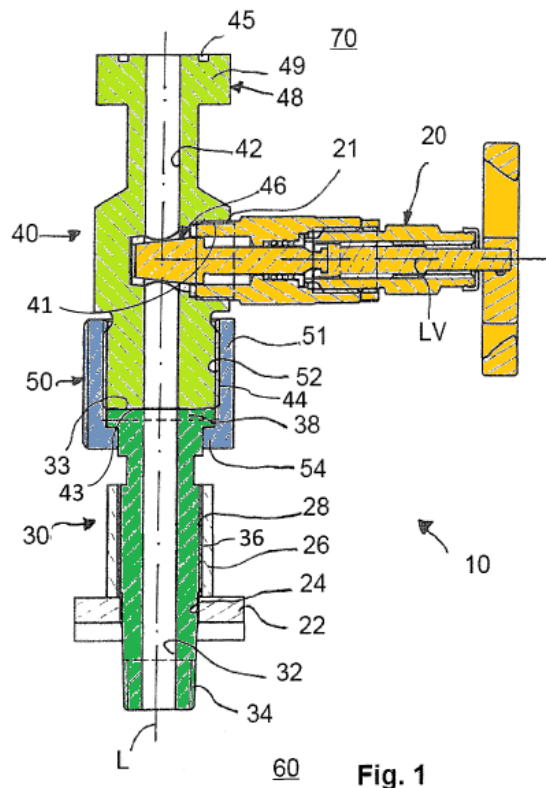


Fig. 1

93. A POSITA would know that an “oblique angle” extends in either an acute or obtuse manner, but **not** at right angle (90°). This is well-known and understood as a basic geometry fact.

94. A POSITA’s knowledge is consistent with the definition of “oblique” from Merriam Webster. Ex. D at 1. Merriam Webster defines “oblique” as “neither perpendicular nor parallel”, “having the axis not perpendicular to the base” and “having no right angle.” *Id.*

95. A POSTIA’s knowledge is also consistent with the definition of “oblique angle” from the website Math-Dictionary.com. Ex. E. Math-Dictionary.com defines an “oblique angle” as “an angle that is not a right angle. In other words, an oblique angle is either acute or obtuse.” *Id.*

96. The well-understood meaning of “oblique” contradicts the patentee’s description of an oblique angle being “especially at an angle of 90 degrees.” But the patentee does not clearly state in the intrinsic evidence that the patentee is not using “oblique angle” in its ordinary way.

97. It is my opinion that a POSITA could not know the scope of “extends obliquely” because the ’030 describes it in a way that contradicts its well understood meaning and fails to describe its scope, including a range of angles.

98. Based on the foregoing, it is my opinion that the limitation “a longitudinal axis of which extends obliquely to a longitudinal axis of the apparatus” fails to inform a POSITA about the scope of the claimed invention and is indefinite.

E. “the outer flange and the inner flange are provided in an encompassing manner on the first connecting device or on the nut unit,” (claim 1)

RJ Machine’s Construction	AS-Schneider’s Construction
Indefinite	Plain and ordinary meaning

99. In my opinion as a POSITA, this term, when viewed in light of the intrinsic and extrinsic evidence, fails to inform a POSITA about the scope of the invention with reasonable certainty and is indefinite.

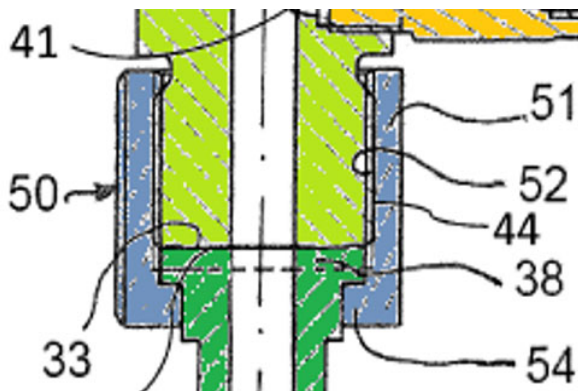
100. The term “encompassing manner” does not have a clear meaning in the claims, specification, or extrinsic evidence.

101. Claim 1 recites “the outer flange and the inner flange are provided in *an encompassing* manner on the first connecting device or on the nut unit.” Ex. A at 9:13-15 (emphasis added).

102. In my opinion as a POSITA, the claims do not recite any limitations that explain or define the term “encompassing manner.”

103. The specification of the ’030 Patent describes the claimed outer flange and inner flange. It does not describe the claimed “encompassing manner.” Specifically, referring to Fig. 1 (reproduced below with color annotations added), first connecting device 30 (**green**) has outer

flange 38. *Id.* at Fig. 1, 6:11-13. Connecting unit 50/nut unit 51 (blue)² (blue) has inner flange 54. *Id.* at 6:55-58.



104. The specification teaches that outer flange 38 abuts inner flange 54. *Id.* at 7:10-14. That abutment is clearly seen in the above figure.

105. The specification refers to “encompassing manner” once. It states “the outer flange and the inner flange are provided in an encompassing manner on the first connecting device or the nut unit.” *Id.* at 3:56-58. In my opinion as a POSITA, this reference to “encompassing manner” does not explain or define that term. Nor is the term explained or defined elsewhere in the specification.

106. The term “encompassing manner” does not have special meaning in the petroleum or mechanical engineering field.

107. Merriam Webster defines the term “encompass or encompassing” as “include, comprehend” and “envelop.” Ex. F at 1.

108. A POSITA would not know what it means for outer flange 38 and inner flange 54 to be provided in an “including” or “enveloping” manner. It does not make any sense to describe outer flange 38 and inner flange 54 as being provided in an including or enveloping manner. A

² In the '030 Patent, connecting unit 50 and nut unit 51 are the same component. *See e.g.* Ex. A, 6:55-58 (“connecting unit is designed as a nut unit”); *see also id.* at 7:21, 7:41.

POSITA would not describe a relationship between components as “including” or “enveloping,” as those terms are ambiguous and unclear.

109. In my opinion as a POSITA, the term “encompassing manner” is even more confusing when considered in the context of the entire claim. The claim recites the outer flange and inner flange “are provided in an encompassing manner on the first connecting device or on the nut unit.” Ex. A at 9:13-15. That limitation has two alternatives.

110. The first alternative is the outer flange and inner flange “are provided in an encompassing manner on the first connecting device.” The term “encompassing manner” does not make sense as used in this alternative because the outer flange is a part of the first connecting device (*see* Fig. 1 above, outer flange 38 is part of first connecting device 30). *See id.* at 6:11-13. A POSITA would not know what it means for the outer flange and inner flange to have some mechanical relationship “*on* the first connecting device...” when the outer flange is a part of the first connecting device.

111. The second alternative is the outer flange and inner flange “are provided in an encompassing manner ... on the nut unit.” The term “encompassing manner” does not make sense as used in this alternative because the inner flange is part of the nut unit (*see* Fig. 1 above, inner flange 54 is a part of connecting unit 50/nut unit 51). Additionally, the outer flange is completely surrounded by the walls of the nut unit 51 (*see* Fig. 1 above, outer flange 38 is surrounded by nut unit 51). *See id.* at 6:55-58. A POSITA would not know what it means for the outer flange and inner flange to be in an encompassing manner “*on* the nut unit”, when the inner flange is a part of the nut unit and the outer flange is surrounded by the nut unit.

112. Based on the foregoing, it is my opinion that the limitation “the outer flange and the inner flange are provided in an encompassing manner on the first connecting device or on the

nut unit” fails to inform a POSITA about the scope of the claimed invention and is indefinite.

F. “sealing means are arranged between the end-face sealing surface of the first connecting device and the end-face sealing surface of the second connecting device” (claim 1)

RJ Machine’s Construction	AS-Schneider’s Construction
Subject to 35 U.S.C. §112(f) (means-plus function) <u>Function</u>: a seal is created between the end-face sealing surface of the first connecting device and the end-face sealing surface of the second connecting device. <u>Structure</u>: O-rings consisting of sealing plastic such as PTFE, elastomer or graphite that are arranged inside a groove; an end-face coating made of sealing material; or a face-turned surface on the first connecting device and a projecting nose unit on the second connecting device.	Plain and ordinary meaning

113. In my opinion as a POSITA, the language of this claim limitation is in the form of a means-plus-function claim limitation for two reasons. First, the limitation recites “sealing *means* are arranged between the end-face sealing surface of the first connecting device and the end-face sealing surface of the second connecting device.” Ex. A at 9:16-19 (emphasis added). Second, a POSITA would understand the claim limitation does not recite definite structure in support of its function. Specifically, while it recites a “sealing means”, it does not recite any structure, such as types of materials that are used to form the seal.

114. A POSITA would understand the claimed function of this limitation is to create a seal between the first and second connecting devices.

115. This function is described in the specification as follows:

wherein according to an advantageous development sealing means are arranged between the upper end side/end face of the outer flange of the first connecting device and the lower end side/end face of the second connecting

device.”

Id. at 3:58-62.

“In an embodiment variant, which is not shown, provision is made between the end-face sealing surface 43 and the end-face sealing surface 33 ***for sealing means which ensure a permanently reliable sealing function.***”

Id. at 7:46-49 (emphasis added).

116. A POSITA would construe the function of this claim limitation as “a seal is created between the end-face sealing surface of the first connecting device and the end-face sealing surface of the second connecting device.” This construction will be simple for the jury to understand, is supported by the above descriptions in the specification, and explains the outcome of the claimed structures, described next.

117. The specification describes the following structures involved in sealing the first and second connecting devices together:

For example, provision can be made for O-rings consisting of sealing plastic such as PTFE, elastomer or graphite which for example are arranged inside a groove. A coating of the end faces with sealing material also come into consideration. An especially good sealing function with high press-on pressure can also be ensured by, for example the end face of the first connecting device having a face-turned surface and by the end face of the second connecting device having a turned projecting nose unit.

Id. at 3:63-4:5.

118. In light of these teachings, a POSITA would understand the claimed structure to be “O-rings consisting of sealing plastic such as PTFE, elastomer or graphite that are arranged inside a groove; an end-face coating made of sealing material; or a face-turned surface on the first connecting device and a projecting nose unit on the second connecting device.” This construction of structure includes all of the types of seals disclosed in the specification that can be used to create a seal between the first and second connecting devices.

119. Based the foregoing, it is my opinion that the limitation “sealing means are arranged between the end-face sealing surface of the first connecting device and the end-face sealing surface of the second connecting device” is a means-plus-function limitation and a POSITA would construe the function of this claim limitation as “a seal is created between the end-face sealing surface of the first connecting device and the end-face sealing surface of the second connecting device” and the structure of this limitation as “O-rings consisting of sealing plastic such as PTFE, elastomer or graphite that are arranged inside a groove; an end-face coating made of sealing material; or a face-turned surface on the first connecting device and a projecting nose unit on the second connecting device,” respectively

Pursuant to 28 U.S.C. §1746, I declare under penalty of perjury that the foregoing is true and correct.

Dated: 06/04/2024


By: _____
Dr. John P. Rodgers

Appendix A

JOHN P. RODGERS, Ph.D., P.E.

54 DANBURY RD. #348
RIDGEFIELD, CT 06877

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EMAIL: RODGERS@STARBOARDINNOVATIONS.COM

EDUCATION

Massachusetts Institute of Technology
Cambridge, Massachusetts
Department of Aeronautics and Astronautics

-Ph.D. received October 1998.

Major in Structures Technology and Minor in Estimation and Control.

Thesis Title: *Development of an Integral Twist-Actuated Rotor Blade for Individual Blade Control.*

-Master of Science received May 1995.

Thesis Title: *Modeling and Manufacturing of Adaptive Composite Plates Incorporating Piezoelectric Fiber Composite Plies.*

Duke University
Durham, North Carolina
Department of Mechanical Engineering and Material Science

-Bachelor of Science in Engineering received December 1992.

Graduation with Departmental Distinction

Scholarship Recipient, National Academy for the Advancement of Nuclear Power

-Second major in Mathematics.

AREAS OF EXPERTISE

Knowledgeable in a variety of fields related to mechanical, materials, and aerospace, and downhole engineering, including:

- | | |
|-----------------------------------|---|
| • Structural design and analysis | • Structural dynamics |
| • Actuation and sensing | • Active control systems |
| • Vibration and noise | • Polymer-matrix composites |
| • Smart materials | • Crash/shock survival |
| • Manufacturing and QC | • Heat transfer |
| • Fluid mechanics and dynamics | • Testing and characterization of materials, devices, systems |
| • Downhole tool design and test | • Machine design |
| • Forensic engineering | • Intellectual property |
| • Electromagnetics | • Instrumentation and sensing |
| • Aerodynamics and aeroelasticity | |

EXPERIENCE

Starboard Innovations, LLC, President, Founder
Ridgefield, CT
March 2000-present

Engineering consulting company specializing in concept development, new technology research, design, analysis, prototyping, and testing. Recent projects include:

RJMachine_001536

AS-Schneider Exhibit 2005
RJ Machine v AS-Schneider
IPR2024-00851
Page 36

- Development of multiple downhole oilfield tools and integration of new technologies including sensing, autonomous positioning, explosives safety, acoustic telemetry, remote power generation, vibration mitigation; multi-disciplinary FEA, electromagnetic design; support for field testing and operations; qualification testing for thermal, pressure, shock, explosive operations; strength analysis, damage prediction, and troubleshooting of mechanical systems; downhole equipment operation and design including fracturing equipment, perforating equipment, drilling equipment, wellbore plugging devices, valves; slickline, wireline, coiled tubing, tubing-conveyed, casing-conveyed, and drillstring tools; well completions.
- Development of shock simulation software package and shock sensing downhole tool for predicting, measuring, and optimizing perforating gun string and wellbore dynamics. Prediction of tool string failure under operational loading.
- Participation on multiple failure investigation teams that included extensive simulations and tests to demonstrate causation; successful in reducing client liability in negotiations. Rapid redesign of deficient design elements to enable a return to reliable service.
- Analysis of oilfield rig and surface equipment systems operations, including autodrillers, pipe handling tools, coiled-tubing injectors, umbilical handling, desanders, and produced water evaporators.
- Development and implementation of food production engineering systems for major snack food manufacturer.
- Support for large-scale power grid energy storage system design and installation.
- Litigation support and expert witness for plaintiff and defense involving trade secret, product liability, personal injury, contract disputes, and IP.
- Intellectual property development and research, competitive patent analysis.
- Rotorcraft vibration reduction using active material treatments and integrated on-blade actuation technology for Bell Helicopter (Variable Geometry Advanced Rotor Technology program)
- Crashworthy aircraft seat design using shape memory materials and rotorcraft occupant restraint systems for NASA and Air Force

More information at <http://www.starboardinnovations.com>

Midé Technology Corporation, Senior Engineer

Cambridge, Massachusetts

November 1998-February 2000

Active in technology, product, and business development.

- Co-developer, PowerAct™, a novel piezoceramic actuator/sensor
- Principal Investigator for Air Force-funded research program to develop advanced rotor concepts and team lead for Bell Helicopter Dynamically-Tailored Airframe Structures program

The MIT Active Materials and Structures Laboratory, Research Assistant

Cambridge, Massachusetts

May 1995-October 1998

- Project leader for design, manufacture, and hover testing of a Mach-scale active helicopter rotor blade for individual blade control of vibrations and noise
- Developed manufacturing process for and characterized active fiber composite piezoelectric actuators
- Teamed with Boeing as part of Smart Structures for Rotorcraft Consortium
- Aided in design and led implementation of Mach-scaled rotor test stand facility

RJMachine_001537

The MIT Space Engineering Research Center, Research Assistant

Cambridge, Massachusetts

January 1993-May 1995

- Developed a Rayleigh-Ritz model of a composite plate with embedded, anisotropic active materials and acoustic radiation
- Designed, manufactured, and tested adaptive composite plates with active plies

Duke University Department of Mechanical Engineering, Laboratory Assistant

Durham, North Carolina

May 1992-December 1992

- Fabricated and tested a fiberglass wind-tunnel model for measuring airfoil pressure distribution with LabView data acquisition system virtual instrument shell

NASA Langley Research Center, Configuration Aeroelasticity Branch, Intern

Hampton, Virginia

June 1991-August 1991

- Performed aerothermoelastic analysis of a NASP vertical tail using a finite element model

PROFESSIONAL ACTIVITIES

Licensed Professional Engineer (PE) in mechanical engineering in TX, ND, CT

American Society of Mechanical Engineers (ASME), Associate Member, PE License Review Instructor

Guest Lecturer at Texas Christian University, University of North Texas

Society of Petroleum Engineers (SPE), Member

American Institute of Aeronautics and Astronautics (AIAA), Member

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RJMachine_001538

AS-Schneider Exhibit 2005
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Craddock, G.G., Zhang, W., Wight, J., Rodgers, J., Glenn, T.S., Serra, M., and Bettenmann, T. "Investigating the Dynamic Three-Dimensional Loading Effects on Perforating Guns Imposed by Shaped Charges". Presented at the International Petroleum Technology Conference, Doha, Qatar, 19–22 January, 2014.

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M. R. Smith, R. J. Pascal, M. C. van Schoor, B. P. Masters, C. Blaurock, E. F. Precht, J. P. Rodgers, and D. S. Friedmann, "Dynamically Tailored Airframe Structures Program", Proceedings of the AHS 57th Annual Forum, Washington, DC, May 9-11, 2001.

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J.P. Rodgers and N.W. Hagood, "Hover Testing of a 1/6th Mach-Scale CH-47D Blade with Integral Twist Actuation", Proceedings of the 9th International Conference on Adaptive Structures and Technologies, Cambridge, MA, October 1998.

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RJMachine_001539

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J.P. Rodgers, "Aerothermoelastic Analysis of a NASP-Like Vertical Fin", Proceedings of the 33rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Dallas, TX, April 1992.

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10337299 – Perforating apparatus and method having internal load path
10161723 – Charge case fragmentation control for gun survival
10151152 – Perforating gun connectors
10138718 – Perforation crack designator
9909408 - Protection of electronic devices used with perforating guns
9909384 - Multi-actuating plugging device
9598940 - Perforation gun string energy propagation management system and methods
9447678 - Protection of electronic devices used with perforating guns (8978817*)
9091152 - Perforating gun with internal shock mitigation
9051812 - Through tubing bridge plug and installation method for same (10024132*)
9019798 - Acoustic reception
8985200 - Sensing shock during well perforating
8978817 - Protection of electronic devices used with perforating guns
8978749 - Perforation gun string energy propagation management with tuned mass damper
8893801 - Method and apparatus for pressure-actuated tool connection and disconnection
8881816 - Shock load mitigation in a downhole perforating tool assem.
(8714252*,8714251*)
8714270 - Anchor assembly and method for anchoring a downhole tool
8555959 - Compression assembly and method for actuating downhole packing elements
8490686 - Coupler compliance tuning for mitigating shock produced by well per. (8393393*)

8408286 - Perforating string with longitudinal shock de-coupler (8397800*)
8397814 - Perforating string with bending shock de-coupler
7781939 - Thermal expansion matching for acoustic telemetry system (7557492*)
7595737 - Shear coupled acoustic telemetry system
7363967 - Downhole tool with navigation system
7325605 - Flexible piezoelectric for downhole sensing, actuation and health mon (7234519*)
7322416 - Methods of servicing a well bore using self-activating downhole tool
7246660 - Borehole discontinuities for enhanced power generation

*Denotes additional patents in same family.

JOHN P. RODGERS, Ph.D., P.E.

CASE SUMMAR

Start Date	Case	Party	Venue	Case Type	Firm	Outcome	Depo	Court Testify
TOTALS:							20	10
2023	WELLMATICS/GR ENERG V. CANATEX	Canatex	PTAB	IPR	Cabello Hall Zinda		0	0
2022	CANATEX v. WELLMATICS/GR ENERG	Canatex	S. Distr. TX	Infringe	Cabello Hall Zinda		0	1
2022	IMDEX/AUSTRALIAN MUD CO. v GLOBALTECH	Imdex	PTAB	IPR	Covington		0	0
2022	D NA ENERGETICS v. HUNTING TITAN, INC.	Dyna	S. Distr. TX	Infringe	Womble Bond Dickinson	No infringe patent valid	1	1
2021	G H DIVERSIFIED MFG. v. D NA ENERGETICS GMBH CO. KG	Dyna	PTAB	PGR	Womble Bond Dickinson	G H	1	0
2021	D NA ENERGETICS GMBH CO. KG v. SWM, NEXTIER	Dyna	PTAB	PGR	Womble Bond Dickinson		2	0
2021	SCHLUMBERGER V. D NA ENERGETICS	Dyna	PTAB	PGR	Womble Bond Dickinson	dropped	0	0
2021	D NA ENERGETICS V. SCHLUMBERGER	Dyna	S. Distr. TX	Infringe	Womble Bond Dickinson	dropped	0	0
2021	KLX V. MAGNESIUM MACHINE	KLX	W. Distr. OK	Contract/ trade secret	Shearman Sterling		1	0
2021	D NA ENERGETICS v. BEAR MANUFACTURING	Dyna	N. Distr. TX	Infringe.	Womble Bond Dickinson	dismissed	0	0
2021	D NA ENERGETICS v. OSO PERFORATING	Dyna	N. Distr. TX	Infringe.	Womble Bond Dickinson	dismissed	1	0
2021	D NA ENERGETICS v. SWM PERFORATING	Dyna	N. Distr. TX	Infringe.	Womble Bond Dickinson	dismissed	1	0
2021	HUNTING TITAN, INC. v. D NA ENERGETICS GMBH CO. KG	Dyna	PTAB	PGR	Womble Bond Dickinson		0	0
2021	NABORS v. H P/MOTIVE AND COUNTERCLAIM	Nabors	N. Distr. TX	Infringe.	Raley Bowick	Settled at trial	1	1
2020	HUNTING TITAN, INC. v. D NA ENERGETICS GMBH CO. KG	Dyna	PTAB	PGR	Womble Bond Dickinson	Dyna	0	0

2020	Varel v. Taurex	Varel	ITC	ITC	Raley Bowick	Settled	0	0
2020	Core Laboratories v. Stratum Reservoir	Core	S. Dist. TX	Infringe.	Seiler Mitby		0	0
2020	NCS MULTISTAGE INC., v. TCO PRODUCTS, Inc.	NCS	W. Dist. TX	Infringe.	Blank Rome	ury - NCS	2	1
2020-2022	NCS MULTISTAGE INC. v. Nine Energy Service, Inc.	NCS	W. Dist. TX	Infringe.	Blank Rome	ury - NCS	2	1
2020	HUNTING TITAN, INC. v. D NA ENERGETICS GMBH CO. KG	Dyna	PTAB	PGR	Womble Bond Dickinson	Dyna	0	0
2020-2021	IPT GLOBAL, LLC, and INNOVATIVE PRESSURE TESTING, LLC, v. OFFSHORE TECHNICAL COMPLIANCE LLC	IPT	S. Dist. TX	Infringe., IPR	Conley Rose	OTC	1	0
2019-2020	JAMES DAVID BAIRD v. MCA, MCA v. ASCO L.P.	ASCO/Emerson	Iowa, Scott Cty.	Liability	Pearce Durick	Settled	0	0
2019-2021	NATIONAL OILWELL VARCO v. MANOJ GOPALAN and RIME DOWNHOLE TECHNOLOGIES, LLC	NOV	Tarrant Cty. TX	Trade secret	Raley Bowick	Dropped	1	0
2018-2019	BAKER HUGHES v. INNOVEX DOWNHOLE SOLUTIONS	Innovex	PTAB	IPR	Kirkland Ellis	--	1	0
2018-2019	NATIONAL OILWELL VARCO v. COIL SOLUTIONS	NOV	Canadian Federal	Infringe.	Belmore Neidrauer	--	0	0
2018-2022	JAMES AINSWORTH v. NOBLE, PRUITT TOOL SUPPL	Pruitt	Harris Cty. TX	Liability	Raley Bowick, Donato Brown	Settled	0	0
2018-2019	SPECIALIZED DESANDERS v. ENERCORP	Enercorp	Canadian Federal	Infringe.	Miller Thomson	Settled	0	0
2018	WEATHERFORD TECHNOLOG HOLDINGS, LLC v. TESCO CORPORATION	TESCO/Nabors	US Eastern Dist. TX	Infringe.	Raley Bowick	Settled at trial	1	1
2018-2019	HUNTING TITAN, INC. v. D NA ENERGETICS GMBH	Dyna	PTAB	IPR	Womble Bond Dickinson	Dyna	0	0
2016-2018	NATIONAL OILWELL VARCO, L.P., v. TECHNICAL INDUSTRIES, INC	NOV	PTAB	IPR (4)	Raley Bowick	NOV (4)	1	0
2016-2020, 2023-2024	SIMMONS v. CUDD PRESSURE CONTROL, INC. MUREX PETROLEUM AND SPECIALIZED TECHNICAL THREADING, INC., TILLMAN ASSOCIATES, LLC	Cudd	NW Dist. ND	Liability	Pearce Durick, Sutter Law	Trial	1	2
2016-2017	TULLOW OIL VS. VALLOUREC	Vallourec	N/A	Pre-litigation	Clyde Co.	--	0	0
2015	WPX ENERG WILLISTON, LLC VS. ARMADA PRESSURE CONTROL, LLC TERVITA, LLC SAGE CONSULTING, LLC AND	Thru-Tubing	Harris Cty. TX	Liability	Brown Sims	Settled	0	0

	THRU-TUBING SOLUTIONS, INC.							
2013-2014	PEAK COMPLETION TECHNOLOGIES, INC. AND SUMMIT DOWNHOLE DYNAMICS, LTD., v. TEAM OIL TOOLS, L.P	Team	Dist. Court Midland, TX	Trade secret	Jackson Walker	Trial	1	1
2007-2009	TOTAL SEPARATION SOLUTIONS, LLC, v. F. ALAN "BUD" FRICK, BUTLER COOK, INC.	TSS	Harris Cty. TX	Trade secret	Fulkerson Lotz	Trial	1	1

Appendix B

Advanced science. Applied technology.

Search



ORIFICE FLOW METER CALIBRATION

[Home \(/\)](#) » [Industries](#) » [Energy & Environment \(/industry/energy-environment\)](#)

» [Oil & Gas \(/industries/oil-gas\)](#) » [Flow Measurement Services \(/industries/flow-measurement-services\)](#)

» [Flow Meter Calibration Services \(/fluid-dynamics-flow-measurement/flow-meter-calibration-services\)](#)

» [Orifice Flow Meter Calibration](#)

Orifice meters measure flow rates using differential pressure created when a fluid passes through an orifice plate. The flow calculations use a form of the Bernoulli equation with an empirical discharge coefficient. Orifice flow meter calibration helps reduce uncertainty in the discharge coefficient from 0.5% to 0.25%.

Orifice meters are normally built to specification from standards such as API 14.3, AGA 3, and ISO 5167. Southwest Research Institute performs flow calibrations to lower uncertainty by matching the Reynolds number to the final application. Improved flow measurement improves accuracy for computing plant efficiency, system balances and end-user consumption.

Orifice Plate Calibration & Flow Meter Services



Flow calibration of an orifice flange fitting and plate over the application Reynolds number.

AS-Schneider Exhibit 2005

Reynolds number AS-Schneider

IPR2024-00851

Page 46

range.

Flow calibrations and tests at SwRI typically require one day for setup and checkout and half a day for testing. Clients can witness tests in person or monitor remotely. Reports can be generated that reference either API 14.3/AGA-3, ASME PTC 19.5, or any other commonly used orifice meter standard.

ISO 5167 Differential Flow Meter Services

In addition to orifice plates and meters, we calibrate and test other ISO 5167 differential flow meters:

- Cone meters
- Averaging pitot meters, anemometers and other velocity flow meters
- Subsonic venturis (ASME MFC-7M and ISO 9300)
- Wedge flow meters

Orifice Flow Meter Troubleshooting & Research

SwRI has been a leader in orifice meter diagnostics for many years as evidenced by the development of the patented square root error indicator (/node/5451216/). Pulsation detection and assessment is just one of the services that we can provide to improve your measurement. SwRI can provide field audits of meter stations that include orifice meters and suggest operational and configuration changes to improve your measurement.

Many improvements to the orifice meter standards were verified by testing at SwRI's Metering Research Facility. Visit Flow Measurement Research Programs (/node/8606/) to learn how SwRI has is helping to advance technology for orifice flow meters and other flow measurement systems.

Flow Measurement & Metering Research

- Flow Measurement Services (/taxonomy/term/508/)
- Flow Measurement Research Programs (/node/8606/)
- Flow Meter Calibration Services (/node/8596/)
- Flow Test Systems & Flow Calibration Capabilities (/node/8608/)
- Metering Research Facility (/node/8607/)
- Coriolis Flow Meter Calibration (/node/239216/)
- Turbine Meter Calibration (/node/982971/)
- Ultrasonic Meter Calibration (/node/2854031/)

CONTACT US (/user/3451/contact?path=/industry/flow-measurement-service)

Or call Adam Hawley at +1 210 522 3427. (tel:+1 210 522 3427)

**AS-Schneider Exhibit 2005
RJ Machine v AS-Schneider
IPR2024-00851
Page 47**

HOW CAN WE HELP YOU?



ADAM HAWLEY

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Natural Gas Measurement Field Services (/industry/flow-measurement-services/natural-gas-measurement-fi



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