

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TANKLOGIX, LLC,
Petitioner v.

SITEPRO, INC.,
Patent Owner

Case No. IPR 2025-00653

Expert Declaration in Support of Petitioner's Petition for *Inter Partes* Review of
U.S. Patent No. 11,726,504

DECLARATION OF GARY R. WOOLEY, Ph.D.

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I. INTRODUCTION

A. Background and Qualifications

1. My name is Gary R. Wooley. I have been retained by the petitioner TankLogix, LLC (“TankLogix”) in this Inter Partes Review (“IPR”) as an independent expert in the relevant art.

2. I have been asked to provide my opinions and views on the materials I have reviewed in the IPRs related to U.S. Patent Nos. 8,649,909 (“the ‘909 patent”); 9,342,078 (“the ‘078 patent”); 9,898,014 (“the ‘014 patent”); 10,488,871 (“the ‘871 patent”); 11,175,680 (“the ‘680 patent”); 11,294,403 (“the ‘403 patent”); and 11,726,504 (“the ‘504 patent”) (collectively, “the Challenged Patents”) and the scientific and technical knowledge regarding the same subject matter. I have been asked to consider what one of ordinary skill in the art would have understood from the Challenged Patents. I have also considered whether certain references disclose or suggest the features recited in the claims of the Challenged Patents. My opinions are set forth below.

3. My opinions are guided by my appreciation of how a person of ordinary skill in the art would have understood the claims of the Challenged Patents at the time of the alleged invention, which I have been asked to initially assume is December 7, 2012, the earliest claimed priority date of the Challenged Patents.

4. Based on my experience and expertise, it is my opinion that the

references discussed in detail below disclose or suggest all of the features recited in claims 1-17 and 19-21 of the '909 Patent; claims 1-8, 11-13 and 15-19 of the '078 Patent, claims 1-9 and 11-23 of the '014 Patent, claims 18-23, 25-32 and 34 of the '871 Patent; claims 1-3, 6-7, and 9-20 of the '680 Patent, claims 1-23 and 25-30 of the '403 Patent and claims 1-20 of the '504 Patent and that it would have been obvious to combine the features in the manner described below to arrive at the claimed invention. Nothing in any of the challenged claims is new or operates in a manner that would have been unexpected by a person of ordinary skill in the art.

5. I am currently the President of Wooley & Associates, Inc. Attached as Appendix A is my current resumé. I earned a Bachelor of Science degree in Mechanical Engineering, a Master of Science degree in Engineering Mechanics, and a Ph.D. in Engineering Sciences from Louisiana State University. I worked for four major oil companies (Shell, Chevron (twice), Exxon, and Arco) and have been providing petroleum and mechanical engineering consulting services to the petroleum industry since 1978. I served as Vice-President of Enertech Engineering and Research Company from 1978 to 1986 and have been President of Wooley & Associates, Inc. since 1986. I have been a member, invited speaker, and technical committee chair for various professional societies such as ASME, SPE, API, and ASM. I have published numerous peer-reviewed articles in the professional literature and have served as a reviewer of technical articles for SPE and ASME. I

am a member of the LSU ME Alumni Achievement Lecture Club, the LSU Engineering Hall of Distinction, the LSU Alumni Association Hall of Distinction, and Alumnus of the Year, and I currently serve as chair of the LSU College of Engineering Dean's Advisory Council.

6. With respect to the specific subject matter at issue in this IPR—remotely controlling fluid-handling devices at petroleum facilities—I have extensive experience. My early oilfield experience with four major oil companies exposed me to remote control of fluid handling at gas processing plants, drill sites, production facilities, and offshore platforms. Analog devices to remotely control fluid handling were used early on and are still in use. More recently, digital devices were introduced to remotely control fluid handling and have added many new capabilities. Recently I have worked on consulting projects that involve analog and digital control of drilling mud in wellbores for onshore and offshore wells. Digital remote control of fluid handling has significantly expanded recently during fracture stimulation of horizontally drilled oil and gas wells in shale formations. I have provided engineering consulting services on fracture stimulation using digital remote fluid handling, including well site visits and patent infringement evaluation.

B. Compensation.

7. In consideration for my services, my work on this case is being billed to Petitioner at an hourly rate of \$840 per hour, independent of the outcome of this

proceeding. I am also being reimbursed for reasonable expenses I incur in relation to my services provided for this proceeding.

II. METHODOLOGY AND MATERIALS CONSIDERED

8. My opinions expressed herein are based on my review of the Challenged Patents, their respective prosecution histories (including several patents listed within those prosecution histories), extrinsic evidence relating to the technology of the Challenged Patents, and other evidence cited in this declaration.

9. I further understand that the application resulting in the '909 Patent was filed on December 7, 2012, and that the remaining Challenged Patents are continuations of the '909 Patent and as such, share the same specification. My opinions are also based on my technical experience, knowledge, and expertise in the area of remotely controlling fluid-handling devices at petroleum facilities and saltwater disposal facilities.

10. More specifically, for this work, I have been asked to review the Challenged Patents including the specifications and claims, and the Challenged Patents' prosecution histories. In developing my opinions related to the Challenged Patents, I have considered the materials cited herein, including those items itemized in the Exhibit Table below.

Exhibit	Description
Ex 1001	U.S. Patent No. 11,726,504
Ex 1002	Declaration of Dr. Gary Wooley

Exhibit	Description
Ex. 1003	Curriculum Vitae of Dr. Gary Wooley
Ex. 1004	File Wrapper for U.S. Patent No. 11,726,504
Ex. 1005	U.S. Patent Application No. 2015/0308244 to Cardamone
Ex. 1006	US Patent 7,424,399 to Khan
Ex. 1007	SCADA: Supervisory Control and Data Acquisition, 4 th Edition (2010)
Ex. 1008	Judicial Caseload for Western District of Texas

11. This declaration contains my opinions with respect to the subject matter of this proceeding and with the understandings as set forth herein. I specifically reserve the right to formulate and offer additional or supplemental opinions based on any additional information, depositions, discovery, or evidence that may be provided or derived, future court rulings, or agreements between the parties, to the extent permitted by the Board.

III. OVERVIEW OF LEGAL CONSIDERATIONS.

12. My understanding of the law is based on information provided by counsel for Petitioner.

13. I do not have any formal legal training, and I am not an attorney. TankLogix's counsel has informed me of certain legal principles that I applied in my analysis. Those legal principles are summarized below.

14. The following section summarizes the law as I have been instructed to apply it in formulating and rendering my opinions found later in this declaration. I

understand that, in an *inter partes* review proceeding, patent claims may be deemed unpatentable if it is shown that they were anticipated or rendered obvious in view of the prior art. I understand that prior art in an *inter partes* review is limited to patents or printed publications that predate the priority date of the patent at issue.

A. Person of Ordinary Skill in the Art

15. I was asked to provide my opinion as a person of skill in the art (“POSITA”) as it relates to the Challenged Patents during the period leading up to the earliest claimed priority date. I considered several factors, including the types of problems encountered in the art, the solutions to those problems, the pace of innovation in the field, the sophistication of the technology, and the education level of active workers in the field. I provide that level below in Section IV.

B. Anticipation

16. I understand that when determining whether a claim is anticipated is based on underlying factual issues including the content of the prior art and the level of ordinary skill in the art. I further understand that for a single reference to anticipate a claim, “the four corners of [that] document describes every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation.” *In re Hodges*, 882 F.3d 1107, 1111 (Fed. Cir. 2018) (citing *Spansion, Inc. v. Int’l Trade Comm’n*, 629 F.3d 1331, 1356 (Fed. Cir. 2010)).

17. Invalidity for anticipation requires that “[t]he identical invention must be shown in as complete detail as contained in the patent claim.” *TF3 Ltd v. Tre Milano, LLC*, 894 F.3d 1366, 1374 (Fed. Cir. 2018).

C. Obviousness

18. I understand that, when determining whether a claim is “obvious,” the analysis is based on underlying factual issues including the content of the prior art and the level of ordinary skill in the art. I further understand that for a single reference or a combination of references to render the claimed invention obvious, a POSITA must have been able to arrive at the claims by modifying or combining the references.

19. I have further been informed and understand that a claim is unpatentable as obvious if the difference between the subject matter sought to be patented and the prior art is such that the subject matter as a whole would have been obvious at the time the invention was made to a POSITA.

20. I also have been informed and understand that the combination of familiar elements according to known methods is obvious when it does no more than yield predictable results. However, I further understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. I understand that, to prove a claim would have been obvious, one must demonstrate that a POSITA would have

been motivated to combine or modify the prior art to achieve the claimed invention while having a reasonable expectation of success in doing so.

21. I further understand that a claim may be obvious if common sense directs one to combine multiple prior art references or add missing features to reproduce the alleged invention recited in the claims. I also understand that if a POSITA could implement a predictable variation, then the claim is likely unpatentable. For the same reason, if a technique has been used to improve one device and a POSITA would recognize that it would improve similar devices in the same way, then using the technique is obvious. I further understand that a claim can be obvious if it combines old elements with no change to their respective functions, or alters prior art by merely substituting one element for another known in the field to yield a predictable result.

D. Claim Construction

22. I have been advised that “in an *inter partes* review proceeding, a claim of a patent ... shall be construed using the same claim construction standard that would be used to construe the claim in a civil action ..., including construing the claim in accordance with the ordinary and customary meaning of such claim as is understood by a POSITA.” 37 C.F.R. § 42.100(b). Each claim term challenged by this Petition should be construed in accordance with its ordinary and customary meaning for the purposes of resolving the issues raised in this Petition.

23. I have followed these principles in my analysis throughout this declaration.

IV. LEVEL OF ORDINARY SKILL IN THE ART

24. In determining the characteristics of a POSITA at the time of the claimed invention, several things should be considered, including the factors discussed below, as well as (1) the levels of education and experience of the inventor and other persons actively working in the relevant field; (2) the types of problems encountered in the field; (3) prior art solutions to these problems; (4) the rapidity in which innovations are made; and (5) the sophistication of the relevant technology.

25. All of the opinions that I provide herein are provided through the lens of a person having ordinary skill at the relevant time (prior to 2012, which I understand is the priority date claimed by the Challenged Patents). In my opinion, a POSITA at the time of the alleged invention would have had at least a bachelor's degree in engineering (electrical, chemical, or mechanical), computer science, or a related field and significant experience with remotely controlling fluid-handling devices, like SCADA systems. I am a person of ordinary skill in the art under the above-provided standard.

V. TECHNICAL BACKGROUND OF THE CHALLENGED PATENTS

A. Background of the Relevant Technology

26. The Challenged Patents relate to the remote operation of fluid-handling devices. In the oil and gas industry, fluid handling systems direct, measure, display,

and control the flow of fluids—liquid chemicals or condensed gases—across a manufacturing plant or factory. Because of the potential hazards posed by the fluids they manage, where possible, industrial oil and gas producers manage operations remotely to keep personnel out of harm's way. To enhance operational performance and improve worker safety, the oil and gas industry long ago adopted technologies for remote monitoring and control of fluid handling systems. <https://www.bakerhughes.com/oilfield-services-and-equipment-digital/remote-operations>.

27. The typical operation of industrial fluid handling systems places sensor and actuator functions on-site, supported by a remote controller that receives information from the sensors and transmits instructions to the actuators. *See e.g.* <https://www.eetimes.com/industrial-sensors-and-control-the-basics-part-i/>. The on-site sensors detect operational information such as flow rate, temperature, pressure, pH, or other fluid properties, and deliver that information to associated controller devices. <https://www.sciencedirect.com/topics/materials-science/sensor-system>.

28. The fluid handling components also include actuator functions that allow for electronic control of the components, thus enabling remote operation of system components, for example, motors, pumps, or valves, based on commands received from a controller device. *See, e.g.,* <https://www.fluidcontrols.co.uk/what-does-an-actuator->

do/#:~:text=Actuators%20are%20the%20unsung%20heroes,we%20know%20a%20lot%20about; see also, <https://www.emerson.com/en-us/industries/automation/marine/marine-systems-solution/valve-remote-control-systems>.

B. The Alleged Invention

29. The '504 Patent entitled "Remote Control of Fluid-Handling Devices," describes a fluid processing system having a first computer system disposed at a first fluid handling site that is configured to receive information comprising one or more properties of a first fluid from one or more sensors disposed at a first fluid tank itself disposed at the first fluid-handling site, the fluid-handling site comprising one or more fluid-handling devices, the one or more fluid-handling devices comprising one or more of a first pump, a first filter, and a first valve; and provide remote control of a first fluid-handling device of the one or more fluid-handling devices; and a server system. Ex. 1001, Claim 1.

30. The server system receives a first fluid property of the one or more properties associated with the first fluid sensed by a first sensor of the one or more sensors; obtains credentials from a first client computing device; determines that a user of the first client computing device is authorized to interact with the first fluid handling site, provides information by which a first client computing device presents a user interface indicating the first fluid property, receives a first command to change

a state of the first fluid-handling device and changing the state of the first fluid-handling device to a sequence of different target states that change over time. *Id.*

C. Prosecution History Summary (Ex. 1004)

31. The application resulting in the '504 Patent was filed on 2/25/2022. The present application is a continuation of U.S. Patent Application 17/513,539 filed on October 28, 2021, titled Remote Control of Fluid-Handling Devices. U.S. Patent Application 17/513,539 is a continuation of 16/656,319 filed October 17, 2019, which is a continuation of U.S. Patent Application 15/867,077 filed January 10, 2018, which is a continuation of U.S. Patent Application 14/984,422 filed December 30, 2015, which is a continuation of U.S. Patent Application 14/147, 190, issued as U.S. Patent 9,342,078, filed January 3, 2014, which is a continuation of U.S. Patent Application 13/708,557, issued as U.S. Patent 8,649,909, filed December 7, 2012. Ex. 1001, Cover.

32. In a July 12, 2022, first office action, the Examiner rejected Claims 1-20 under 35 U.S.C. 101 as claiming the same invention as that of Claims 1-20 of prior U.S. Patent No. 11,294,403. Ex. 1004, at 1653-64.

33. On March 7, 2023, the Applicant filed an Amended and Response to the Office Action canceling claims 2, 3, 15, 18, and 20, amending claims 1, 6-7, 9, 11, 13-14, and 17, and adding new claims 21-25. Ex. 1004, at 585-607. Additionally, the Applicant filed a terminal disclaimer to limit the patent term to that

of U.S. Patent No. 11,294,403. *Id.*

34. On March 17, 2023, the Examiner issued a Notice of Allowability which allowed claims 1, 6-7, 9, 11, 13-14, 17, and 21- 25. *Id.*, at 560-71.

D. Overview of the Prior Art

1. Cardamone (Ex. 1005)

35. U.S. Patent Application No. 2015/0308244 to Cardamone was filed on November 26, 2013, and claims the benefit of Provisional Patent Application No. 61/729,815 filed on November 26, 2012. Cardamone is prior art under pre-AIA § 102(e).

36. Cardamone is directed to a deep well linear motor pump system comprising a pump motor driver system configured to provide drive commands to the pump motor, a surface control computer connected with the motor drive system and configured to control the pump motor, a sensor system communicating with the control computer and configured to sense operating parameters of the pump motor, including the position of the motor shaft and the temperature of the motor. Ex. 1005, Abstract.

2. Khan (Ex. 1006)

37. U.S. Patent No. 7424,399 to Khan was filed on June 9, 2006, and issued on September 9, 2008. Khan claims priority to U.S. Provisional Patent Application Ser. No. 60/689,257, filed Jun. 10, 2005, and entitled Systems And Methods For Fluid Quality Sensing, Data Sharing And Data Visualization. Khan is prior art under

pre-AIA § 102(a).

38. Khan teaches receiving fluid test data generated from multiple different entities and permits authorized users affiliated with the different entities, as well as others, to visualize information associated with that data via the Internet using graphical computer interfaces at respective computers. The fluid test data can be gathered using portable sensor units equipped with GPS and wireless communication to transmit the fluid test data and geographical information to the service provider. Ex. 1006, Abstract.

VI. SUMMARY OF MY OPINIONS

39. Having reviewed the Challenged Patents and the prior art discussed herein, I have formed the following opinions:

- Cardamone Anticipates Claims 1-16, and 20 or would be obvious to a POSITA in view of Cardamone.
- Kahn Anticipates Claims 1, and 17-20 or would be obvious to a POSITA in view of Kahn
- Cardamone or Kahn in view of SCADA renders Claims 2, 8, and 13 obvious to a POSITA

A. Opinions Regarding the '504 Patent

1. **Ground 1: Cardamone Anticipates Claims 1-16, and 20 Or Would Be Obvious To A POSITA In View of Cardamone.**
 - a. **Claim 1**

[1.1] A fluid processing system, comprising:

40. A controller, in a computing context, is a hardware device or a software program that manages or directs the flow of data between two entities. In computing, controllers may be cards, microchips, or separate hardware devices for the control of a peripheral device. In general, a controller can be thought of as something or someone that interfaces between two systems and manages communications between them. See <https://www.techtarget.com/whatis/definition/controller>.

41. Controllers are capable of sending commands, instructions, target values, target states, and more to different components in the well site, including other fluid-handling devices. Controllers can also receive measurement data, commands, instructions, target values, and target states from different fluid-handling devices. Finally, controllers can also make a determination about whether measured values fall within preset parameters. Controllers can also collect data from sensors and fluid-handling devices either by queried sampling to immediately read all enabled digital and analog input pins or automatic sampling to transmit the sensor data periodically or whenever a digital pin changes. See <https://www.techtarget.com/whatis/definition/control-system>.

42. In the context of PID controllers, the setpoint represents the reference or goal for the controlled process variable. It serves as the benchmark against which the actual process variable (PV) is continuously compared. The PID controller

calculates an error signal by taking the difference between the setpoint and the current value of the process variable. The PID controller uses this error signal to determine how to adjust the control output to bring the process variable as close as possible to the setpoint while maintaining stability and minimizing overshoot. See, e.g., <https://ctms.engin.umich.edu/CTMS/index.php?example=Introduction§ion=ControlPID>.

43. A site master controller is a controller that is disposed at a well site to control a device or devices located at the site. See <https://www.techtarget.com/whatis/definition/controller>. A POSITA would understand that more than one site master controller could be disposed of at a well site depending on the physical site layout and the number of devices present. Ex. 1005, ¶ 0042, *see also id.*, ¶¶ 0011, 0021, 0026, 0041.

44. A command, in the context of technology and computing, is an instruction given by a user to a computer or software to perform a specific task. It can be a single word, a line of code, or a series of instructions that tell the computer what to do. See <https://www.lenovo.com/us/en/glossary/command/?orgRef=https%253A%252F%252Fwww.google.com%252F>. A command is a specific action assigned to a program to perform a specific task. It commonly refers to a specific word or phrase that tells the computer what to do through a command line interface or shell,

depending on what kind of system is being used. Programming languages also refer to lines of code that initiate specific processes or statements as commands. <https://www.techopedia.com/definition/3333/command-cmd>.

45. Deep well pumps are designed for use in water supply systems, for pumping and increasing liquid pressures in technological processes, reduction of groundwater level, watering systems, and other industrial and residential applications. See, e.g., Ex. 1005, ¶¶ 0001, 0022; see also *id.*, ¶ 0005 (“downhole pump”).

46. A POSITA would recognize that the deep well linear pump system is a system frequently deployed in the processing of various types of fluids. See, e.g., Ex. 1005, ¶¶ 0001, 0022; see also *id.*, ¶ 0005 (“downhole pump”). Thus, Cardamone discloses this claim element.

[1.2] a first computer system disposed at a first fluid handling site, wherein the first computer system is configured to: receive information comprising one or more properties of a first fluid from one or more sensors disposed at a first fluid tank itself disposed at the first fluid-handling site, the fluid-handling site comprising one or more fluid-handling devices, the one or more fluid-handling devices comprising one or more of a first pump, a first filter, and a first valve; and

47. A POSITA would understand that the control and communication computer system is a first computer and that the pump system includes a pump, valve, and filter. See *supra*, ¶¶ 27-28, 39-44 (above discussion of controllers). It is

well known that a fluid-handling site pumps, filters, and valves. *See, e.g.,* Ex. 1005, ¶ 0024. Thus, Cardamone discloses this claim element.

[1.3] provide a remote control of a first fluid-handling device of the one or more fluid-handling devices; and.

48. A POSITA would recognize from this disclosure that the remote management computer facilitates remote control of fluid handling devices. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); Ex. 1005, ¶¶ 0029-30, 0044-45, 0049. Thus, Cardamone discloses this claim element.

[1.4] a server system wherein the server system has memory storing instructions that, when executed, effectuate operations comprising:

49. A server is a computer or system that provides resources, data, services, or programs to other computers, known as clients, over a network. A command center server is simply a server disposed at a command center or a central place for executing orders and supervising tasks. Common to every command center are three general activities: inputs, processes, and outputs. Computer memory is a device that is used to store data or programs (sequences of instructions) on a temporary or permanent basis for use in an electronic digital computer.

50. A POSITA would understand from Cardamone's disclosure of data storage that the control and communication computer acts as a server system that has storage and stores operational parameters. Ex. 1005, ¶¶ 0021, 0027, 0035, 0048. Thus, Cardamone discloses this claim element.

[1.5] receiving, with the server system, from the first computer system, via a network, a first fluid property of the one or more properties associated with the first fluid sensed by a first sensor of the one or more sensors;

51. A Process Control Network (“PCN”) is a communications network layer that is a part of the Industrial Automation networks in Process Industries. See *supra*, ¶¶ 27-28, 39-44 (above discussion of controllers). This network is used to transmit instructions and data between control and measurement units and Supervisory Control and Data Acquisition (“SCADA”) equipment. See, e.g., <https://www.infosecinstitute.com/resources/scada-ics-security/process-control-network-pcn-evolution/>.

52. A network interface is the point of interconnection between a computer and a private or public network. A network interface is generally a network interface card (“NIC”) but does not have to have a physical form. Instead, the network interface can be implemented in software. <https://docs.oracle.com/javase%2Ftutorial%2F/networking/nifs/definition.html#:~:text=A%20network%20interface%20is%20the,can%20be%20implemented%20in%20software.>

53. A POSITA would understand from Cardamone's disclosure of a data server that receives sensory data logs that the sensory data logs include fluid properties sensed by the sensor. See Ex. 1005, ¶¶ 0029-30, 0044-45. Thus, Cardamone discloses this claim element.

[1.6] obtaining, with the server system, credentials from a first client computing device;

54. It is well known that a server can access user credentials from a client device and Cardamone's disclosures are no exception. Ex. 1005, ¶ 0042. A POSITA would understand from Cardamone's disclosure that querying a user for a username and password is obtaining credentials from a first client computing device.

[1.7] determining, with the server system, based on the credentials, that a user of the first client computing device is authorized to interact with the first fluid handling site, wherein the server system hosts data about other fluid handling sites the user is not authorized to interact;

55. A POSITA would understand that querying a user for a username and password would not only provide information about a fluid-handling device a user is authorized to interact with, querying a user for a username and password would also provide information about a fluid-handling device a user is not authorized to interact with. *See supra*, ¶ 29 (above discussion of credentials); *see also*, Ex. 1005, ¶ 0042. Thus, Cardamone discloses this claim element.

[1.8] after the determination, providing, with the server system, via the network, information by which a first client computing device presents a user interface indicating the first fluid property, the first client computing device being remote from the server system and the first computer system;

56. A GUI is a form of user interface that allows users to interact with electronic devices through graphical icons and visual indicators such as secondary

notation. In many applications, GUIs are used instead of text-based UIs, which are based on typed command labels or text navigation. GUIs were introduced in reaction to the perceived steep learning curve of command-line interfaces (CLIs), which require commands to be typed on a computer keyboard. See <https://www.computerhope.com/jargon/g/gui.htm>, *see also* <https://www.computerhope.com/issues/ch000619.htm>. *See supra*, ¶ 29 (above discussion of client interface); Ex. 1005, ¶ 0035. A GUI is a type of user interface that allows a user to interact with fluid-handling devices via visual indication representatives. It is well known that a GUI is a type of control interface. The GUI computer can be portable or desktop and can access the control computer via the web. Applications on the GUI computer query a user for a username and password which are authenticated by the control computer. The GUI computer permits a user to view sensor data and set operating parameters and algorithms. *See e.g.*, <https://www.ibm.com/docs/en/ioc/5.2.0?topic=source-configuring-display-sensor-data>.

57. A web server is software and hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web. The main job of a web server is to display website content through storing, processing, and delivering web pages to users. Besides HTTP, web servers

also support SMTP (Simple Mail Transfer Protocol) and FTP (File Transfer Protocol), used for email, file transfer, and storage. See Ex. 1005, ¶ 0027.

58. Web server hardware is connected to the internet and allows data to be exchanged with other connected devices, while web server software controls how a user accesses hosted files. The web server process is an example of the client/server model. See <https://www.techtarget.com/whatis/definition/Web-server>.

59. A POSITA would recognize that Cardamone's disclosure of a server computer arranged at a location remote from the oil well is the first client computing device being remote from the server system and the first computer system. Ex. 1005, ¶ 0046. Additionally, a POSITA would recognize that Cardamone's disclosure of web server/web application 136 for providing a client interface for viewing the sensory data logs on remote management computer 138 is the presenting a user interface indicating the first fluid property found in claim of the '504 Patent. Ex. 1005, ¶ 0042, *see also id.*, ¶¶ 0011, 0021, 0026. Thus, Cardamone discloses this claim element.

[1.9] receiving, with the server system, from the first client computing device, a first command to change a state of the first fluid-handling device; and

60. I would recognize that setting operational parameters disclosed in Cardamone is the receiving a first command to change the state of the first fluid-handling device in Claim 1 of the '504 Patent. Ex. 1005, ¶¶ 0044-45, *see also*

id., ¶ 0026 (“software application (131) for allowing a user (101) to view sensor data, and view and set control computer operating parameters and algorithms”).

Thus, Cardamone discloses this claim element.

[1.10] causing, with the server system, the first computer system disposed at the first fluid handling site to effectuate the command by changing the state of the first fluid-handling device to a sequence of different target states that change over time.

61. A target state is the particular operating condition that a device is in at a particular time. *See supra*, ¶ 41 (above discussion of controllers ability to control fluid-handling devices). Determining the target state of the fluid-handling devices is necessary to understand whether a fluid-handling device is operating within the proper device parameters or whether the operating condition of the fluid-handling device should be changed. It is well known in certain device configurations at fluid handling sites that fluid handling devices will continue to operate based on the last received commands in the event a connection to the server is lost. Ex. 1005, ¶ 0009; *see also id.*, Claims 11.

62. A POSITA would understand that the causing, with the server system, the first computer system disposed at the first fluid handling site to effectuate the command by changing the state of the first fluid-handling device to a sequence of different target states that change over time is provided by Cardamone in its disclosure of control computer is programmed to provide an output command as a

function of one or more of said operating parameters (i.e. different target states) from said sensor system. Ex. 1005, ¶ 0042, *see also id.*, ¶¶ 0011, 0021, 0026, 0041, FIG. 1. Cardamone discloses this claim element. Thus, Cardamone anticipates claim 1 or would be obvious to a POSITA in view of Cardamone.

b. Claim 2

[2] The system of claim 1, wherein: the sequence of different target states that change over time are configured to ramp up or down a speed of the first fluid-handling device.

63. A POSITA would understand that the adjusting pump operation is the ramping up or down of the fluid handling device disclosed in Claim 2 of the '504 Patent. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); Ex. 1005, ¶ 0009; *see also id.*, Claims 11. Thus, Cardamone anticipates claim 2 or would be obvious to a POSITA in view of Cardamone.

c. Claim 3

[3] The system of claim 1, wherein: the sequence of different target states that change over time are determined with steps for mitigating shocks to up-stream or down-stream fluid-handling devices relative to the first fluid-handling device

64. A POSITA would understand the system of Claim 3, wherein the sequence of different target states that change over time are determined with steps for mitigating shocks to up-stream or down-stream fluid-handling devices relative to the first fluid-handling device is provided by Cardamone in its disclosure of adjusting pump operation and providing an output command as a function of one or

more of said operating parameters. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); Ex. 1005, ¶¶ 0009, 0035-0036. Thus, Cardamone anticipates claim 3 or would be obvious to a POSITA in view of Cardamone.

d. Claim 4

[4] The system of claim 1, wherein: at least some of the sequence of different target states that change over time are determined by the first computer system in response to a rate of change in the first fluid property, wherein the first fluid property corresponds to a level of the first fluid in the first tank.

65. Cardamone discloses the determining of different target states of a given one of the fluid-handling devices over time. Ex. 1005, ¶¶ 0009, 0021, 0022, 0025, 0026, 0029, 0036; *see supra*, ¶¶ 27-28, 39-44 (above discussion of controllers).

66. A POSITA would understand that at least some of the sequences of different target states that change over time are determined by the first computer system in response to a rate of change in the first fluid property, wherein the first fluid property corresponds to a level of the first fluid in the first tank is provided by Cardamone in its disclosure of the motor drive command is a function of a change in pressure sensed by said pump inlet pressure sensor. Ex. 1005, Claim 13. Thus, Cardamone anticipates claim 4 or would be obvious to a POSITA in view of Cardamone.

e. Claim 5

[5] The system of claim 1, wherein: the server system is configured to interface with both a web browser on the client computing device and a special-purpose application executing on the client computing device to present the user interface indicating the first fluid property, wherein the first fluid property corresponds to a first fluid level.

67. A web browser is a software program that allows a user to locate, access, and display web pages. In common usage, a web browser is usually shortened to “browser.” <https://www.techopedia.com/definition/288/web-browser>. Special purpose application software is a type of software created to execute one specific task.

68. A POSITA would understand that the server system is configured to interface with both a web browser on the client computing device and a special-purpose application executing on the client computing device to present the user interface indicating the first fluid property, wherein the first fluid property corresponds to a first fluid level is provided by Cardamone in its disclosure of the GUI Computer 130, which contains a web browser and the web application 134 which provides an interface to remote management computer 138 to provide fluid properties. Ex. 1005, ¶ 0021. Thus, Cardamone anticipates claim 5 or would be obvious to a POSITA in view of Cardamone.

f. Claim 6

[6] The system of claim 1, wherein: the first computer system is configured to communicate with the server system via a cellular wireless connection.

69. Cardamone discloses that data server 134 is connected to network 132, linked to control and communication computer 126 through communication links to include cellular data connections. Ex. 1005, ¶ 0027. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers).

70. A POSITA would understand that communicating with the server system via a cellular wireless connection is provided by Cardamone in its disclosure of the communication link including cellular data connections. Ex. 1005, ¶ 0027. Thus, Cardamone anticipates Claim 6 or would be obvious to a POSITA in view of Cardamone.

g. Claim 7

[7] The system of claim 1, wherein the first computer system is configured to translate a plurality of commands from the server system, including the command, from an input format to a plurality of different formats and protocols configured to effectuate changes in states of a plurality of different fluid-handling devices at the first fluid handling site.

71. A protocol translator is often disposed at the well site to translate protocols and commands. Protocol translation is a method for transforming pieces of information from a source protocol into relevant target protocol formats in order to communicate between heterogeneous legacy systems in interoperability

environments, such as fluid-handling sites.

<https://www.sciencedirect.com/science/article/abs/pii/S0164121212001720#:~:text=Protocol%20translation%20is%20a%20method,legacy%20systems%20in%20interoperability%20environments>. A protocol translator is a device used to convert standard or proprietary protocol of one device to the protocol suitable for the other device or tools to achieve the desired interoperability. Protocols are software installed on the routers, which convert the data formats, data rate, and protocols of one network into the protocols of the network in which data is navigating. See *e.g.*, Ex. 1005, ¶¶ 0007, 0030-31. There are varieties of protocols used in different fields like power generation, transmission and distribution, oil and gas, automation, utilities, and remote monitoring applications. The major protocol translation messages involve the conversion of data messages, events, commands, and time synchronization. Protocol converters are generally used for transforming data and commands from one device or application to another. This necessarily involves the transformation of data, commands, their representation, encoding, and framing to achieve the conversion. See <https://www.trendmicro.com/vinfo/hk-en/security/definition/protocol-gateway>.

72. Translation of protocols is required to support communication between different fluid-handling devices, controllers, IPCs, etc. I understand that the claimed translation of protocols is required to permit the data interface and bus to operate

and communicate with various types of devices using multiple different types of protocols. <https://www.trendmicro.com/vinfo/hk-en/security/definition/protocol-gateway> Protocol translation allows devices running dissimilar protocols to communicate. The translation of virtual terminal protocols allows connectivity to devices running different protocol stacks.

73. A POSITA would understand that the claimed translation of protocols is required to permit the data interface and bus to operate and communicate with various types of devices using multiple different types of protocols. Ex. 1005, ¶ 0031. Thus, Cardamone discloses translating the plurality of commands into translated commands encoded in a plurality of protocols different from the first protocol.

74. A POSITA would recognize that the disclosure from Cardamone is a plurality of different formats and protocols. Ex. 1005, ¶ 0031. A POSITA would further understand that the control computer being programmed to provide an output command as a function of one or more of said operating parameters from said sensor system is a command (sent in one of the aforementioned formats or protocols) means that the first computer system is configured to translate a plurality of commands from the server system, including the command, from an input format to a plurality of different formats and protocols configured to effectuate changes in states of a plurality of different fluid-handling devices at the first fluid handling site. Ex. 1005,

Claim 4. Thus, Cardamone anticipates Claim 7 or would be obvious to a POSITA in view of Cardamone.

h. Claim 8

[8] The system of claim 7, wherein translating the plurality of commands comprises steps for translating commands.

75. A POSITA would recognize that the above disclosure of a plurality of different formats and protocols that translation of the protocols is necessary in order for the fluid-handling devices to communicate with the controller. *See supra*, ¶¶ 71-74 (above discussion of translating commands); Ex. 1005, ¶ 0030-31. Thus, Cardamone anticipates claim 8 or would be obvious to a POSITA in view of Cardamone.

i. Claim 9

[9] The system of claim 7, wherein the plurality of different formats and protocols comprise: modbus remote terminal unit protocol; and analog electrical signals

76. A POSITA would recognize from Cardamone's disclosure that Bus 326 has multiple protocols implemented including DeviceNet, RS485, F-NET, Modbus, FireWire, CANopen, Ethernet IP, ProfiNet, and SERCOS. *See supra*, ¶¶ 71-74 (above discussion of translating commands); Ex. 1005, ¶ 0007. Cardamone further discloses that the data interface may be implemented using alternative protocols for either analog or digital signal transfer. Ex, 1005, ¶ 0030. Thus, Cardamone

anticipates claim 9 or would be obvious to a POSITA in view of Cardamone.

j. Claim 10

[10] The system of claim 7, wherein at least some of the plurality of different fluid-handling devices comprise proportional-integral-derivative controllers configured to drive respective fluid-handling devices to different target setpoints determined by the first computer system responsive to corresponding commands from the server system.

77. See *supra*, ¶¶ 41-44 (above discussion of target states, controllers, and proportional integral-derivative controllers). Ex. 1005, ¶ 0009; see also *id.*, Claims 11.

78. A POSITA would further understand that a proportional–integral–derivative controller is a control loop mechanism employing feedback that is widely used in industrial control systems and a variety of other applications requiring continuously modulated control. A PID controller continuously calculates an error value $e(t)$ as the difference between a desired setpoint (SP) and a measured process variable (PV) and applies a correction based on proportional, integral, and derivative terms. Ex. 1005, ¶¶ 0036, 0043. Thus, Cardamone anticipates claim 10 or would be obvious to a POSITA in view of Cardamone.

k. Claim 11

[11] The system of claim 7, wherein: the first computer system is coupled to at least some of the plurality of different fluid-handling devices via a bus; and

79. A POSITA would understand that Cardamone discloses the first computer system is coupled to at least some of the plurality of different fluid-handling devices via a bus through its disclosure that the motor drive unit 318 interfaces with control and communication computer 126 over digital interface bus 326. *See supra*, ¶¶ 41-44 (above discussion of target states, controllers, and proportional integral-derivative controllers). Sensory data from lines 237 and 239 is relayed to computer 126 over bus 326. Bus 326 is also used by computer 126 to relay drive commands to motor drive unit 318. Bus 326 has multiple protocols implemented including DeviceNet, RS485, F-NET, Modbus, FireWire, CANopen, Ethernet IP, ProfiNet, and SERCOS. Ex. 1005, ¶ 0031. Thus, Cardamone discloses this claim element.

[11.2] the first computer system comprises means for controlling which fluid-handling devices are permitted to transmit signals on the bus at a given point in time.

80. A POSITA would understand that transmission of sensory data is permitted at a given point in time. *See supra*, ¶¶ 41-44 (above discussion of target states, controllers, and proportional integral-derivative controllers); Ex. 1005, ¶ 0031. Thus, Cardamone anticipates claim 11 or would be obvious to a POSITA in view of Cardamone.

l. Claim 12

[12] The system of claim 7, wherein at least some of the plurality of different fluid-handling devices comprise proportional-integral-derivative controllers configured to drive respective fluid-handling devices to different target setpoints determined by the first computer system responsive to corresponding commands from the server system.

81. A POSITA would recognize from the disclosure in Cardamone that it discloses a proportional-integral-derivative controller that is configured to drive fluid-handling devices to different set points determined by a first computer system. *See supra*, ¶¶ 41-44 (above discussion of target states, controllers, and proportional integral-derivative controllers); Ex. 1005, ¶ 0031. Thus, Cardamone anticipates claim 12 or would be obvious to a POSITA in view of Cardamone.

m. Claim 13

[13] The system of claim 7, wherein the plurality of different formats and protocols comprise command code format, an on-off signal format, and an application-program interface format.

82. A POSITA would recognize that the formats and protocols include command code format, an on-off signal format, and an application-program interface format. Ex. 1005, ¶ 0031. Thus, Cardamone anticipates claim 13 or would be obvious to a POSITA in view of Cardamone.

n. Claim 14

[14] The system of claim 7, wherein the first computer system is configurable to operate in an automatic mode, a mixed automatic mode, and a manual mode.

83. In automatic mode, a device shall be controlled entirely by the control system. Starting and stopping pumps or closing and opening valves shall be performed automatically and in accordance with the relevant sequence- and control algorithms. The operator shall not have the capability to issue a command individually to a device while it is in automatic mode. However, the current status of the device shall be monitored and indicated on the display devices of the SCADA system. See, e.g., <https://hansaconsult.com/control/modes-of-operation/#:~:text=In%20the%20manual%20mode%2C%20a,limits%20the%20extent%20of%20operations>. In manual mode, a device shall be operated by issuing commands from the operating console of the SCADA system utilizing dialogue boxes, buttons, and other appropriate tools. The level of authorization identified by log-in-code limits the extent of operations. Only operators logged in with a sufficient level of authorization shall be allowed to perform particular operations. Safety interlocks associated with such operations shall be activated and executed within the second (PLC) layer of the control system. See, e.g., <https://hansaconsult.com/control/modes-of-operation/#:~:text=In%20the%20manual%20mode%2C%20a,limits%20the%20extent%20of%20operations>.

ent%20of%20operations.

84. A POSITA would understand the automatic adjustment of the movement profile is operating in an automatic mode. Ex. 1005, ¶ 0045. A POSITA would further understand that if the computer system can operate in an automatic mode, it can also operate in a manual mode or a combination of both automatic and manual modes. Ex. 1005, ¶ 0045; *see also id.*, ¶¶ 0051-0052. Thus, Cardamone anticipates claim 14 or would be obvious to a POSITA in view of Cardamone.

o. Claim 15

[15] The system of claim 7, wherein translating the plurality of commands comprises steps for identifying protocols and control busses.

85. A POSITA would recognize from the above disclosure of a plurality of different formats and protocols that identification of the protocol is necessary in order to translate the protocol so that the fluid-handling devices can communicate with the controller. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers). ; Ex. 1005, ¶¶ 0030-31. Thus, Cardamone anticipates claim 15 or would be obvious to a POSITA in view of Cardamone.

p. Claim 16

[16] The system of claim 1 wherein the first computing system is configured to receive and transmit data and commands via a remote terminal unit protocol wherein the data and commands comprise redundant bits.

86. A POSITA would understand that in order to protect these data transmissions, redundant bits are needed. See *supra*, ¶¶ 27-28, 39-44 (above discussion of controllers). Redundant bits are extra binary bits added externally into the original data bit to prevent damage to the transmitted data and are also needed to recover the original data. Ex. 1005, ¶¶ 0031, 0042. Thus, Cardamone anticipates claim 16 or would be obvious to a POSITA in view of Cardamone.

q. Claim 20

87. Cardamone discloses each and every limitation of claim 20, anticipating claim 20. Claim 20's preamble is non-limiting. Claim 20's limitation 20.2 is analogous to limitation 1.2, limitation 20.3 is analogous to limitation 1.2, limitation 20.4 is analogous to limitation 1.2, limitation 20.5 is analogous to limitation 1.5, limitation 20.6 is analogous to limitation 1.6, limitation 20.7 is analogous to limitation 1.7, limitation 20.8 is analogous to limitation 1.8, limitation 20.9 is analogous to limitation 1.9, and limitation 20.10 is analogous to limitation 1.10. Each of Claim 20's limitations is disclosed by Cardamone for reasons provided above and incorporated here. *Supra*, section VI(A)(2)(a). Cardamone anticipates Claim 20 or would be obvious to a POSITA in view of Cardamone.

2. **Ground 2: Kahn Anticipates Claims 1, and 17-20 Or Would Be Obvious To A POSITA In View Of Kahn.**

a. **Claim 1**

[1.1] A fluid processing system, comprising:

88. A POSITA would recognize that the system for fluid sensing, quality sensing, data sharing, and data visualization is a system frequently deployed in the processing of various types of fluids. Ex. 1006, 4:12-17. Thus, Kahn discloses this claim element.

[1.2] a first computer system disposed at a first fluid handling site, wherein the first computer system is configured to: receive information comprising one or more properties of a first fluid from one or more sensors disposed at a first fluid tank itself disposed at the first fluid-handling site, the fluid-handling site comprising one or more fluid-handling devices, the one or more fluid-handling devices comprising one or more of a first pump, a first filter, and a first valve; and

89. A POSITA would understand that Kahn discloses receiving information comprising fluid properties from one or more sensors disposed at a first fluid-handling site, the fluid-handling site through its disclosure of a computer system that receives first fluid test data from sensors. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers).

90. A POSITA would also understand that Kahn discloses one or more fluid-handling devices through its disclosures of multiple filters/ filter housing as shown in FIG. 1G and a valve located on the input side of a sensor unit 110. Ex.

1006, 4:12-25, 11:2-15.

91. Finally, A POSITA would understand that the system disclosed in Kahn necessarily includes a tank through its disclosure of distribution systems that include reservoirs, water treatment plants (a treated water tank is used as part of the water supply system to provide a reserve of drinking water storage in the event of planned maintenance or supply or treatment problems) and contain water, all of which includes tanks. Ex. 1006, 1:46-50, 2:1, 4:12-32. Thus Kahn discloses this claim element.

[1.3] provide remote control of a first fluid-handling device of the one or more fluid-handling devices; and

92. Controllers are used in remote oil fields and fluid-handling management systems to control fluid-handling devices such as pumps, valves, filters, tanks, motor drive systems, and pump systems including actuators. See, e.g., Ex. 1006, 8:19-21, 10:62-67; see also *id.*, 14:35-15:2, 15:62-16:32. A POSITA would understand from Kahn that it discloses remote control of a first fluid-handling device of the one or more fluid-handling devices. Thus, Kahn discloses this claim element.

[1.4] a server system wherein the server system has memory storing instructions that, when executed, effectuate operations comprising:

93. Process sensors come in many forms. In addition to temperature sensors, pressure sensors, level sensors, and flow sensors (more often called

flowmeters), process sensors are used in many applications and are designed to take accurate measurements of the process. Computer memory is a device that is used to store data or programs (sequences of instructions) on a temporary or permanent basis for use in an electronic digital computer. See <https://www.controleng.com/articles/process-control-sensor-types-and-applications/>. See, e.g., Ex. 1006, 8:51-59, 9:53-58, 17:18-30, 18:48-52, 63-65, 19:5-23, 19:58-65, 23:27-31.

94. A POSITA would understand from the above disclosure of a central communication device, e.g., a server that Kahn discloses a server system wherein the server system has memory storing instructions. Thus, Kahn discloses this claim element.

[1.5] receiving, with the server system, from the first computer system, via a network, a first fluid property of the one or more properties associated with the first fluid sensed by a first sensor of the one or more sensors;

95. A POSITA would understand from the above disclosure and figure that Kahn discloses receiving, with the server system, from the first computer system, via a network, a first fluid property of the one or more properties associated with the first fluid sensed by a first sensor of the one or more sensors. See *supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); see, e.g., Ex. 1006, 5:62-6:2, 9:37-43, 10:18-67, 13:46-52, 17:18-30, 18:40-19:2, 19:5-20:39, 22:12-20, 23:22-50, FIG. 1A, FIG. 3. Thus, Kahn discloses this claim element.

[1.6] obtaining, with the server system, credentials from a first client computing device;

96. A POSITA would recognize from its disclosure that any suitable technique can be used to verify that the identity of a present user is an authorized user of the device. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers). Kahn further discloses that an authorized Account A (first user 5 a) can be authorized by a first entity. Ex. 1006, 25:55-58. Finally, Kahn discloses that an authorized Account B (second user 5 b) second user can be authorized by a second entity. Ex. 1006, 25:55-58. A POSITA would understand that Kahn discloses that credentials can be obtained from a first client computer. Thus, Kahn discloses this claim element.

[1.7] determining, with the server system, based on the credentials, that a user of the first client computing device is authorized to interact with the first fluid handling site, wherein the server system hosts data about other fluid handling sites the user is not authorized to interact;

97. A POSITA would recognize from the above disclosure that Kahn discloses determining, with the server system, based on the credentials, that a user of the first client computing device is authorized to interact with the first fluid handling site, wherein the server system hosts data about other fluid handling sites the user is not authorized to interact. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); *see, e.g.*, Ex. 1006, 25:55-58. Thus, Kahn discloses this claim element.

[1.8] after the determination, providing, with the server system, via the network, information by which a first client computing device presents a user interface indicating the first fluid property, the first client computing device being remote from the server system and the first computer system;

98. A POSITA would recognize from claim 36, that Kahn discloses a providing, with the server system, via the network, information by which a first client computing device presents a user interface indicating the first fluid property, the first client computing device being remote from the server system and the first computer system. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); Ex. 1006, 2:50-54, 2:61-65, 25:5-12, 26:3-7, Claim 36, FIG. 5, FIG. 6. Thus, Kahn discloses this claim element.

[1.9] receiving, with the server system, from the first client computing device, a first command to change a state of the first fluid-handling device; and

99. A POSITA would recognize from the above disclosure that Kahn discloses receiving, with the server system, from the first client computing device, a first command to change a state of the first fluid-handling device. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); *see, e.g.*, Ex. 1006, 8:3-11, 8:21-24, 10:62-67; *see also* Ex. 1006, 14:35-15:2, 15:62-16:32, 34:7-12. Thus, Kahn discloses this claim element.

[1.10] causing, with the server system, the first computer system disposed at the first fluid handling site to effectuate the command by changing the state of the first fluid-handling device to a sequence of different target states that change over time.

100. A POSITA would recognize from the above disclosure that Kahn discloses receiving, with the server system, from the first client computing device, a first command to change a state of the first fluid-handling device. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); *see, e.g.*, Ex. 1006, 8:3-11, 8:21-24, 10:62-67; *see also* Ex. 1006, 14:35-15:2, 15:62-16:32, 34:7-12. Kahn discloses this claim element. Thus, Kahn anticipates claim 1 of the ‘504 Patent or would be obvious to a POSITA in view of Kahn.

b. Claim 17

[17.1] The system of claim 1, wherein the system further comprises: a plurality of fluids, the plurality of fluids comprising a second fluid;

101. A POSITA would understand that Kahn discloses a plurality of fluids comprising a second fluid through its disclosure of measurements of water and other fluids. Ex. 1006, 3:63-65, 5:1-3, 17:67-18:2 (“other fluids, such as natural gas”). Thus, Kahn discloses this claim element.

[17.2] a plurality of computer systems disposed at a plurality of fluid-handling sites, the plurality of computer systems comprising a second computer system;

102. A POSITA would understand that Kahn discloses a plurality of fluids comprising a second fluid through its disclosure of measurements of water and other fluids. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); Ex. 1006, 33:40-43.; *id.* 25:48-26:2, Claim 1. Thus, Kahn discloses this claim element.

[17.3] a plurality of fluid tanks, the plurality of fluid tanks comprising a second fluid tank; and

103. A POSITA would understand that Kahn discloses a plurality of fluid-handling devices including a second tank through its disclosure of treatment systems that can include multiple tanks. Ex. 1006, 4:12:-25. Thus, Kahn discloses this claim element.

[17.4] a plurality of fluid-handling devices, the plurality of fluid-handling devices comprising a second fluid-handling device.

104. A POSITA would understand from the above disclosure that Kahn discloses a plurality of fluid-handling devices, the plurality of fluid-handling devices comprising a second fluid-handling device. Ex. 1006, 10:8-13. Kahn discloses this claim element. Thus, Kahn anticipates claim 17 or would be obvious to a POSITA in view of Kahn.

c. Claim 18

[18.1] The system of claim 17, wherein: the first computer system, the first fluid-handling device and the first fluid tank are disposed at a water source;

105. The “Distribution system” of Kahn includes any system of fluid distribution (including air distribution systems such as, for example, air ducts), which in the case of water distribution, currently commonly manifest themselves as contiguous systems of pipes and/or systems of reservoirs, channels, pipes, and treatment plants, but also can include less typical distribution channels such as container water, well water within a watershed or a water table, and even large bodies of water, oceans, rivers, streams and/or tributaries, or virtually anything wherein fluid can flow from one point in the system to another, such as movement of water from one layer to another layer within a single body of water, a hallmark of which is the ability to identify the location of and communicate with sensor units within the water distribution system. *See, e.g.*, Ex. 1006, 5:62-6:2, 9:37-43, 10:18-67, 13:46-52, 17:18-30, 18:40-19:2, 19:5-20:39, 22:12-20, 23:22-50, FIG. 1A, FIG. 3.

106. A POSITA would understand from the above disclosure in Kahn that the first fluid tank is disposed at a water source. *See, e.g.*, Ex. 1006, 5:62-6:2, 9:37-43, 10:18-67, 13:46-52, 17:18-30, 18:40-19:2, 19:5-20:39, 22:12-20, 23:22-50, FIG. 1A, FIG. 3. Thus, Kahn discloses this claim element.

[18.2] the second computer system, the second fluid-handling device, and the second fluid tank are disposed at a water receptacle; and

107. A POSITA would understand from the distribution system disclosure in Kahn that the treatment plants have multiple tanks including a second fluid tank disposed at a water receptacle (pipes and/or systems of reservoir channels, pipes, and treatment plants). Ex. 1006, 4:12-17. Thus, Kahn discloses this claim element.

[18.3] each of the first fluid and the second fluid comprises water.

108. A POSITA would understand from the above disclosure in Kahn that the first and second fluids comprise water. Ex. 1006, 4:18-20. Kahn discloses this claim element. Thus, Kahn anticipates claim 18 or would be obvious to a POSITA in view of Kahn.

d. Claim 19

[19.1] The system of claim 18, wherein: the plurality of fluids further comprising a third fluid;

109. A POSITA would understand that Kahn discloses a plurality of fluids comprising a third fluid through its disclosure of measurements of water and other fluids. Ex. 1006, 3:63-65, 5:1-3, 17:67-18:2 (“other fluids, such as natural gas”). Thus, Kahn discloses this claim element.

[19.2] the plurality of computer systems further comprises a third computer system; and

110. A POSITA would understand that Kahn discloses a plurality of computer systems comprising a second computer from its disclosure of multiple computers. *See supra*, ¶¶ 27-28, 39-44 (above discussion of controllers); Ex. 1006, 33:40-42. Thus, Kahn discloses this claim element.

[19.3] the plurality of fluid-handling devices further comprises a third fluid-handling device comprising a process filter, wherein the third fluid-handling device is disposed down-stream of a fourth fluid-handling device and upstream of a fifth fluid handling device, receives from the fourth fluid-handling device the third-fluid, and is configurable to provide a fourth fluid to the fifth fluid-handling device.

111. A POSITA would also understand from the above disclosure that Kahn discloses a third fluid-handling device comprising a process filter, wherein the third fluid-handling device is disposed down-stream of a fourth fluid-handling device and upstream of a fifth fluid handling device, receives from the fourth fluid-handling device the third-fluid, and is configurable to provide a fourth fluid to the fifth fluid-handling device. Ex. 1006, 11:22-27; Ex. 1006, 12:58-61. Kahn discloses this claim element. Thus, Kahn anticipates claim 19 or would be obvious to a POSITA in view of Kahn.

e. Claim 20

112. Claim 20's limitation 20.2 is analogous to limitation 1.2, limitation 20.3

is analogous to limitation 1.2, limitation 20.4 is analogous to limitation 1.2, limitation 20.5 is analogous to limitation 1.5, limitation 20.6 is analogous to limitation 1.6, limitation 20.7 is analogous to limitation 1.7, limitation 20.8 is analogous to limitation 1.8, limitation 20.9 is analogous to limitation 1.9, and limitation 20.10 is analogous to limitation 1.10. Each of Claim 20's limitations is disclosed by Kahn for reasons provided above and incorporated here. *Supra* section VI(A)(2)(a). Kahn anticipates Claim 20 or would be obvious to a POSITA in view of Kahn.

3. Ground 3: Cardamone or Kahn In View of SCADA Renders Claims 2, 8, 13, and 14 Obvious.

113. The combination of Cardamone or Kahn with SCADA was obvious because each reference describes a similar system for remote monitoring and control of fluid handling facilities. A POSITA would have referred to Cardamone for its description of a general fluid extraction and distribution system. Likewise, a POSITA would have referred to Kahn for its description of a general fluid distribution system with multiple users and facilities with designated levels of secure access. A POSITA would have referred to SCADA for its description of a specific remote monitoring and control system used in the oil and gas industry.

114. A POSITA would readily recognize that the recited controlling of machine speed by the controller and the recited using the pulse control method to a stepper motor to be incremented or decremented by a specified number of steps from

the disclosure of SCADA is the sequence of different target states that change over time configured to ramp up or down a speed of the first fluid-handling device. A POSITA would recognize that the incrementing or decrementing of the stepper motor is ramping up or down of speed, i.e. a target state, of the first fluid-handling device.

115. As described above, and incorporated by reference herein, a POSITA would be motivated to combine the disclosures of Cardamone and Kahn and SCADA for Claim 2. A POSITA would recognize that SCADA provides specific details of fluid processing systems and remote control of fluid handling devices of Cardamone and Kahn to process instrumentation, various communication methods, and computer applications.

a. Claim 2

116. A POSITA would readily recognize that the recited controlling of machine speed by the controller and the recited using the pulse control method to a stepper motor to be incremented or decremented by a specified number of steps from the disclosure of SCADA is the sequence of different target states that change over time configured to ramp up or down a speed of the first fluid-handling device. Ex. 1007, at 100-01.

b. Claim 8

117. Cardamone or Kahn in view of SCADA renders claim 8 obvious.

Cardamone discloses Claim 8 for the reasons discussed above, and incorporated herein. A POSITA would understand that the use of different protocols by the protocol driver requires that the protocols be translated (i.e., from electrical signals to control signals) and that the translated instructions include the determined plurality of different target states as claimed in the '504 Patent. Thus, SCADA discloses this claim limitation.

118. A POSITA would be motivated to combine the disclosures of Cardamone and Kahn and SCADA for Claim 8. A POSITA would recognize that SCADA provides specific details of fluid processing systems and remote control of fluid handing devices of Cardamone and Kahn to process instrumentation, various communication methods, and computer applications.

c. Claim 13

119. A POSITA would readily recognize that the recited plurality of different formats and protocols comprise command code format, an on-off signal format, and an application-program interface format are disclosed by SCADA in its disclosure of the pulse control method, which allows a stepper motor to be incremented or decremented by a specific number of steps which is an on-off signal format. A POSITA would be motivated to combine Cardamone and Kahan and SCADA's disclosures for Claim 13. SCADA provides specific details of fluid processing systems.

120. Thus, SCADA in combination with Cardamone or Kahn renders obvious the plurality of different formats and protocols comprise command code format, an on-off signal format, and an application-program interface format recited in the '504 Patent.

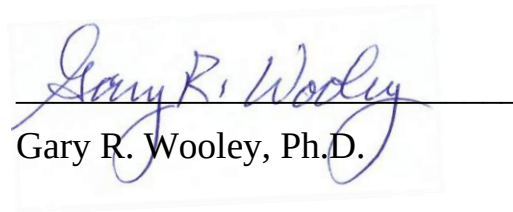
VII. CONCLUSION

121. For the reasons set forth above, in my opinion, all of the limitations of claims 1-20 of the '504 Patent are rendered unpatentable as anticipated or obvious by the above-cited prior art.

VIII. OATH

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 are so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the results of these proceedings.

Dated: February 27, 2025



Gary R. Wooley, Ph.D.