UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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PERMIAN GLOBAL INC., AND
MANTICORE FUELS, LLC
Petitioners

v.

FUEL AUTOMATION STATION, LLC,
Patent Owner

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Case No. IPR2023-01237
Patent 9,586,805

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# DECLARATION OF DR. ROBERT DURHAM IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,586,805

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I, Robert A. Durham, Ph.D., hereby declare as follows:

## I. INTRODUCTION

1. My name is Dr. Robert A. Durham. I make this declaration based upon my own personal knowledge and, if called upon to testify, would testify competently to the matters contained herein.

2. I have been asked to provide technical assistance in the inter partes review of U.S. Patent No. 9,586,805, which I may abbreviate as "the '805 Patent" or refer to as the "Challenged Patent." This declaration is a statement of my opinions on issues related to the unpatentability of claims of the '805 Patent. I am being compensated at my normal hourly rate for my analysis, plus reimbursement for expenses. My compensation does not depend on the content of my opinions or the outcome of this proceeding.

## II. EXPERIENCE AND QUALIFICATIONS

3. In formulating my opinions, I have relied upon my knowledge, training, and experience in the relevant art. My qualifications are stated more fully in my curriculum vitae, which has been provided as EX1002 and Appendix A. My CV also lists publications on which I am a named author and identifies parties on behalf of whom I have previously provided expert testimony within the past four years. Here, I provide a summary of my qualifications.

4. I am a consulting engineer with experience in several technical areas. I have expertise in the electrification of the oil and gas industry from drilling and completion to downstream. I have been working with oil field production companies, refining and chemical plants and equipment manufacturers and technology development companies, as a consultant, for nearly twenty years. My work relates to the subject matter of the Challenged Patent, which I describe below in Section VII ("Overview of the Challenged Patent").

5. I received my Bachelor of Science in Electrical Engineering and Master of Engineering and Technology Management degrees, from the University of Tulsa in 1992 and 1997, respectively. After years of professional work and research I received my Ph.D. in Engineering Management from Kennedy Western University in 2004.

6. I have also served in positions of leadership in the Petroleum and Chemical Industry Committee (PCIC) of the Institute of Electrical and Electronics Engineers (IEEE) for nearly twenty years. IEEE is the world's largest technical professional association. The PCIC is the premier forum for the exchange of electrical applications technology related to the petroleum and chemical industry. From 2005 – 2012, I served as secretary, then vice chair and then ultimately chair of the Production Subcommittee of the PCIC. The Production Subcommittee is the primary method for PCIC members to communicate technical papers related to

drilling, well head and facilities operations of oil and gas wells. In 2013, I was appointed as Vice-Chair of the Standards Subcommittee of the PCIC, a role which transitioned to Chair in 2014. I served as chair until 2022, at which time I transitioned to an executive role in the PCIC. The Standards subcommittee of the PCIC is the Sponsor of IEEE standards relating to electrification and electrical equipment operations in the Oil and Gas Industry. The PCIC Standards Subcommittees sponsors nearly 50 electrical and oil and gas related standards.

7. My peers have recognized my contributions, particularly in the area of electrical equipment in the oil and gas industry. Because of this recognition, in 2019 I was elevated to the grade of Fellow of the IEEE for "contributions to submersible electrical equipment analysis and multi-point ground methods in hazardous petroleum and chemical environments." The IEEE Fellow grade is limited to the top 0.1% of the membership of IEEE worldwide.

8. I have worked directly in the area of electrification of oil and gas fields both as an employee and as a consulting engineer. From 2000 until the end of 2002, I was employed as Manager of Electric Infrastructure for New Dominion, LLC (NDL). In that capacity I administratively owned and was responsible for all electrical equipment including overhead power lines, transformers, switchgear, drives and motors throughout NDL's production, exploration, and drilling areas.

9. After a brief stint as Vice President for EDG Power Group, responsible for Engineering and Project Management of generation and co-generation facilities across the U.S., I transitioned to the role of consulting engineer. In that role I have served as consulting engineer relating to the design, construction and analysis of all kinds of power systems, especially those in the oil and gas industry. This has included not only design and selection of equipment but also analysis of failures of equipment in the oil and gas field from drilling/completion sites to production facilities, midstream and downstream (refinery) locations.

10. In addition, I am a principal of PEDOCS, Inc., an oil and gas production company operating over 50 oil and gas production wells in Oklahoma. As such, I am familiar with operations of oil and gas wells including well stimulation, completion, hydraulic fracturing, and production.

11. I have been familiar with oil and gas drilling, fracturing (fracking) and completion operations for over twenty years. In addition to being responsible for interfacing with drilling and fracturing operations with regards to electrical needs as an employee of New Dominion, LLC, I have been further educated about drilling, fracturing and operations as I have consulted and investigated incidents on multiple well drilling, fracturing and completion pad sites over my engineering consulting engagements.

12. I have been familiar with power distribution, including generation transmission and distribution equipment. As an employee I worked as a design and construction engineer for generation facilities for Central and Southwest (now American Electric Power AEP). I was also responsible for design and construction of generation facilities when employed by EDG Power Group, as discussed above. While at AEP, I spent three years as a transmission planner, responsible for modeling transmission systems and developing plans for increased power distribution capacities at high voltages. While at New Dominion LLC, I owned and was responsible for design, construction, and maintenance of several hundred miles of medium voltage (5 – 25 kV) distribution lines, switchgear, drives, and motors used for oil and gas drilling, completion, and production. Over the last ~ 20 years I have consulted with numerous clients ranging from utilities to oil and gas development and production companies on the design, upgrades and maintenance of generation and power distribution facilities.

13. I have been familiar with Occupational Safety and Health Administration ("OSHA") and its responsibilities at oil and gas locations. I have consulted and investigated incidents on multiple oil and gas sites where OSHA has also performed investigations regarding injuries and fatalities that have occurred at oil and gas locations, including drilling, fracturing and completion operations. As Principal Scientist of THEWAY Labs, part of my responsibilities includes

overseeing the Health Safety and Environmental (HSE) program at THEWAY Labs, including establishing policies and procedures commensurate with OSHA requirements at all locations, including requirement for oil and gas sites.

14. I am the author or co-author of over fifty published papers and five books. A list of publications that I have authored over the last thirty years is included in my professional CV, which is attached as EX1002 and Appendix A.

15. Therefore, based on my education, professional experience of 30 years, and scholarly books and publications, I am an expert in the relevant field of the Challenged Patent at issue (as explained further in Section IX) and have been an expert in this field since before the Challenged Patent was filed with the United States Patent and Trademark Office ("USPTO"). I am familiar with how a person having ordinary skill in the art would have understood and used the terminology found in the '805 Patent at the time of its filing.

## III. TASK SUMMARY AND MATERIALS REVIEWED

16. I have been asked to review the Challenged Patent and its prosecution history, to provide an understanding of the technology relevant to the Challenged Patent, to review certain prior-art references, and to analyze whether those references disclose or teach limitations of claims from the Challenged Patent. The opinions stated in this declaration are from the perspective of a person of ordinary skill in the art (POSITA) at the time the Challenged Patent was filed.

## IV. LIST OF EXHIBITS

17. In forming my opinions, I have reviewed the Challenged Patent, its prosecution history and references cited by the Examiner, the materials cited in the List of Exhibits, and the materials cited throughout my declaration.

| Exhibit # | Description |
|---|---|
| EX1001 | U.S. Patent No. 9,586,805 to Shock ("the **'805 Patent**") |
| EX1002 | CV of Dr. Robert A Durham, PE, FIEEE |
| EX1003 | Expert Declaration of Dr. Robert A Durham, PE, FIEEE ("*Durham Decl.*") |
| EX1004 | U.S. Patent Pub. No. 2011/0197988 to Van Vliet et al. ("***Van Vliet***") |
| EX1005 | U.S. Patent No. 3,810,487 to Cable et al. ("***Cable***") |
| EX1006 | U.S. Patent Pub. No. 2018/0057348 to Lowrie ("***Lowrie***") |
| EX1007 | AFD Onsite Refueling, http://web.archive.org/web/20150922012312/https://www.afdpetroleum.com/fuel/onsite_refuelling (Sept. 22, 2015) ("***AFD***") |
| EX1008 | Coxreels 1125 Series Hand Crank and Motorized Hose Reels, https://web.archive.org/web/20140408035634/http://www.coxreels.com/products/hand-crank/1125-series (Apr. 08, 2014) ("*Coxreels*") |
| EX1009 | Federal Size Regulations for Commercial Motor Vehicles, https://web.archive.org/web/20110716103458/https://ops.fhwa.dot.gov/freight/publications/size_regs_final_rpt/size_regs_final_rpt.pdf (Jul. 16, 2011) |
| EX1010 | Claim Listing |
| EX1011 | File History of '805 Patent |
| EX1012 | Affidavit of Nathaniel E Frank-White (relating to *AFD*) |
| EX1014 | U.S. Patent Pub. No. 2007/0181212 to Joe Fell ("Fell") |
| EX1013 | U.S. Provisional Patent App. No. 62/378,394 to Lowrie (obtained from file history of *Lowrie* on USPTO's Patent Center) |

| | |
|---|---|
| EX1015 | U.S. Patent Pub. No. 2008/0223482 to Dagmar Hockner ("*Hockner*") |
| EX1016 | Michael Morton, "Unlocking the Earth: A Short History of Hydraulic Fracturing," GEO ExPro, Vol. 10, No. 6, December 2013 (https://geoexpro.com/unlocking-the-earth-a-short-history-of-hydraulic-fracturing/) (last accessed July 17, 2023) |
| EX1017 | Frac Shack "Technology" Page, archived on July 11, 2015 (https://web.archive.org/web/20150711214455/http:/www.fracshack.com/technology) ("Frack Shack I") (last accessed July 17, 2023) |
| EX1018 | Intentionally Omitted |
| EX1019 | B.A. Wells and K.L. Wells. "Shooters – A "Fracking" History." American Oil & Gas Historical Society, (https://aoghs.org/technology/hydraulic-fracturing) (last accessed July 17, 2023) |
| EX1020 | Intentionally Omitted |
| EX1021 | Intentionally Omitted |
| EX1022 | schematic, Vocabulary.com, https://www.vocabulary.com/dictionary/schematic (accessed June 29, 2023). |
| EX1023 | Bourgoyne, A. T., Jr., K. K. Millheim, M. E. Chenevert and F. S. Young, Jr. (1986). Applied Drilling Engineering, Society of Petroleum Engineers |
| EX1024 | Vassiliou, M. S. (2018), Historical dictionary of the petroleum industry, Rowman & Littlefield |
| EX1025 | U.S. Patent Application Publication No. 2013/0306322 to Sanborn *et al.* entitled "System and Process for Extracting Oil and Gas by Hydraulic Fracturing" ("*Sanborn*") |
| EX1026 | U.S. Patent Publication No. 2012/0255734 to Coli *et al.* entitled "Mobile, Modular, Electrically Powered System for Use in Fracturing Underground Formations" ("*Coli*") |
| EX1027 | U.S. Patent No. 4,187,962 to Henry *et al.* ("*Henry*") |
| EX1028 | Husky "Swivels" page, archived on March 28, 2016 (https://web.archive.org/web/20160328173930/http://www.husky.com/husky/swivels/conventional-fueling-swivels/) (last accessed Aug. 3, 2023) |
| EX1029 | Merriam-Webster Dictionary page with definition of "rack", https://www.merriam-webster.com/dictionary/rack#:~:text=rack%201%20of%209%20noun%20%281%29%20%CB%88rak%20Synonyms,grating%20on%20or%20in%20which%20articles%20are%20placed (last accessed |

| | |
|---|---|
| | Aug. 3, 2023) |
| EX1030 | Affidavit of Nathaniel E Frank-White (relating to *Coxreels*) |
| EX1031 | OSHA standard § 1910.36 from https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.36 (last accessed Aug. 1, 2023) |
| EX1032 | Alabama codes regarding trailer width limits |
| EX1033 | Arizona codes regarding trailer width limits |
| EX1034 | Michigan codes regarding trailer width limits |
| EX1035 | Missouri 2005 codes regarding trailer width limits |
| EX1036 | New York codes regarding trailer width limits |
| EX1037 | Kentucky codes regarding trailer width limits |
| EX1038 | Tennessee codes regarding trailer width limits |

18. All citations to exhibits reference original page numbers found in the underlying document, and all emphases are added unless otherwise noted.

## V. SUMMARY CONCLUSIONS AND GROUNDS FOR CHALLENGE

19. After reviewing the materials identified in the List of Exhibits, I have concluded that each of the claims of the '805 Patent would have been either anticipated by the prior art or obvious to a person of ordinary skill in the art, based on the following grounds:

| Ground | '805 Claims | Summary |
|---|---|---|
| 1 | 1-22 | Obvious over *Van Vliet* in view of *Cable* |
| 2 | 17 and 18 | Anticipated and/or rendered obvious by *Van Vliet* |
| 3 | 9 and 10 | Obvious over *Van Vliet* in view of *Cable*, further in view of *AFD* |
| 4 | 4, 11, 12, and 20 | Obvious over *Van Vliet* in view of *Cable*, further in view of *Coxreels* |
| 5 | 1, 7-10, 13-18, and 22 | Obvious over *Van Vliet* in view of *AFD* |
| 6 | 2-3, 6, and 19 | Obvious over *Van Vliet* in view of *AFD*, further in view of *Lowrie* |
| 7 | 4, 5, 20, and 21 | Obvious over *Van Vliet* in view of *AFD*, further in view of *Lowrie*, further in view of *Coxreels* |
| 8 | 11 and 12 | Obvious over *Van Vliet* in view of *AFD*, further in view of *Coxreels* |

## VI. LEGAL STANDARDS

### A. Level of Ordinary Skill in the Art

20. When interpreting a patent, I understand that it is important to identify the relevant art pertaining to the patent-in-suit as well as the level of ordinary skill

in that art at the time of the claimed invention. The "art" is the field of technology to which the patent is related.

21. I have been instructed by counsel that the person of ordinary skill in the art is a hypothetical person who is presumed to know the relevant prior art. I understand that the actual inventor's skill is not determinative of the level of ordinary skill. I further understand that the factors that may be considered in determining the level of skill include: the types of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field. I understand that not all such factors may be present in every case, and one or more of them may predominate.

### B. Legal Standard for Claim Construction

22. I understand that the first step in determining whether a patent claim would have been anticipated or obvious is to ascertain how a POSITA would have understood the claim terms.

23. I have been instructed by counsel on the law regarding claim construction and patent claims, and I understand that a patent may include two types of claims: independent claims and dependent claims. An independent claim stands alone and includes only the limitations it recites. A dependent claim can depend from an independent claim, or it can further depend from another dependent claim. I

understand that a dependent claim includes all the limitations that it recites, in addition to all the limitations recited in the claim(s) from which it depends.

24. It is my understanding that in proceedings before the USPTO, the claims of a patent are to be construed under what is referred to as the "Phillips standard." I understand that this means that claim terms of a patent are given the meaning the terms would have to a POSITA, in view of the description provided in the patent itself and the patent's file history.

25. I understand that to determine how a person of ordinary skill would have understood a claim term, one should look to those sources available that show what a person of skill in the art would have understood the disputed claim language to mean. I understand that, in construing a claim term, one looks primarily to the intrinsic patent evidence, including the words of the claims themselves, the remainder of the patent, and the patent's prosecution history. I understand that extrinsic evidence, which is evidence external to the patent and the prosecution history, may also be useful in interpreting patent claims when the intrinsic evidence itself is insufficient.

26. I understand that words or terms should be given their ordinary and accepted meaning unless it appears that the inventors were using them to mean something else. In making this determination, the claims, the remainder of the patent, and the prosecution history are of paramount importance. Additionally, the patent

and its prosecution history must be consulted to confirm whether the patentee has acted as its own lexicographer (*i.e.*, provided its own special meaning to any disputed terms), or intentionally disclaimed, disavowed, or surrendered any claim scope.

27. In comparing the claims of the Challenged Patent to the prior art, I have considered the Challenged Patent and its file history considering the understanding of a person of skill at the time of the alleged invention.

### C. Anticipation

28. It is my understanding that the claims of a patent are anticipated by a prior art reference if each and every element of the claim is found either explicitly or inherently in a single prior art reference or system. I understand that inherency requires a showing that the missing descriptive matter in the claim is necessarily or implicitly present in the allegedly anticipating reference, and that it would have been so recognized by a POSITA. In addition, I understand that an enabling disclosure is a disclosure that allows a POSITA to make the invention without undue experimentation. Although anticipation typically involves the analysis of a single prior art reference, I understand that additional references may be used to show that the primary reference has enabling disclosure, to explain the meaning of a term used in the primary reference, and/or to show that a characteristic is inherent in the primary reference.

### D. Obviousness

29. I understand that the prior art may render a patent claim "obvious." I understand that two or more prior art references (*e.g.*, prior art articles, patents, or publications) that each disclose fewer than all elements of a patent claim may nevertheless be combined to render a patent claim obvious if the combination of the prior art collectively discloses all elements of the claim and one of ordinary skill in the art at the time would have been motivated or had sufficient rationale to combine the prior art in such a way. I understand that this rationale or motivation to combine need not be explicit in any of the prior art but may be inferred from the knowledge of one of ordinary skill in the art at the time the patent was filed. I also understand that one of ordinary skill in the art is not an automaton but is a person having ordinary creativity. I further understand that one or more prior art references, articles, patents, or publications that disclose fewer than all the elements of a patent claim may render a patent claim obvious if including the missing element would have been obvious to one of skill in the art (*e.g.*, the missing element represents only an insubstantial difference over the prior art or a reconfiguration of a known system).

30. I understand that under the doctrine of obviousness, a claim may be invalid if the differences between the invention and the prior art are such that the subject matter would have been obvious at the time the invention was made to a POSITA to which the subject matter pertains.

31. To assess obviousness, I understand that I am to consider the scope and content of the prior art, the differences between the prior art and the claim, the level of ordinary skill in the art, and any secondary considerations to the extent they exist.

32. I understand that any evidence of secondary indicia of non-obviousness should be considered when evaluating whether a claimed invention would have been obvious to one of ordinary skill at the time of invention. These secondary indicia of non-obviousness may include, for example:

- a long felt but unmet need in the prior art that was satisfied by the claimed invention;
- commercial success of processes claimed by the patent;
- unexpected results achieved by the invention;
- praise of the invention by others skilled in the art;
- the taking of licenses under the patent by others; and
- deliberate copying of the invention.

33. I understand that there must be a nexus between any such secondary indicia and the claimed invention.

34. It is also my understanding that there are additional considerations that may be used as further guidance as to when the above factors will result in a finding that a claim is obvious, including the following:

- the claimed subject matter is simply a combination of prior art elements according to known methods to yield predictable results;

- the claimed subject matter is a simple substitution of one known element for another to obtain predictable results;

- the claimed subject matter uses known techniques to improve similar devices or methods in the same way;

- the claimed subject matter applies a known technique to a known device or method that is ready for improvement to yield predictable results;

- the claimed subject matter would have been "obvious to try" choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

- there is known work in one field of endeavor that may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to a POSITA;

- there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims; and

- there is some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed subject matter.

35. Finally, I understand that a claim may be deemed invalid for obviousness in light of a single prior art reference, without the need to combine references, if the elements of the claim that are not found in the reference can be supplied by the knowledge or common sense of one of ordinary skill in the relevant art.

### E. Priority Date

36. I understand that, subject to the next paragraph, the asserted "priority date" of a patent is the earlier of: (a) the date on which a patent application is filed;

or (b) the date on which an earlier-filed patent application is filed if the patentee claims the benefit of priority to that earlier-filed patent application.

37. I understand that it is not enough for a patent to merely claim the benefit of an earlier-filed application, but that additional criteria must be met. In particular, the prior application itself must describe the claimed invention, and must do so in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought. First, I understand that a priority-date analysis is on a claim-by-claim basis. Second, I understand that, for a patent claim to be entitled to the filing date of an earlier patent application, a "Section 112 analysis" must be conducted. I am informed that a "Section 112" analysis encompasses looking to the earlier patent application and ascertaining whether that earlier patent application meets both the written-description and enablement requirements as of the filing date of the earlier application. I understand that it is not enough that the claim would have been obvious from the earlier application, but that application itself must describe the claimed invention.

38. I understand that to satisfy the written description requirement the earlier application must reasonably convey to those skilled in the art that the inventors had possession of the subject matter of the patent as of the filing date of the earlier application. I have been informed that it is the disclosures of the earlier patent application that count, and that while the meaning of terms, phrases, or

diagrams in the earlier patent application must be interpreted from the vantage point of one skilled in the art, all the claimed limitations must appear in the specification. Further, I understand that this analysis is not a question of whether one skilled in the art might be able to construct the claimed invention from the teachings of the disclosure. The question is not whether a claimed invention is an obvious variant of that which is disclosed in the specification; rather, I understand that an earlier application must itself describe each of the claim limitations.

39. I also understand that to satisfy the enablement requirement, the earlier application must enable a person of ordinary skill in the art to practice the claimed invention without undue experimentation.

### F. Burden of Proof

40. I understand that a party alleging a patent claim is invalid (including by obviousness) bears the burden of proof by "clear and convincing evidence." I have been informed that clear and convincing evidence means evidence that produces a firm belief or conviction as to truth of the matter sought to be established. I have further been informed that the parties submitted that clear and convincing evidence is evidence that is so clear, direct, weighty, and convincing as to enable one to come to a clear conviction without hesitancy.

## VII. OVERVIEW OF THE CHALLENGED PATENT

41. I have reviewed U.S. Patent No. 9,586,805 ("the '805 Patent"), which is entitled "Mobile Distribution Station with Aisle Walkway."[1] I understand that the '805 patent was filed on October 11, 2016, and that it was issued on March 7, 2017.[2] I understand that the '805 Patent does not claim priority to an earlier filing date. Accordingly, the effective filing date of the '805 Patent is October 11, 2016.[3]

### A. Summary of Subject Matter

42. The '805 Patent relates to a distribution station for distributing fuel or other fluids, for example to equipment at a hydraulic fracturing site.[4] The '805 Patent includes a section entitled "Background."[5] The "Background" section discusses several known aspects of hydraulic fracturing, including the process of "hot-refueling" during fracturing operations:[6]

> Hydraulic fracturing (also known as fracking) is a well stimulation process that utilizes pressurized liquids to fracture rock formations. Pumps and other equipment used for hydraulic fracturing typically operate at the Surface of

[1] EX1001, Title.

[2] EX1001, Cover.

[3] EX1001, Cover.

[4] *See* EX1001, 1:21-27, 3:25-35.

[5] EX1001.

[6] EX1001, 1:6-18.

> the well site. The equipment may operate semi-continuously, until refueling is needed, at which time the equipment may be shut-down for refueling. Shut-downs are costly and reduce efficiency. More preferably, to avoid shut-downs fuel is replenished in a hot-refueling operation while the equipment continues to run. This permits fracking operations to proceed fully continuously; however, hot-refueling can be difficult to reliably sustain for the duration of the fracking operation.

43. The ’805 Patent discusses that it was known that hydraulic fracturing equipment operates semi-continuously and that, in order to reduce unwanted shutdowns, it was known to “hot-refuel” the equipment, or to re-fuel the equipment while it was still running.[7] A known problem of hot-refueling, according to the ’805 Patent, was that “hot-refueling can be difficult to reliably sustain for the duration of the fracking operation.”[8] The ’805 patent purports to solve this problem by combining known components, such as a mobile trailer, a pump, manifolds, a plurality of reels, a plurality of hoses, a plurality of valves, a plurality of fluid level sensors, and an aisle walkway, among others according to their known functions.[9]

[7] EX1001, 1:10-15.

[8] EX1001, 1:16-18.

[9] EX1001, 1:21-27; *see also id.*, Claims 1-22.

### B. The Challenged Claims of the ’805 Patent

44. The challenged claims of the ’805 Patent, which are Claims 1-22, are set forth below.[10] Some of the claim elements have been further sub-divided for ease of reference.

| Claim Element | Claim Language from ’805 Patent |
|---|---|
| 1(pre) | A distribution station comprising: |
| 1(a) | a mobile trailer; |
| 1(b) | a pump on the mobile trailer; |
| 1(c) | first and second manifolds on the mobile trailer and fluidly connected with the pump; |
| 1(d) | a plurality of reels on the mobile trailer; |
| 1(e) | a plurality of hoses connected, respectively, with the reels; |
| 1(f) | a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses; |
| 1(g) | a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses; |
| 1(h) | wherein the reels are arranged on first and second opposed sides in the mobile trailer, with an aisle walkway down the middle of the mobile trailer. |

[10] A separate Claim Listing is included as EX1010 for use as reference with the Petition.

| Claim Element | Claim Language from '805 Patent |
|---|---|
| 2 | The distribution station as recited in claim 1, wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels. |
| 3 | The distribution station as recited in claim 2, further comprising first and second support racks on which the reels are supported, the first support rack arranged on the first side and the second support rack arranged on the second side. |
| 4 | The distribution station as recited in claim 3, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3. |
| 5 | The distribution station as recited in claim 4, wherein the trailer has a trailer width of no greater than about 96 inches. |
| 6 | The distribution station as recited in claim 2, wherein a ratio of a number of reels in the upper row to a number of reels in the lower row is 1:1. |
| 7 | The distribution station as recited in claim 1, wherein the mobile trailer includes trailer end wall that has an outside door, an inside wall that defines first and second compartments in the mobile trailer, the outside door opening into the first compartment, and at least the manifolds and the reels are in the first compartment. |
| 8 | The distribution station as recited in claim 7, wherein the inside wall includes an inside door providing access between the first compartment and the second compartment, the aisle walkway extending from the outside door to the inside door. |
| 9 | The distributions station as recited in claim 7, further comprising a controller in the second compartment, the controller configured to operate the valves. |

| Claim Element | Claim Language from '805 Patent |
|---|---|
| 10 | The distribution station as recited in claim 9, wherein the second compartment is insulated with a fire resistant or retardant material. |
| 11 | The distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3. |
| 12 | The distribution station as recited in claim 11, wherein the aisle width is greater than the reel diameter by a factor of at least 1.5. |
| 13 | The distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the mobile trailer has a trailer width, and a ratio of the trailer width to the aisle width is no greater than 5. |
| 14 | The distribution station as recited in claim 13, wherein the ratio of the trailer width to the aisle width is greater than 2. |
| 15 | The distribution station as recited in claim 1, wherein the ratio of the trailer width to the aisle width is equal to or less than 4. |
| 16 | The distribution station as recited in claim 1, further comprising a floor pan in the mobile trailer. |
| 17(pre) | A distribution station comprising: |
| 17(a) | a mobile trailer, |
| 17(b) | a pump on the mobile trailer, |
| 17(c) | first and second manifolds on the mobile trailer and fluidly connected with the pump, |
| 17(d) | a plurality of reels on the mobile trailer, |

| Claim Element | Claim Language from '805 Patent |
|---|---|
| 17(e) | a plurality of hoses connected, respectively, with the reels, wherein a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold; |
| 17(f) | a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses; |
| 17(g) | a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses; |
| 17(h) | wherein the mobile trailer includes first and second opposed trailer side walls, and a first group of the hoses are deployable from the first trailer side wall and a second group of the hoses are deployable from the second trailer side wall. |
| 18 | The distribution station as recited in claim 17, wherein the reels are arranged on first and second opposed sides in the mobile trailer such that there is an aisle walkway down the middle of the trailer. |
| 19 | The distribution station as recited in claim 18, wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels. |
| 20 | The distribution station as recited in claim 19, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3. |
| 21 | The distribution station as recited in claim 20, wherein the mobile trailer has a trailer width of no greater than about 96 inches. |
| 22 | The distribution station as recited in claim 17, further comprising a floor pan in the mobile trailer. |

### C. Relevant Prosecution History of the ’805 Patent

45. I have reviewed the prosecution history of the ’805 Patent. Application serial no. 15/290,371 (the “’371 Application”) was filed on October 11, 2016 with 22 claims (Claim 1 – Claim 22).[11] No office actions were issued.[12] On December 29, 2016 the examiner issued a Notice of Allowance (NOA), allowing all the filed claims.[13] The examiner noted that “the prior art of record does not teach ‘wherein the reels are arranged on first and second opposed sides of the mobile trailer’” and that “the prior art of record does not teach ‘and a first group of the hoses are deployable from the first trailer side wall and a second group of the hoses are deployable from the second trailer sidewall.’”[14]

46. Further, the NOA state that US Patent Publication 2011/0197988 (*Van Vliet*) teaches “a mobile fuel delivering system having a plurality of hoses connected to a plurality of manifolds, but doesn’t disclose reels arranged on opposed sides of the trailer or hoses deployable from the first and second sides of the trailer.”[15] However, these limitations relied on by the examiner in allowing the claims were

[11] EX1011, 1.

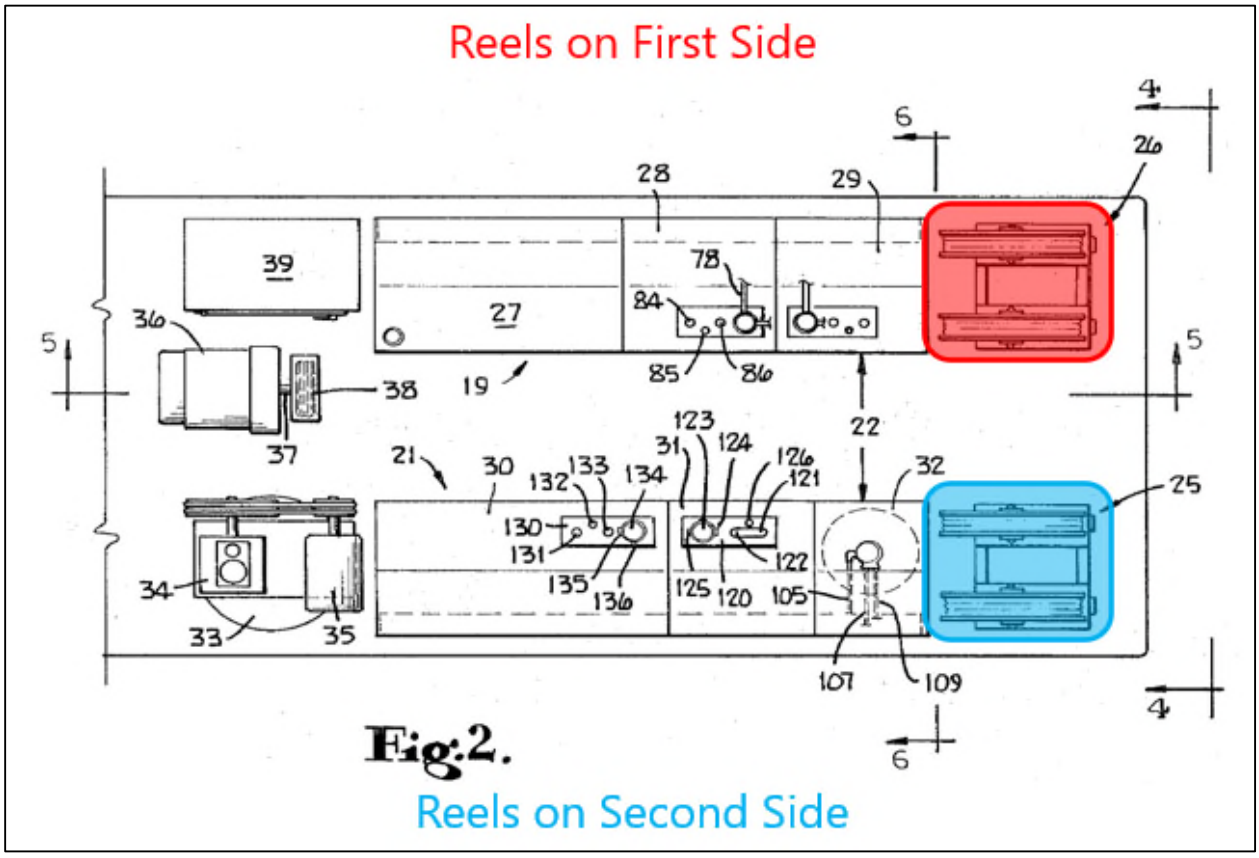
[12] *See* EX1011 *generally*.

[13] EX1011, 10-14.

[14] EX1011, 15-16.

[15] EX1011, 15-16.

known in the art as I describe in Section XI below.[16] As an example, *Cable* discloses reels with hoses arranged on opposite side walls of the trailer, as shown in *Cable*'s FIG. 2.[17]




[16] *See infra*. Section XI.

[17] EX1005, FIG. 2 (below) (annotated to show reels on first and second sides) *see also id.*, 2:67-3:5 ("Each of the hose assemblies has ***a pair of upper reels and a pair of lower reels*** rotatably mounted to the frame of a wheel assembly.").

47. As another example, the "AFD Onsite Refuelling System" was advertised publicly at least as early as September 22, 2015.[18] [19] An archived version of the AFD Website, accessed through the Internet Archive's Wayback Machine shows the limitations relied on by the examiner in the NOA. For example, the images on the website show hoses deployed from both sides of the AFD refueling trailer.[20]


[18] *See* EX1012; *see also* EX1007.

[19] EX1012 includes a copy of EX1007 as Exhibit A. Where, I cite to EX1007, I incorporate by reference the corresponding disclosure of EX1012, Exhibit A and *vice versa*.

[20] EX1007 (below) (excerpted, duplicated, and annotated to show hoses deployed from both sides).


48. The webpage further explains that the hoses are stored on reels: "[t]he main body of the trailer contains 24 fuel reels, each with 300-450' of 1" hose allowing for greater flexibility in tight locations."[21]

49. Further, although the examiner did not appreciate it, *Van Vliet* teaches, or at least suggests, the exact arrangement, orientation and deployment of hoses, reels and sidewalls relied on by the examiner in allowing the claims. A further explanation of my analysis concerning *Van Vliet* with respect to these claim limitations is contained in Section XI.B.[22]

### D. Claim Construction

50. In my opinion, all the claim terms in the '805 Patent should be given their plain and ordinary meaning, as a POSITA would have understood them in light of the specification and file history of the '805 Patent. Except as otherwise noted, I

[21] EX1007.

[22] *See infra.* Section XI.B.

have applied such a plain and ordinary meaning in my analysis of the claims. I reserve the right to offer additional opinions on claim construction in response to arguments that may be made by Patent Owner.

## VIII. TECHNOLOGY BACKGROUND

51. In the subsections below, I describe some of the basic aspects of the technology field of the alleged invention of the Challenged Patent that were well-known as of filing.

### A. History of Hydraulic Fracturing

52. Fracturing the hydrocarbon bearing formations is a technique that has been used to increase or speed up oil and gas production for nearly as long as oil and gas production has existed. Fracturing methods as early as the 1850's used explosives such as gunpowder ignited by red-hot iron or nitroglycerin "torpedoes."[23] Hydraulic fracturing, in its modern form of pumping liquids and proppants (sand) into the formation, began in the 1940s using a process developed by Stanolind Oil and used by Halliburton in the mid-continent region.[24]

[23] EX1016.

[24] EX1016.

53. On March 17, 1949, Stanolind and Haliburton performed the first commercial application of hydraulic fracturing at a location about 12 miles east of Duncan, Oklahoma.[25]

54. The expansion of directional and horizontal drilling extended the use of hydraulic fracturing into previously underdeveloped "tight" formations, including shale.[26] In oil and gas exploration, directional drilling is a technique for accessing hydrocarbon bearing formations (oil and gas formations) that are not located immediately beneath the surface location, or to increase the amount of formation exposed to the wellbore. Some tool or process is used to cause the well bore to deviate from the vertical to reach previously inaccessible formation locations, to expose more of the hydrocarbon bearing formation to the well bore, or to drill several

[25] EX1019.

[26] EX1016.

wells from a single surface location, such as an offshore platform or a land-based drilling pad. Like most developments in the oil and gas industry "the early drilling of directional wells was clearly motivated by economics."[27] It was the offshore fields of California that spawned the technology which led to modern directional and horizontal drilling. In the 1930s, directional drilling was being used in the Huntington Beach, California field to reach an offshore oil-bearing formation from a well initiated on an onshore pad.

55. Throughout the 1980s, directional drilling increased, in particular on offshore pads and in the Austin Chalk trend of central Texas. The Austin Chalk is a soft, loosely cemented, easily pulverized limestone characterized by natural fractures oriented primarily vertically. Horizontally deviated wells were drilled into the chalk to intersect several of the natural fractures, allowing for transport of the hydrocarbons into the wellbore. This was combined with artificial fracturing to increase the flowrate of hydrocarbons. By at least 1986, the techniques of horizontal drilling were well known and heavily developed. In 1986, the "first successful multifracture horizontal well is drilled in Wayne County, West Virginia."[28] This well used directional drilling to cause the wellbore to enter a more or less horizontal

[27] EX1023, 351.

[28] EX1024, xliii.

orientation (parallel to the surface of the earth) and combined it with advanced hydraulic fracturing techniques (originally developed in the 1940s) to not only expose large lengths of the hydrocarbon formation to the wellbore, but also to create artificial cracks or "fractures" in the formation from multiple location in order to allow the hydrocarbons to "leak" out of the formation into the wellbore.

56. The use of horizontal drilling and fracturing systems in shale formations led to the U.S. vastly increasing its oil and especially natural gas production—starting in the 1980s and continuing to present day.[29]


[29] EX1019 (2011 map from the Energy Information Administration showing shale plays where hydraulic fracturing is common).

57. As more formation is exposed to be fractured, horizontal wells use much higher volumes of fracturing fluid and proppant than do vertical wells. This requires the use of more and bigger blending and pumping systems. As discussed by *Sanborn*, pumping systems of 32,000 hp were typically used as early as 2012.[30] Other references, such as *Coli*, suggest systems of pumps as large as 2,500 hp each, with total system power as high as 40,000 hp were used in the same time period (four trailers, each with four 2500 hp pumps operating in parallel).[31] These pumps are typically triplex or quintuplex positive displacement (plunger) type pumps.[32] Although some fracturing systems have been converted to electric driven pump motors, the large majority of hydraulic pumping systems "are typically mobilized on skids or tractor-trailers and powered using diesel motors."[33] These diesel engines require large amounts of diesel fuel, along with the requisite extra safeguards to address potential safety concerns.[34]

58. Fracturing is often conducted in remote locations and is typically powered using fuel brought to the frac site. The amount of fuel necessary to be

[30] EX1025, [0005].

[31] EX1026, [0049], FIG. 2.

[32] EX1025, [0005]; EX1026, [0011].

[33] EX1026, [0005]; *see also id.*, [0007] ("standard fluid pumps require large volumes of diesel fuel and extensive equipment maintenance programs").

[34] EX1025, [0007].

delivered to the fracturing site, and the diesel-powered fracturing pumps, presented known logistical challenges such as site congestion, orientation and arrangement of fracturing equipment, and safety concerns for personnel in the "red zone."[35]

### B. Mobile Fuel Delivery

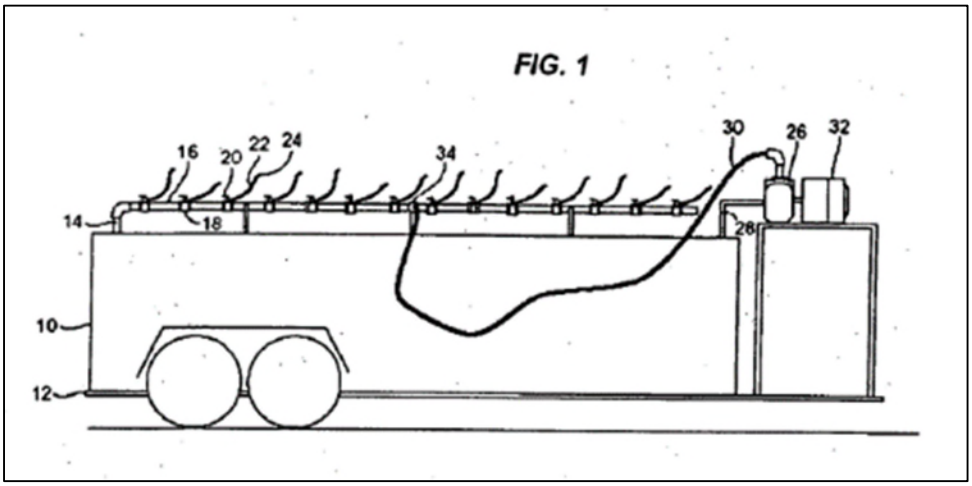
59. Although the volumes of fuel used in fracturing sites continued to increase, mobile fuel delivery was well-known in the prior art for many years before the '805 Patent was filed. For example, as a licensed pilot I am familiar with "fuel trucks" that deliver aviation fuel to aircraft which are parked on the ramp. These fuel trucks carry and deliver fuels, such as Aviation Gasoline (AvGas) or Jet Fuel (Jet A) to aircraft without the necessity of moving the aircraft. As the fuel trucks are generally smaller and more maneuverable than the aircraft, this practice increases not only convenience but safety when refueling aircraft. As an example, US Patent 4,187,962 ("*Henry*") describes a mobile liquid-dispensing apparatus usable for refueling airplanes and the like. *Henry*'s apparatus includes "a reel-mounted, extensible and retractable, fluid delivery conduit connected to an adjacent liquid supply."[36] *Henry* also discloses that such a practice is not limited to aircraft but is

[35] The "red zone" at a fracturing site is an area surrounding the fracturing pumps and the wellheads where personnel would be exposed to high pressure piping, risk of fire and high noise. As such, it is a dangerous environment and common practice is to keep personnel out of the red zone whenever practical.

[36] EX1027, Abstract.

applicable to "airplanes or other equipment which cannot conveniently be brought to a central fuel depot."[37]

60. This practice was not limited to refueling equipment one at a time. As another example of mobile fueling, U.S. Patent Pub. No. 2007/0181212 ("*Fell*") (published on August 9, 2007) discloses a portable refueling dock for simultaneously refueling multiple pieces of equipment.[38] *Fell* describes fueling in the context of "a construction site, [where] large vehicles that are used in moving and hauling dirt and debris need to be refueled."[39] As illustrated in FIG. 1 (below), *Fell* discloses that its portable refueling dock has a fuel tank 10 supported by a wheeled base 12, such as a trailer.[40]



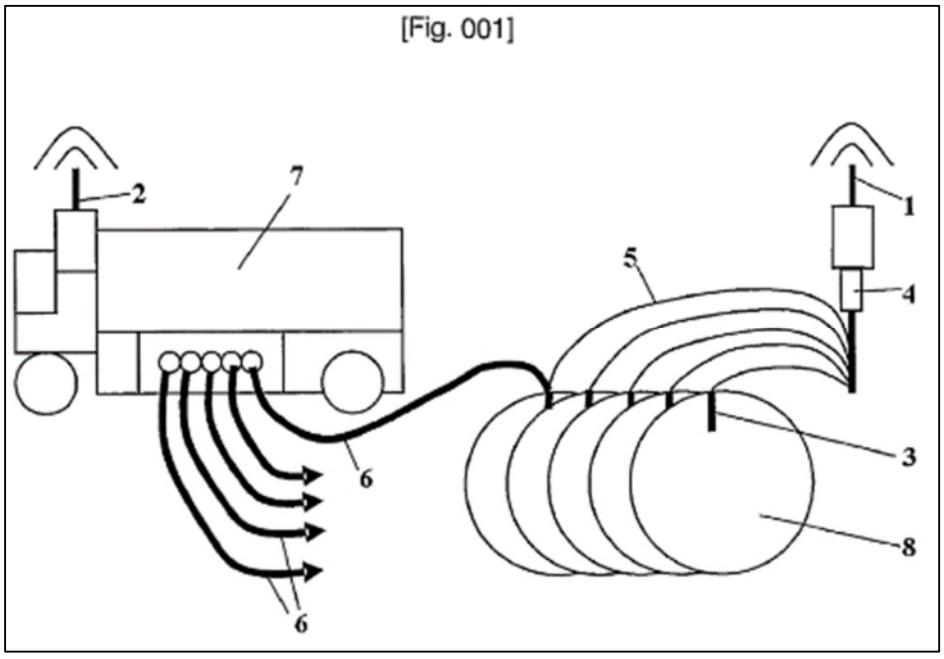

[37] EX1027, 1:9-11.

[38] EX1014, Abstract, [0003]-[0004], [0007].

[39] EX1014, [0003].

[40] EX1014, [0005], [0014]-[0015] FIG. 2.

61. As another example, U.S. Patent Pub. No. 2008/0223482 ("*Hockner*") (published September 18, 2008) discloses a tank truck for fuel delivery.[41] ("During filling of the tanks 3 [sic; 8], hoses **6** are extended from the tank truck **7** to the tanks 8 and connected thereto."). *Hockner* describes mobile fuel delivery in the context of "filling of tanks at filling stations."[42] As illustrated in FIG. 1 (below), *Hockner* discloses a tank truck **7** with a fuel tank. A plurality of hoses **6** connect to the tank truck, where the fuel flow in each hose is controlled by a respective valve **10**. Hoses 6 extend from the valves to simultaneously deliver fuel to a plurality of fuel tanks **8**.[43]




[41] *See* EX1015, [0016].

[42] EX1015, [0004].

[43] EX1015, FIG. 1, 2:54-3:10.

62. As yet another example, Frac Shack advertised on its website's "Technology" page at least as early as July 11, 2015, a "modular" "fuel delivery system."[44] *Frack Shack* describes mobile fuel delivery in the context of fracking operations.[45] The archived video embedded on that page shows the product being stored and moved on mobile trailers:[46]


[44] EX1017 ("*Frac Shack*").

[45] *See* EX1017.

[46] https://web.archive.org/web/20160301185135/https://www.youtube.com/watch?v=O_RKs5cZxHY(around timestamps 00:12 & 00:31).


63. U.S. Patent Pub. No. 2011/0197988 to Van Vliet et al. ("*Van Vliet*"), U.S. Patent Pub. No. 2018/0057348 to Lowrie ("*Lowrie*"), and AFD Onsite Refueling (http://web.archive.org/web/20150922012312/https:/www.afdpetroleum.com/fuel/onsite_refuelling) ("*AFD*")[47] provide still further examples of mobile fuel delivery and are discussed further in Section XI.[48]

### C. Trailer Size Requirements

64. As of the time of the filing of the '805 patent there were a patchwork of standards and regulations relating to the design of vehicle-mounted systems, such as the ones on trailers. Prior to 1956, there were no national standards or regulations

[47] I note that *AFD* appears to be associated with a service offered by AFD Petroleum Ltd. (*see* copyright mark at the bottom of EX1007) and *Lowrie* appears to be an application assigned to AFD Petroleum Ltd. (*see* EX1006, Cover).

[48] *See infra.* Section X.

governing the size, particularly the width, of trailers which travelled the US Highway system (National Network (NN) of highways). In 1956, the Federal-Aid Highway act of 1956 provided that a maximum vehicle width of 96 inches be allowed on the Interstate highway system. This was expanded to a maximum width of 102 inches in 1982 with passage of the Surface Transportation Assistance Act (STAA). Further, the 102-inch requirement was expanded to include the NN of highways. These provisions, however, *only* cover the US highway system, and do not automatically extend to state highways or other roadways.

65. As an example, in 2018, Alabama had a maximum width of 96 inches for roads with a lane width of less than 12 feet, which would include state and county maintained roads commonly used to access fracturing sites.[49] Similarly, Arizona's state statute requires that, except for exceptions identified in the statute, "the total outside width of a vehicle or the load on the vehicle shall not exceed eight feet."[50] As other examples, Michigan, Missouri, New York, Kentucky, and Tennessee have similar requirements where the maximum width for a vehicle on the state roads is

[49] EX1032, AL Code § 32-9-20 (2018).

[50] EX1033, AR Code § 28-1093 (2005).

96," with exceptions for roads on the NN highway system, Interstate Highway System or roads of similar construction.[51]

66. A POSITA would have recognized that oil and gas exploration and production facilities, where equipment such as fracturing pumps are being used, are not located on the Interstate highway system, are rarely located adjacent to a NN highway, and are frequently in remote, rural areas, often accessed from county roads or the like. Accordingly, a POSITA would recognize that, for a particular vehicle, trailer, or load to operate safely and universally throughout the country, a base maximum width of 96 inches would be required on trucks, trailers and loads.

### D. Hoses and Reels

67. As seen above, regarding Mobile Fuel Delivery, the use of hoses and reels for fuel delivery was well-known in the art. For example, *Fell* discloses that "hoses 22 can be unspooled from hose reels that can be used to store the hoses" and the hoses reels may be mounted on the base of a portable refueling dock.[52] As another example, *Hockner* describes that "[d]uring filling of the tanks 3 [sic; 8], hoses 6 are extended from the tank truck 7 to the tanks 8 and connected thereto."[53] Further,

[51]EX1034, MI Code §256.17 (2018); EX1035, MO Code §304.170 (2005); EX1036, NY Code §Title 3, Article 10, §385 (2018); EX1037, KY Code § 189.221 (2009); EX1038, TN Code §55-7-202 (2021).

[52] EX1014, [0022].

[53] EX1015, [0016].

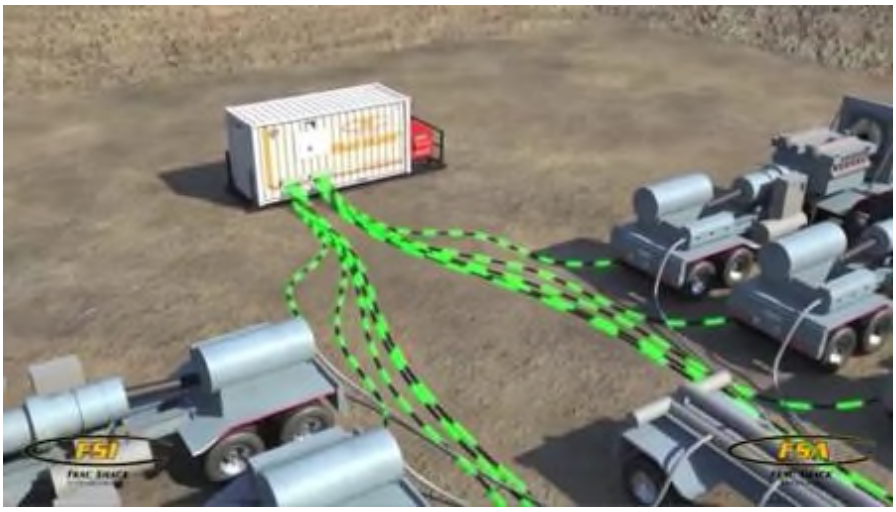
*Henry* describes "a reel-mounted, extensible and retractable, fluid delivery conduit connected to an adjacent liquid supply" for use in delivering fuel to "aircraft or other equipment which cannot conveniently be brought to a central fuel depot."[54]As yet another example, Frac Shack's advertisement for its fuel delivery system on its website's "Technology" page shows hoses arranged on reels:[55]

The embedded video on that webpage shows fuel being distributed using the hoses:[56]

[54] EX1027, 1:9-11.

[55] EX1017 (excerpted).

[56] https://web.archive.org/web/20160301185135/https://www.youtube.com/watch?v=O_RKs5cZxHY(around timestamp 00:43).



68. Further, the use of reels to support hoses, including reels that are part of the "flow path" of the fluids being transferred were well known. For example, one type of commercially available hose reel system was provided by Coxreels. Coxreels was a known supplier of hose reels, as supported by the Coxreels website from April 8, 2014 describing the Coxreels 1125 Series hand crank and motorized hose reels.[57]

[57] EX1008.

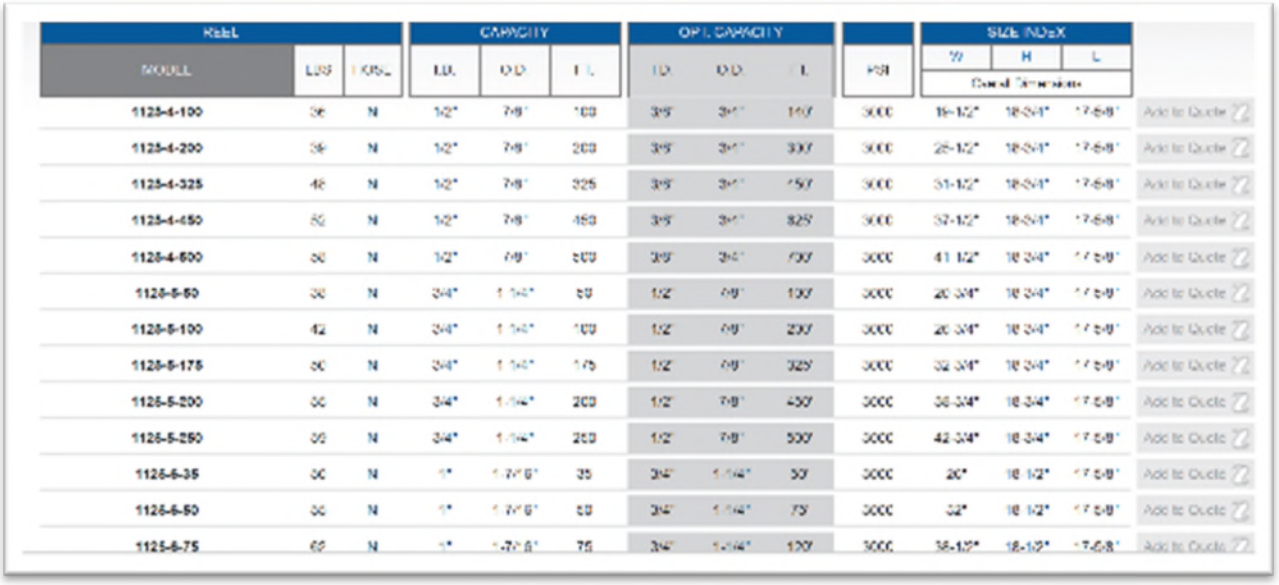

69. Coxreels 1125 Series Hand Crank and Motorized Hose Reels ("*Coxreels*") was made available online at least as early as April 8, 2014, as explained in the affidavit of the Internet Archive representative.[58] The public accessibility of *Coxreels* is established by the Internet Archive, Wayback Machine, which preserved *Coxreels* on April 8, 2014.[59]

70. The Coxreels' 1125 reels come in various heights and widths; the length/diameter of each reel is 17 and 5/8 inches. A portion of the table from

[58] *See* EX1030.

[59] *See* EX1030.

*Coxreels* showing an example of the sizes of reels available at the time of *Coxreels* is duplicated below.[60]



| Reel | | | Capacity | | | Opt. Capacity | | | | Size Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Lbs | Osc. | I.D. | O.D. | L | I.D. | O.D. | L | PSI | W | H | L | |
| | | | | | | | | | | Overall Dimensions | | | |
| 1125-4-100 | 36 | N | 1/2" | 7/8" | 100 | 3/5" | 3/4" | 100' | 3000 | 16-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-4-200 | 36 | N | 1/2" | 7/8" | 200 | 3/5" | 3/4" | 300' | 3000 | 25-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-4-325 | 48 | N | 1/2" | 7/8" | 325 | 3/5" | 3/4" | 450' | 3000 | 31-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-4-450 | 60 | N | 1/2" | 7/8" | 450 | 3/5" | 3/4" | 625' | 3000 | 37-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-4-600 | 66 | N | 1/2" | 7/8" | 600 | 3/5" | 3/4" | 700' | 3000 | 41 1/2" | 18 3/4" | 17 5/8" | Add to Quote |
| 1125-5-50 | 36 | N | 3/4" | 1 1/4" | 50 | 1/2 | 7/8" | 100' | 3000 | 20 3/4" | 18 3/4" | 17 5/8" | Add to Quote |
| 1125-5-100 | 42 | N | 3/4" | 1 1/4" | 100 | 1/2 | 7/8" | 200' | 3000 | 26 3/4" | 18 3/4" | 17 5/8" | Add to Quote |
| 1125-5-175 | 60 | N | 3/4" | 1 1/4" | 175 | 1/2 | 7/8" | 325' | 3000 | 32 3/4" | 18 3/4" | 17 5/8" | Add to Quote |
| 1125-5-200 | 66 | N | 3/4" | 1 1/4" | 200 | 1/2 | 7/8" | 450' | 3000 | 38 3/4" | 18 3/4" | 17 5/8" | Add to Quote |
| 1125-5-250 | 66 | N | 3/4" | 1 1/4" | 250 | 1/2 | 7/8" | 500' | 3000 | 42 3/4" | 18 3/4" | 17 5/8" | Add to Quote |
| 1125-6-35 | 66 | N | 1" | 1 7/8" | 35 | 3/4" | 1 1/4" | 50' | 3000 | 20" | 18 1/2" | 17 5/8" | Add to Quote |
| 1125-6-50 | 66 | N | 1" | 1 7/8" | 50 | 3/4" | 1 1/4" | 75' | 3000 | 22" | 18 1/2" | 17 5/8" | Add to Quote |
| 1125-6-75 | 66 | N | 1" | 1 7/8" | 75 | 3/4" | 1 1/4" | 100' | 3000 | 26 1/2" | 18 1/2" | 17 5/8" | Add to Quote |

71. I am familiar with products such as those described in *Coxreels* for use as in various applications, including refueling. As an example, I have used fixed diesel fuel stations that had similar reels for the storage of fueling hoses to fuel company and personal vehicles being used in the oil field. Further, as a licensed pilot, I am familiar with the use of reels, such as those used in *Coxreels* on mobile fueling trucks used to fuel aircraft. The use of such reels, for example for fuel distribution, was well known to me, and would have been well known to a POSITA, at the time of the '805 Patent.

[60] EX1008.

72. The Coxreels website describes an "[e]xternal fluid path with machined from solid brass 90° full-flow NPT swivel inlet":[61]

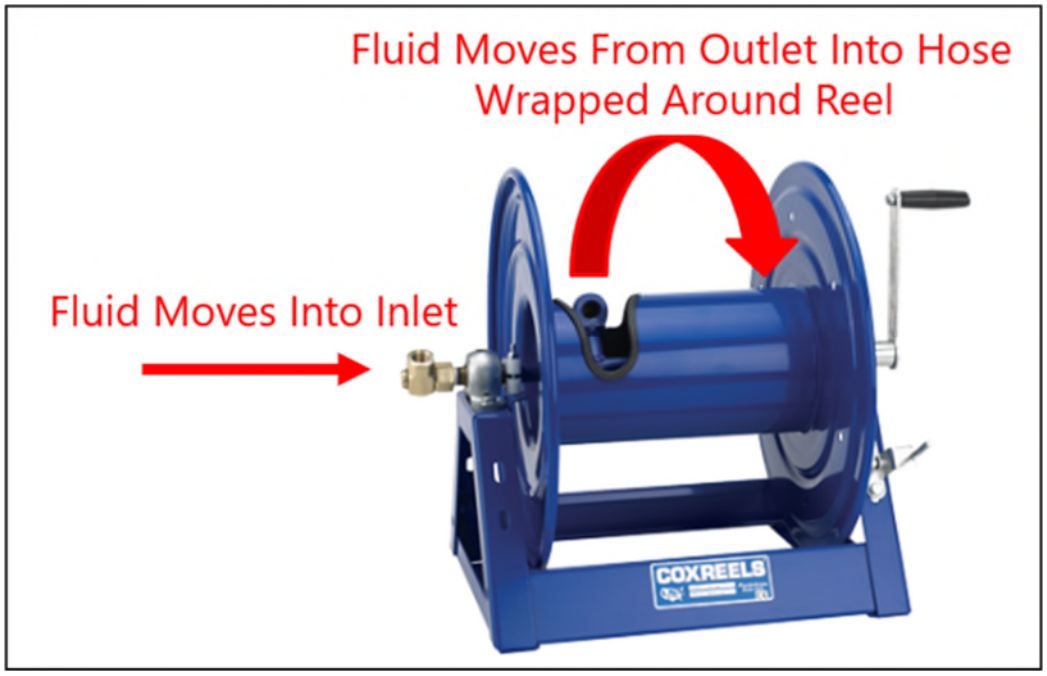

73. The Coxreels website also describes a "low profile outlet riser & open drum slot design for flat smooth hose wrap.":[62]

[61] EX1008, 1 (excerpted and annotated to show "external fluid path" with brass "swivel inlet.")

[62] EX1008, 1 (excerpted and annotated to show "outlet" and "drum slot.").


74. A POSITA would have recognized the "outlet riser" above, annotated in red, would have been the outlet, or discharge point, of fluid that flowed into the swivel inlet. A POSITA would have recognized that fluid in a system using Coxreels would be fluidly connected to the "external fluid path" via the brass inlet, pass through the reel body, and exit into a hose from the outlet made accessible by the "low profile outlet riser & open drum slot design."[63]

[63] EX1008, 1 (excerpted and annotated to show flow path).



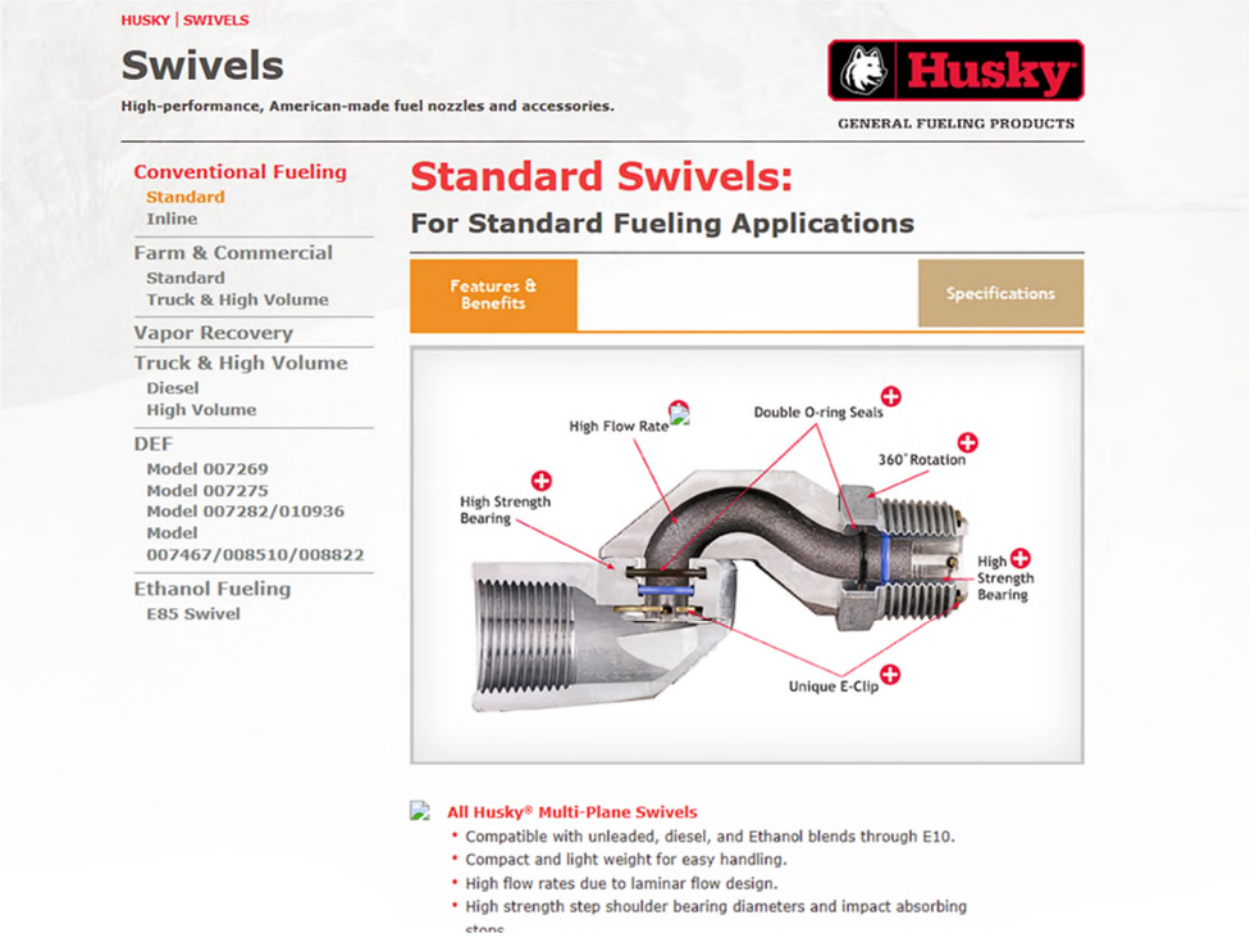

75. Further, a POSITA would have recognized the inlet port as a swivel joint (as described below) that allows the fluid to flow through the joint while the fitting is being rotated. Accordingly, a POSITA would have recognized as obvious fluidly connecting a manifold (upstream of the reel body) to hoses (downstream of the reel body) through a flow passage in the reel body.[64]

76. Inlet ports known as swivel joints, or sometimes referred to as a "rotatable coupling" for feeding fluid into the flow path of the reel and allowing the fluid to flow through the joint while the fitting is being rotated, would have been known to a POSITA.[65] One example of a commercially available swivel joint,

[64] EX1004, Fig. 1; see also EX1008, 1.

[65] EX1005, 4:33-36 & FIG. 5.

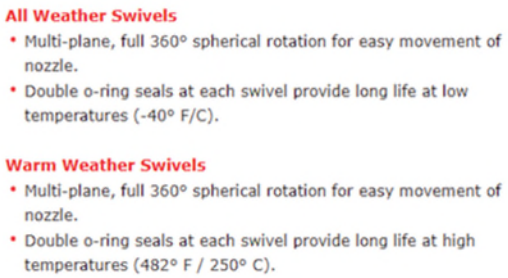
showing operation of the swivel joint, is the Husky general fueling products website.[66]




77. The Husky website teaches that fuel swivel joints were available at least by Mar 28, 2016. These swivel joints were compatible with "unleaded, diesel and Ethanol blends through E10." Further, the website teaches that the swivel joints have full 360° rotation.[67]

[66] EX1028.

[67] EX1028.



**All Weather Swivels**

- Multi-plane, full 360° spherical rotation for easy movement of nozzle.
- Double o-ring seals at each swivel provide long life at low temperatures (-40° F/C).

**Warm Weather Swivels**

- Multi-plane, full 360° spherical rotation for easy movement of nozzle.
- Double o-ring seals at each swivel provide long life at high temperatures (482° F / 250° C).

78. A POSITA would have recognized that swivel joints would have been used in fueling systems, and in particular on hose reels to allow for "full 360° spherical rotation" while the reel was winding or unwinding the hose stored thereupon.

### E. Fluid Level Sensors

79. Fluid level sensors were well-known in fuel delivery systems. For example, *Hockner* describes a "fill-level threshold sensor" in the context of measuring fuel in a tank: [68]

> Multiple tanks, i.e. fuel tanks **8**, are provided at a filling station, not illustrated in greater detail in FIG. 1. In each of these tanks **8a** fill-level threshold sensor **3** is provided that generates a signal when a predetermined level, preferably the maximum level, is reached in the respective tank **8**.
>
> These threshold sensors **3** may be known optical systems in which light is emitted, refracted in a defined manner on a glass prism on the probe, and reflected to a light sensitive element. When the liquid reaches the prism the index of refraction is altered, and less light or no light at all

[68] EX1015, [0012]-[0013].

is reflected to the light-sensitive element, whereupon a signal is outputted.

80. As another example, Frac Shack advertised its fuel delivery system on its website's "Technology" page as having "[w]ireless remote fuel level monitoring on every tank, in real time."[69]

### F. Area Classification/Fire Standards

81. Several industry codes and standards would apply to the design and construction of a mobile fuel distribution station, such as the one described in the prior art and the '805 Patent claims. These codes and standards would have been well-known to a POSITA and would serve to inform a POSITA regarding design and construction of facilities and equipment, in particular those facilities and equipment that handle or dispense combustible and flammable liquids, such as fuels. Some of the requirements of these codes and standards are discussed in the paragraphs below.

#### 1. NFPA 70 National Electrical Code (NEC)

82. NFPA 70, the National Electrical Code (NEC), provides, in Article 500, the definitions and requirements for equipment in classified (hazardous) areas. NFPA 70 is published by the National Fire Protection Association (NFPA). NFPA is a "leading information and knowledge resource on fire, electrical and related

[69] EX1017.

hazards."[70] NFPA standards, including NEC, were well known sources of information regarding installation of electrical systems to protect "persons and property from hazards arising from the use of electricity."[71] The NEC is regularly adopted by state, county, and municipal jurisdictions for governing installation of electrical systems in industrial, commercial, and residential locations. The version of the NEC in place at the time of the '805 Patent was published in 2014 ("NEC-2014"). A POSITA would have looked to NEC-2014 for information regarding the safe design and construction of electrical equipment, as discussed below.

83. NEC-2014 Chapter 5 addresses special requirements for "Special Occupancies." Included in the "Special Occupancies" are provisions for electrical installations in "Hazardous (Classified) Locations, Classes I, II and II, Divisions 1 and 2," addressed in Article 500 of NEC-2014. The Scope of Article 500 is shown below:[72]

500.1 Scope — Articles 500 Through 504.

Articles **500** through **504** cover the requirements for electrical and electronic equipment and wiring for all voltages in Class I, Divisions 1 and 2; Class II, Divisions 1 and 2; and Class III, Divisions 1 and 2 locations where fire or explosion hazards may exist due to flammable gases, flammable liquid–produced vapors, combustible liquid–produced vapors, combustible dusts, or ignitible fibers/flyings.

[70] *See* National Fire Protection Association, (https://www.nfpa.org/) (last accessed July 17, 2023.

[71] NEC-2014 Art. 90.1 "Purpose."

[72] NEC-2014 Art. 500.1.

84. Article 500 also defines Class I locations as those locations "in which flammable gases, flammable liquid-produced vapors, or combustible liquid-produces vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures."[73] Class I areas are divided into two divisions. A Class I Division 1 location is defined as an area:[74]

> **(1) Class I, Division 1.**
> A Class I, Division 1 location is a location
>
> (1) In which ignitible concentrations of flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors can exist under normal operating conditions, or
>
> (2) In which ignitible concentrations of such flammable gases, flammable liquid–produced vapors, or combustible liquids above their flash points may exist frequently because of repair or maintenance operations or because of leakage, or
>
> (3) In which breakdown or faulty operation of equipment or processes might release ignitible concentrations of flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors and might also cause simultaneous failure of electrical equipment in such a way as to directly cause the electrical equipment to become a source of ignition.

85. In contrast, a Class I Division 2 location is defined as follows:[75]

[73] NEC-2014 Art, 500.5 (B).

[74] NEC-2014 Art. 500.5(B)(1).

[75] NEC-2015 Art. 500.5(B)(2).

(1) In which volatile flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors are handled, processed, or used, but in which the liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems or in case of abnormal operation of equipment, or

(2) In which ignitible concentrations of flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors are normally prevented by positive mechanical ventilation and which might become hazardous through failure or abnormal operation of the ventilating equipment, or

(3) That is adjacent to a Class I, Division 1 location, and to which ignitible concentrations of flammable gases, flammable liquid–produced vapors, or combustible liquid–produced vapors above their flash points might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air and effective safeguards against ventilation failure are provided.

86. Areas that are hazardous (classified) areas require special electrical equipment. There are many methods of protection against ignition listed in NEC-2014, for example, explosionproof equipment, purged and pressurized equipment, intrinsically safe equipment, etc. Regardless of the protection technique used, the equipment must be identified for use in the Class/Division where it is installed. According to NEC-2014, suitability of equipment for use in a hazardous area shall be by one of the following:[76]

[76] NEC-2014 500.8(A).

**(A) Suitability.**
Suitability of identified equipment shall be determined by one of the following:

(1) Equipment listing or labeling

(2) Evidence of equipment evaluation from a qualified testing laboratory or inspection agency concerned with product evaluation

(3) Evidence acceptable to the authority having jurisdiction such as a manufacturer's self-evaluation or an owner's engineering judgment.

87. A POSITA would have understood that classified area equipment, which requires additional design, testing and listing requirements over and above "normal" area use equipment would be more expensive and, in many applications (such as conduit seals, etc.) more labor intensive to install. Other provisions and requirements for classified area equipment apply, and are listed in NEC-2014.

**2. International Fire Code**

88. The International Fire Code (IFC) is published by the International Code Council (ICC), which is a "leading global source of model codes and standards and building safety solutions that include product evaluation, accreditation, technology, training, and certification."[77] The IFC is a well-known source for information regarding safe design construction of facilities, in particular those facilities handling combustible or flammable liquids, such as fuels. The IFC is regularly adopted by state, county and municipal jurisdictions for governing fire

[77] *See* International Code Council, (https://www.iccsafe.org/about/who-we-are/) (last accessed July 17, 2023).

prevention, suppression, and elimination in industrial, commercial, and residential locations. The version of the IFC in place at the time of the '805 Patent was the 2015 version ("IFC-2015"). A POSITA would have looked to IFC-2015 for information regarding the safe design and construction of equipment used in refueling operations, as discussed below.

89. The Scope and intent of the IFC are contained in Chapter 1.[78]

**[A] 101.2 Scope.**

This code establishes regulations affecting or relating to structures, processes, premises and safeguards regarding all of the following:

1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices.
2. Conditions hazardous to life, property or public welfare in the occupancy of structures or premises.
3. Fire hazards in the structure or on the premises from occupancy or operation.
4. Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems.
5. Conditions affecting the safety of fire fighters and emergency responders during emergency operations.

**[A] 101.3 Intent.**

The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises, and to provide a reasonable level of safety to fire fighters and emergency responders during emergency operations.

Accordingly, IFC-2015 provides a resource of the knowledge of a POSITA at the time of the application which led to the '805 Patent.

90. Section 309 of IFC-2015 deals directly with "Powered Industrial Trucks and Equipment" and provides general information regarding these equipment. Section 309.5 deals directly with refueling of such equipment and states, in part, "Fixed fuel-dispensing equipment and associated fueling operations shall be

[78] International Code Council, Inc. "International Fire Code 2015 (IFC)." ICC, 2015., Chapter 1

in accordance with Chapter 23. Other fuel-dispensing equipment and operations, including cylinder exchange for LP-gas-fueled vehicles, shall be in accordance with Chapter 57 for flammable and combustible liquids or Chapter 61 for LP-gas."[79] Accordingly, a POSITA would have looked to Chapter 57 for information regarding "fuel dispensing equipment" (such as the refueling systems described in the prior art and the Challenged Patents) that handle "flammable and combustible liquids." IFC-2015 provides definitions of Flammable Liquids and Combustible Liquids as follows:[80]

**COMBUSTIBLE LIQUID.** A liquid having a closed cup flash point at or above 100°F (38°C). Combustible liquids shall be subdivided as follows:

**Class II.** Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).

**Class IIIA.** Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C).

**Class IIIB.** Liquids having closed cup *flash points* at or above 200°F (93°C).

The category of combustible liquids does not include *compressed gases* or *cryogenic fluids*.

**FLAMMABLE LIQUID.** A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows:

**Class IA.** Liquids having a flash point below 73°F (23°C) and having a *boiling point* below 100°F (38°C).

**Class IB.** Liquids having a *flash point* below 73°F (23°C) and having a *boiling point* at or above 100°F (38°C).

**Class IC.** Liquids having a *flash point* at or above 73°F (23°C) and below 100°F (38°C).

The category of flammable liquids does not include *compressed gases* or *cryogenic fluids*.

[79] IFC-2015 §309.5.

[80] IFC-2015 §202 General Definitions.

91. An example of a combustible liquid is diesel fuel, which has a flashpoint of around 126°F[81] and a boiling point between 304°F and 574°F.[82] Diesel would be characterized as a Class IIIB combustible liquid. An example of a flammable liquid would be gasoline, which has a flash point of around -45°F[83] and a boiling point of between 100°F and 400°F.[84] Gasoline would be characterized as a Class IB flammable liquid.

92. Chapter 57 of IFC-2015 deals with "Prevention, control and mitigation of dangerous conditions related to storage, use, dispensing, mixing and handling of flammable and combustible liquids"[85] Section 5703.1 of IFC-2015 deals with electrical installations around handling of flammable and combustible liquids. Section 5703.1.1 states, in part "Areas where flammable liquids are stored, handled,

[81] *See* Flash Point – Liquids, The Engineering toolbox, (https://www.engineeringtoolbox.com/flash-point-fuels-d_937.html) (last accessed July 17, 2023).

[82] *See* Fuels – Boiling Points, The Engineering Toolbox, (https://www.engineeringtoolbox.com/fuels-boiling-point-d_936.html) (last accessed July 17, 2023).

[83] *See Flash Point – Liquids, The Engineering toolbox, (https://www.engineeringtoolbox.com/flash-point-fuels-d_937.html) (last accessed July 17, 2023).*

[84] *See* Fuels – Boiling Points, The Engineering Toolbox, (https://www.engineeringtoolbox.com/fuels-boiling-point-d_936.html) (last accessed July 17, 2023).

[85] IFC-2015 §5701.1.

dispensed or mixed shall be in accordance with Table 5703.1.1. A classified area shall not extend beyond an unpierced floor, roof or other solid partition."[86] Table 5703.1.1 contains provisions which determine what area classification exists around certain types of equipment. Area classification is described in more detail in the section regarding NFPA 70 (National Electrical Code) below. All areas that are classified (hazardous) areas due to flammable or combustible liquids are considered "Class 1." Areas are classified by Divisions, where Div. 1 is an area where a flammable atmosphere may exist on a regular basis and Div. 2 is an area where a flammable atmosphere may exist during abnormal operations. Some area classification divisions applicable to the Challenged Patents are taken from Table 5703.1.1 and shown below:[87] All The numbers in the table have to do which division the area is classified.

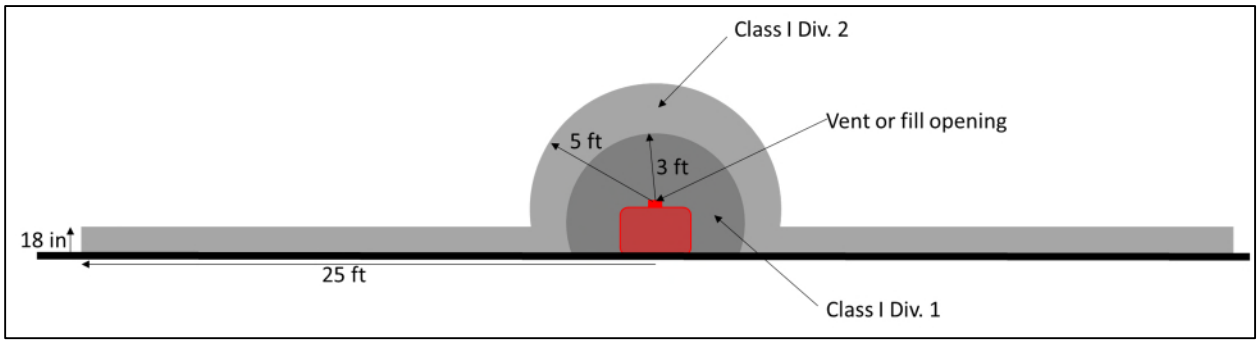
| **Drum and container filling** | | |
|---|---|---|
| Outdoor or indoor with adequate ventilation | 1 | Within 3 feet of vent and fill opening, extending in all directions. |
| | 2 | Area between 3 feet and 5 feet from vent of fill opening, extending in all directions. Also up to 18 inches above floor or grade level within a horizontal radius of 10 feet from vent or fill opening. |

[86] IFC-2015 §5703.1.1.

[87] IFC-2015 Table 5703.1.1.

| | | |
|---|---|---|
| **Pumps, bleeders, withdrawal fittings, meters and similar devices** | | |
| Indoor | 2 | Within 5 feet of any edge of such devices, extending in all directions, and up to 3 feet above floor or grade level within 25 feet horizontally from any edge of such devices. |
| Outdoor | 2 | Within 3 feet of any edge of such devices, extending in all directions, and up to 18 inches above floor or grade level within 10 feet horizontally from an edge of such devices. |
| **Pits** | | |
| Without mechanical ventilation | 1 | Entire area within pit if any part is within a Division 1 or 2 classified area. |
| With mechanical ventilation | 2 | Entire area within pit if any part is within a Division 1 or 2 classified area. |
| Containing valves, fittings or piping, and not within a Division 1 or 2 classified area | 2 | Entire pit. |
| **Drainage ditches, separators, impounding basins** | | |
| Indoor | 1 or 2 | Same as pits. |
| Outdoor | 2 | Area up to 18 inches above ditch, separator or basin, and up to 18 inches above grade within 15 feet horizontal from any edge. |
| **Indoor equipment where flammable vapor/air mixtures could exist under normal operations** | 2 | Area between 5 feet and 8 feet of any edge of such equipment, extending in all directions, ai the area up to 3 feet above floor or grade level within 5 feet to 25 feet horizontally from any edge such equipment.[c] |
| | 1 | Area within 3 feet of any edge of such equipment, extending in all directions. |
| **Outdoor equipment where flammable vapor/air mixtures could exist under normal operations** | 2 | Area between 3 feet and 8 feet of any edge of such equipment extending in all directions, ar the area up to 3 feet above floor or grade level within 3 feet to 10 feet horizontally from any edge such equipment. |

93. For example, around an area where drums or containers are filled, there is a Class I Div. 1 area that extends three feet from the vent or fill opening in all directions, and a Class I Div. 2 area that extends from 3 – 5 feet around the vent or fill opening, and up to 18” from the floor extending 10 feet from the vent or fill opening. The area would be represented by the Figure below.




94. Based on the information contained in Table 5703.1., an area classification would have been made by a POSITA to determine what protection or separation electrical equipment, including sources of ignition such as heaters, would need in the design and construction of fuel handling equipment.

95. Section 5703 contains further provisions regarding protection from spills.

**5703.4 Spill control and secondary containment.**

Where the *maximum allowable quantity per control area* is exceeded, and where required by Section 5004.2, rooms, buildings or areas used for storage, dispensing, use, mixing or handling of Class I, II and IIIA liquids shall be provided with spill control and secondary containment in accordance with Section 5004.2.

96. Section 5004.2, referenced by Section 5703.4, provides that spill control and secondary containment is required in areas used for the storage of hazardous material liquids in individual vessels having a capacity of more than 55 gallons (208 L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L). Accordingly, a POSITA would look to IFC-2015 for information regarding when and what type of spill control (e.g., floor plan) would be necessary in a fuel distribution station.

97. Section 5706 contains provisions for "special operations" which include the following activities[88]:

> **5706.1 General.**
>
> This section shall cover the provisions for special operations that include, but are not limited to, storage, use, dispensing, mixing or handling of flammable and *combustible liquids*. The following special operations shall be in accordance with Sections 5701, 5703, 5704 and 5705, except as provided in Section 5706.
>
> 1. Storage and dispensing of flammable and *combustible liquids* on farms and construction sites.
> 2. Well drilling and operating.
> 3. Bulk plants or terminals.
> 4. Bulk transfer and process transfer operations utilizing tank vehicles and tank cars.
> 5. Tank vehicles and tank vehicle operation.
> 6. Refineries.
> 7. Vapor recovery and vapor-processing systems.

98. If the distribution station is classified as a tank vehicle, this section demonstrates that the same provisions as discussed above still apply. There is nothing in Section 5706 to contradict the area classification requirements discussed above.

99. The use of walls or barricades to reduce the risk of ignition, and to protect electrical equipment from being in a flammable environment were well known at the time of the filing of the application which led to the '805 Patent. Multiple industry standards address the classification of facilities into various flammable (hazardous) atmospheres. With respect to oil and gas equipment, API RP 500, "Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2"

[88] IFC-2015 §5706.1.

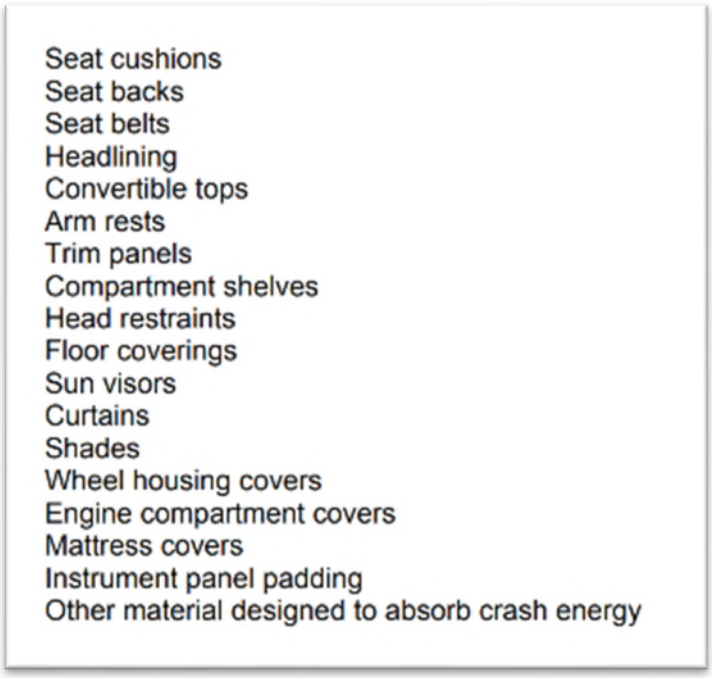
governs the classification of different facilities that use electrical equipment. Further, NFPA 497 "Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas" addresses similar, but not identical, requirements. Both documents address hazardous (classified) areas based on the requirements of the NEC, and in a similar manner to the IFC. These documents reinforce a POSITA's knowledge regarding protection of ignition from flammable atmospheres.

### G. Vehicle Fire Resistant Materials/Standards

100. The use of fire-retardant materials, including fire retardant insulation, was well-known long before the filing of the '805 Patent application. As one example, vehicle standards have required fire retardant materials for decades prior to the '805 Patent application. The US Department of Transportation (DOT) publishes vehicle safety standards under the guise of the National Highway Traffic Safety Administration (NHTSA). One of these standards, TP-302-03 contains requirements for the use of fire-retardant materials in the occupant compartment of motor vehicles.[89] This standard is promulgated to meet the requirements of 49 CFR §571.302 "Flammability of interior materials." The CFR section discloses "This standard specifies burn resistance requirements for materials used in the occupant

[89] US DOT NHTSA TP-302-03, "Laboratory Test Procedure for FMVSS-302 Flammability of Interior Materials," published Oct 18, 1991.

compartments of motor vehicles." Further, the regulation requires that "any portion of a single or composite material which is within 0.5 inches of the occupant compartment air space shall meet the requirements of the standard."[90] This includes, at the least, the following materials:[91]




101. A POSITA would have understood that any of the materials within 0.5 inches of the occupant compartment would include insulation materials used in the occupant compartment of a truck/trailer. Further, many of the materials specifically identified in the standard would provide insulation properties including, at least, "instrument panel padding," "Trip Panels," "Headlining" and the like. The Standard

[90] 49 CFR §571.302.S4.1, TP-302-03 p. 2.

[91] TP-302-3 pg. 2.

requires that such materials "shall not burn, nor transmit a flame front across its surface, at a rate of more than 4 inches per minute," which is a retarded flame front compared to unimpeded burn rates of such materials. Further, the standard allows "if a material stops burning before it has burned for 1 minute from the start of timing, and has not burned more than 2 inches from the point where timing was stared, it shall be considered to meet the burn-rate requirement of the standard."[92]

102. Further, not only were such fire-retardant insulation materials required by Federal standards, but such products were also commercially available long before the application which led to the '805 Patent. As one example, Heat Shield Products provided "Heat Shield and Thermal Barriers" at least by July 9, 2015.[93] Further, Heat Shield Products also provided sound insulation in the same time frame.[94] A POSITA would have understood that such products, offered to insulate the passenger compartment of the vehicle from heat and sound, would have complied with the federal requirements discussed above, which had been in place by decades at the time of the '371 application.

[92] TP-302-03 pg 2, 49 CFR §571.302.S4.3.

[93] *See e.g.* http://web.archive.org/web/20150709063744 /http://www.heatshieldproducts.com/automotive/heat-shield-and-thermal-barriers.

[94] *See e.g.*, http://web.archive.org/web/20150809142041 /http://www.heatshieldproducts.com/automotive/sound-insulation

## IX. LEVEL OF ORDINARY SKILL IN THE ART

103. I understand that the claims and specification of a patent must be read and construed through the eyes of a person of ordinary skill in the art ("POSITA") at the time of the priority date of the claims.

104. I have also been advised that to determine the appropriate level of a person having ordinary skill in the art, the following factors may be considered: (a) the types of problems encountered by those working in the field and prior art solutions thereto; (b) the sophistication of the technology in question, and the rapidity with which innovations occur in the field; (c) the educational level of active workers in the field; and (d) the educational level of the inventors.

105. It is my opinion that a person of ordinary skill in the art of the '805 Patent would have either (1) a Bachelor of Science in Mechanical Engineering, Electrical Engineering, Petroleum Engineering or an equivalent field as well as at least 2 years of academic or industry experience in the oil and gas industry, including well drilling, completion, or production, or (2) at least four years of industry experience in the oil and gas industry including well drilling, completion, or production. This definition is approximate, and more education may substitute for industry experience or vice versa.

106. Based on my educational and employment background, I am qualified to provide opinions concerning what a POSITA would have known and understood by October 11, 2016.

## X. OVERVIEW OF THE PRIOR ART

107. As explained below, it is my opinion that the following prior art reference discloses or renders obvious all technical features of the'805 Patent claims, thus rendering them unpatentable:

### A. *Van Vliet* (EX1004)

#### 1. Status of *Van Vliet*

108. *Van Vliet* is a publication of a United States patent application, U.S. Patent Publication No. 2011/0197988. *Van Vliet* entitled "Fuel Delivery System and Method." *Van Vliet* was filed February 6, 2011, and published August 18, 2011. Each of these dates is before the earliest possible priority date of all claims of the '805 Patent. *Van Vliet* was cited by the examiner during prosecution of the '805 Patent.[95]

#### 2. Summary of *Van Vliet*

109. *Van Vliet* describes "[f]uel delivery systems and methods," and more specifically, "[a] fuel delivery system and method" for equipment used in oil and gas well fracturing operations. The goal of *Van Vliet* is "reducing the likelihood that

[95] EX1011, 227.

a fuel tank of equipment at a well site during fracturing of a well will run out of fuel."[96]

110. *Van Vliet* describes "[e]equipment at a well site use[d] for a fracturing job may comprise several pumpers and blenders. A pumper **10** is shown in FIG. 1 with a fuel tank **12**. *Van Vliet* further describes "[a] fuel delivery system is provided for delivery of fuel to multiply fuel tanks **12** of multiple pieces of equipment 10 at a well site during fracturing of a well. Further, *Van Vliet* discloses "The fuel delivery system **14** may be contained on a single trailer," and is depicted in Figure 1.[97]

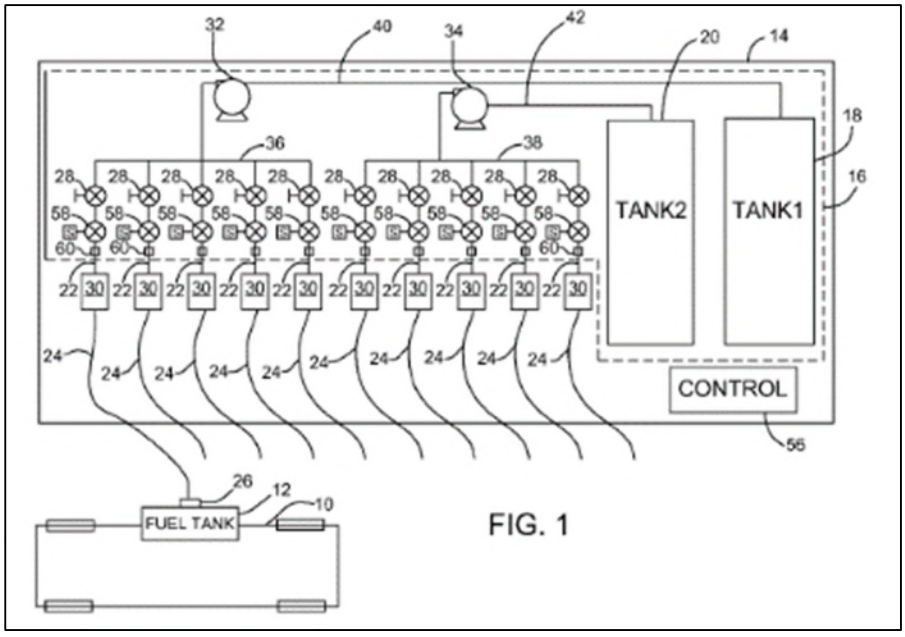



FIG. 1

111. In the above fuel delivery system **14**, tanks **18** and **20** "are used to store fuel." The tanks connect to pumps **32** and **34**, which further connect to manifold 36

[96] EX1004, Abstract, [0003].

[97] EX1004, [0014]; *id.*, FIG. 1.

and manifold 38 respectively. The manifolds connect to valves **28** and **58** "to control fluid flow through the hose **24** connected to each respective fuel outlet **22** to permit independent operation of each hose **24**." Each hose **24** is "preferably stored on a reel[] **30**. The reels **30** may be manual reels, or may be spring loaded." Each hose **24** connects to a fuel tank **12**, associated with a separate piece of equipment such as a fracturing pump engine. [98]

112. *Van Vliet* further describes "[e]ach hose **24** is connected to a fuel cap or full head **26** on a respective one of the fuel tanks **12** for delivery of fuel to the fuel tank **12** through the hose **24**."[99] Further, *Van Vliet* discloses "[e]ach cap 26 also preferable comprises a fuel level sensor **54**." This sensor "communicates with a control station **56** on the trailer **14** via a wireless communication channel, though a wired channel may also be used." The controller **56** starts fuel flow to the fuel tank **12** in response to a low-level signal from sensor **54** and stops fuel flow to the fuel tank **12** in response to a high-level signal from sensor **54**.[100]

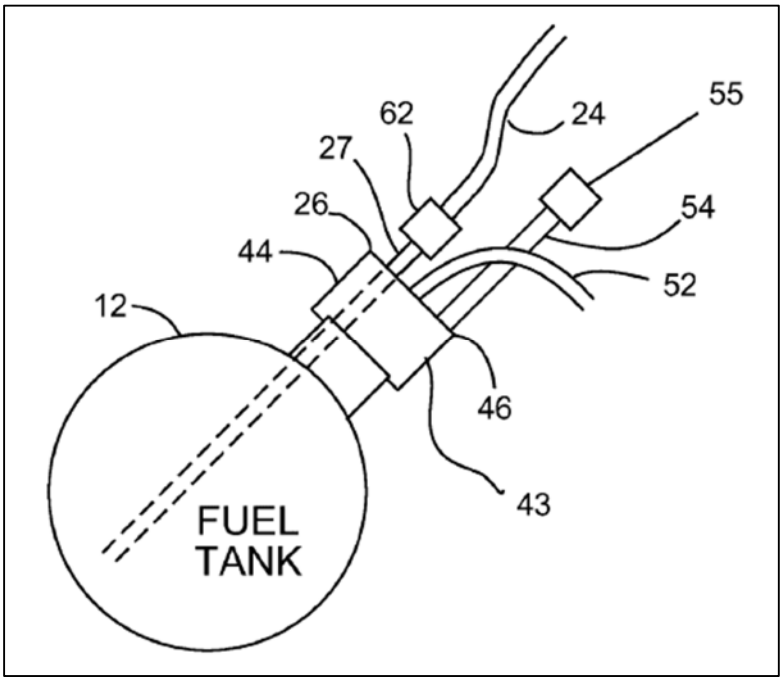
113. *Van Vliet* notes that "The spatial orientation of the reels **30**, manifolds **36** and **38**, tanks **18** and **20**, and other equipment shown "is a matter of design choice

[98] EX1004, FIG. 1; *see also id.*, [0015].

[99] EX1004, [0015].

[100] EX1004, [0020].

for the manufacturer and will depend on space requirements."[101] The connection between a hose **24** and a fuel tank **12** is depicted in a preferred embodiment shown in more detail in FIG. 2 from *Van Vliet* duplicated below:[102]




114. As depicted above, hose **24** connects to fuel tank **12**, which is coupled to fuel level sensor **54**. The fuel level sensor **52** detects a level of fuel within fuel tank **12** and communicates the fuel level to a controller **56** (not shown in the figure).[103] The controller **56** may be used to control pumps **32**, **34**, thereby allowing the fuel passing through hoses **24** to be responsive to fuel levels in fuel tanks **12**.

[101] EX1004, [0027].

[102] EX1004, FIG. 2.

[103] *See* EX1004, FIG. 2, *see also id.*, [0020].

### B. *Cable* (EX1005)

#### 1. Status of *Cable*

115. *Cable* is U.S. Patent no. 3,810,487. *Cable* is entitled "Mobile Lubrication Apparatus." The application which led to *Cable* was filed November 22, 1971, and the Patent was issued May 14, 1974. Each of these dates is before the earliest possible priority date of all claims of the '805 Patent.[104] *Cable* was not cited by the examiner during prosecution of the '805 Patent, nor is it listed as one of the references considered by the examiner during prosecution of the '805 Patent.[105]

#### 2. Summary of *Cable*

116. *Cable* describes "a mobile lubrication apparatus having a van truck with storage tanks mounted therein connected to pressure hoses." These hoses are part of an assembly which includes "four rotatably mounted reels with a hose wrapped around each reel." The hoses are pulled out from the reel "to allow lubrication of another vehicle."[106] The hoses and reels are mounted, along with supporting equipment, in a rear compartment of a van truck. Cable describes the van truck "having a driver compartment as well as a rear compartment."[107] The rear

[104] *See* EX1004 *generally*.

[105] *See* EX1004, Cover.

[106] EX1005, Abstract.

[107] EX1005, 2:51-52.

compartment of *Cable*'s van truck is shown in FIG. 1 and FIG. 2 from *Cable*, duplicated below:[108]

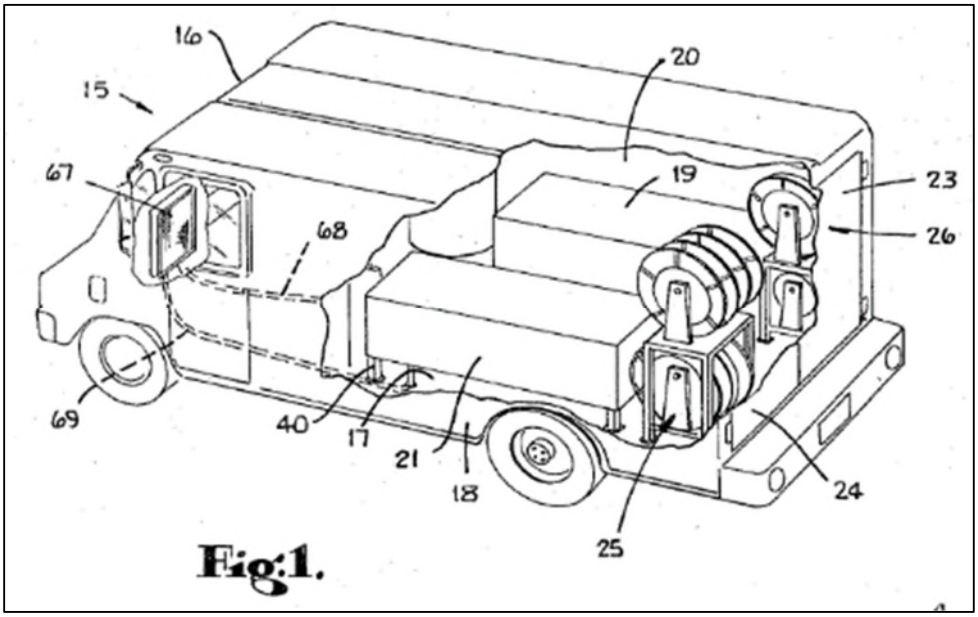



Fig.1.

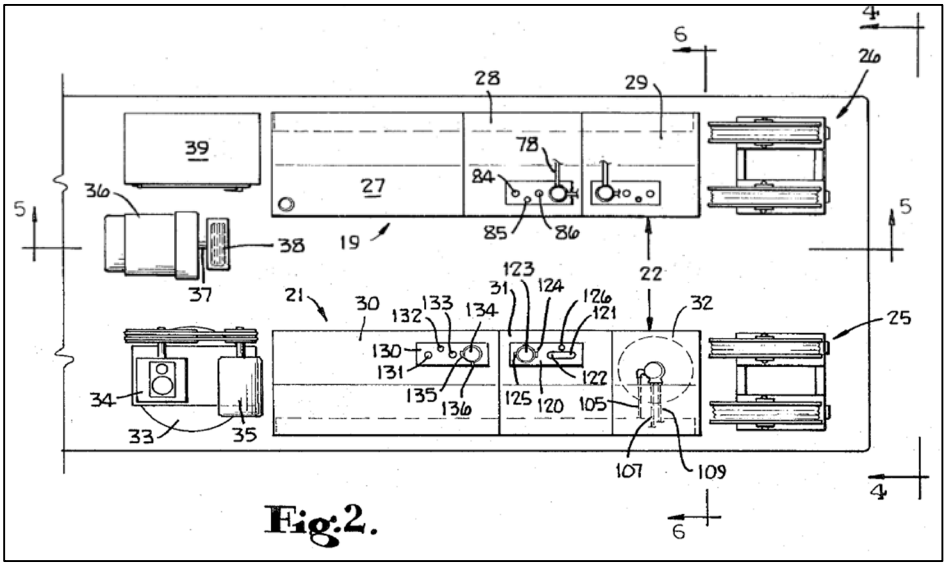



Fig.2.

[108] EX1005, FIG. 1, FIG. 2.

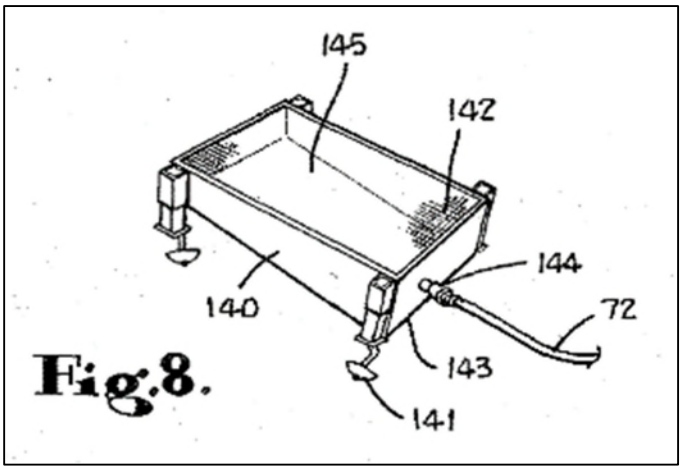
117. *Cable* describes the layout of the rear compartment to include "a row of tanks mounted to the truck platform adjacent each one of the two side walls of the truck." These on opposed side walls are spaced away from each other "forming a walkway and a storage area therebetween allowing a person to walk between the tanks from the driver compartment toward the back doors **23** and **24** which are hingedly mounted to the truck."[109] Also included in *Cable's* rear compartment are "pumps [which] are mounted atop the tanks…to force the contents of the tanks out through the hoses of the hose assemblies." Further, *Cable* discloses "[a] waste oil receiver may be positioned under the vehicle being lubricated to receive waste oil and is connected to a suction hose which conveys the waste oil back to a storage tank within the truck."[110] This receiver is described by *Cable* as "a generally rectangular-shaped container having an open top with a screen **142** extending theracross." According to *Cable*, "the oil received by container **140** will flow downwardly through coupling 144 and into waste soil suction hose **42**" which leads to oil waste storage tank **30**.[111] Waste oil receiver 140 is detailed in FIG. 8 of *Cable*, duplicated below:[112]

[109] EX1005, 2:56-62.

[110] EX1005, Abstract.

[111] EX1005, 6:36-53.

[112] EX1005, FIG. 8.




### C. *Lowrie (EX1006)*

#### 1. Status of Lowrie

118. *Lowrie* is a publication of a United States patent application, U.S. Patent Publication No. 2018/0057348. *Lowrie* is entitled "Refueling System and Method." *Lowrie* was filed Aug 3, 2017, and published March 1, 2018. *Lowrie* claims priority to Provisional Application No. 62/378,394 (EX1013), filed on Aug. 23, 2016. I have reviewed *Lowrie*'s provisional application in conjunction with the application of *Lowrie* in my analysis and provided parallel citation where appropriate. The Provisional Application date is before the earliest possible priority date of all claims of the '805 Patent.[113] *Lowrie* was not cited by the examiner during prosecution of the '805 Patent, nor is it listed as one of the references considered by the examiner during prosecution of the '805 Patent.[114]

[113] *See* EX1001 *generally*.

[114] *See* EX1001, Cover.

### 2. Summary of *Lowrie*

119. *Lowrie* describes "a refueling system and method for simultaneously refueling the fuel tanks of multiple pieces of machinery in the field."[115] *Lowrie* "relates generally to refueling systems and methods"[116] and more specifically to systems and methods for "simultaneously refueling the fuel tanks of multiple pieces of machinery in the field.[117]

120. *Lowrie* describes "a mobile tanker with at least one fuel supply tank configured to connect and supply a plurality of refueling hoses."[118] Each fuel hose "may be wound on a reel for storage, and pulled out for dispensing fuel to a receiving fuel tank at a work site **380**."[119] Lowrie further describes "open-close valve[s]" for controlling fuel flow to the machinery being fueled, and a "controller which is adapted a flow meter on each fuel line, and to detect when a mechanical open-close valve has been actuated to shut off the flow of fuel to a receiving tank." When such a condition is detected "the system engages a solenoid safety valve."[120]

[115] EX1006, Abstract.

[116] EX1006,Field of the Invention.

[117] EX1006, Abstract.

[118] EX1006.

[119] EX1006, [0037].

[120] EX1006, [0011].

121. *Lowrie* further describes "enclosures or cabinets at either end of the mobile tanker **100**, which cabinets **130**, **140** may enclose electrical power generators, batteries and controllers…for controlling varies components of the mobile tanker **100**."[121]

122. As shown in FIG. 1, these cabinets are separated from the reel storage area by a wall (annotated in red). There are also access doors at the end of the trailer, in what would be the end wall or rear of the trailer (annotated in blue). Also shown in FIG. 1, the reels **110** are arranged in upper, middle, and lower rows along the length of tanker **100**'s interior:[122]

[121] EX1006, [0034].

[122] EX1006, FIG. 1 (annotated).

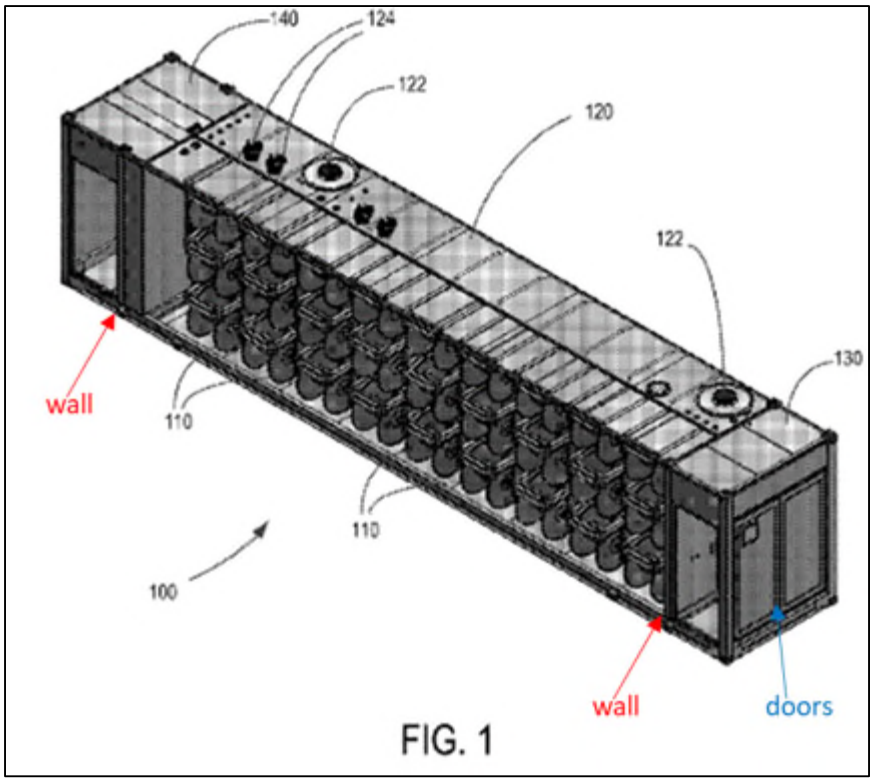


FIG. 1

### D. *AFD* (EX1007)

#### 1. Status of AFD

123. *AFD* is an archived webpage from September 22, 2015 describing the AFD Onsite Refueling System.[123] AFD Onsite Refueling ("*AFD*") was made available online at least as early as Sept. 22, 2015 as explained in the affidavit of the Internet Archive representative.[124] The public accessibility of *AFD* is established by the Internet Archive, Wayback Machine, which preserved *AFD* on September 22,

[123] EX1007.

[124] *See* EX1012. EX1012 includes a copy of EX1007 as Exhibit A. Where, I cite to EX1007, I incorporate by reference the corresponding disclosure of EX1012, Exhibit A and *vice versa*.

2015.[125] Exhibit 1012 includes an affidavit of Nathaniel E. Frank-White ("Frank-White Affidavit"), which attests to his role at the Internet Archive (which provides the Wayback Machine service) and the process used to archive webpages.[126] The Frank-White Affidavit explains the archiving process that preserves the date of archiving. *Id.* The Internet Archive assigns a URL to archived files in the format of http://web.archive.org/web/[Year in yyyy][Month in mm][Day in dd][Time code in hh:mm:ss]/[Archived URL].[127] Accordingly, the URL of:

http://web.archive.org/web/20150922012312/https:/www.afdpetroleum.com/fuel/onsite_refuelling

indicates that the page was archived on September 22, 2015, at 1:23:12. The foregoing demonstrates that *AFD* was publicly accessible no later than September 22, 2015.[128]

124. A POSITA interested in the subject matter of *AFD* could have located *AFD* through the exercise of ordinary diligence. For example, a POSITA would have

[125] *See* EX1012, Exhibit A.

[126] EX1012, 1-2.

[127] EX1012.

[128] I have personally navigated the archived links leading from the AFD homepage to the *AFD* reference using the Internet Archive's Wayback Machine to demonstrate how a POSITA at the time the filing of the '805 Patent could have accessed the *AFD* reference. However, I note that a POSITA at that time would have navigated the links on the AFD website itself (*i.e.*, directly, and not through the Wayback Machine service).

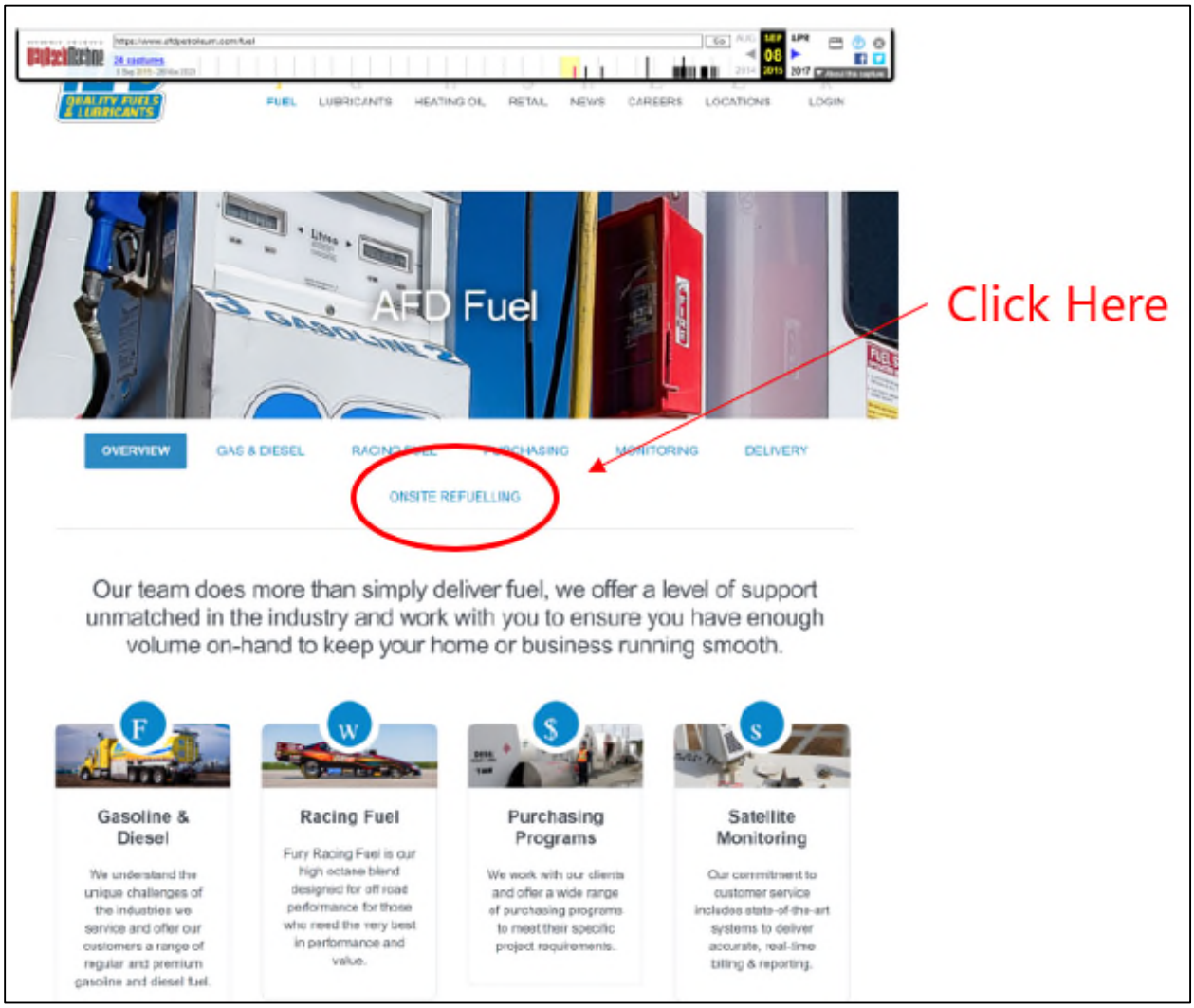
been aware of the AFD's website as a resource for products and information related to fueling.[129] To get to *AFD*, a POSITA visiting the AFD website would have clicked the "Fuel" link along the top of the homepage as shown below.[130]


[129] I understand that AFD was established in 1989 and became a leading independent supplier of bulk fuel, lubricants, and storage tanks across Western Canada, Alaska, and Texas. *See* EX1012, 12.

[130] EX1012, 11 (annotated).

This would take the POSITA to the "AFD Fuel" page.[131]

125. From the "AFD Fuel" page, the POSITA would click on "Onsite Refuelling" as shown below:[132]




[131] *See* EX1012, 12.

[132] EX1012, 8 (annotated).

126. This would take the POSITA to the *AFD* reference. Thus, by following logically labeled hyperlinks starting at the AFD home page, a POSITA was a mere two clicks from the *AFD* reference.

127. *AFD* therefore was publicly accessible prior to the earliest priority date of the Asserted Patents. *AFD* was not cited by the examiner during prosecution of the '805 Patent, nor is it listed as one of the references considered by the examiner during prosecution of the '805 Patent.[133]

**2. Summary of AFD**

128. An image of *AFD*'s system is provided below:[134]


129. The AFD Onsite Refueling System includes a trailer having a main compartment having 24 fuel reels, 24 hoses, a 10,000 L fuel tank. According to AFD, "The main fuel tank has an internal pump to attach to an alternative fuel source in

[133] *See* EX1001, Cover.

[134] EX1007 (excerpted); *see also* EX1012, Exhibit A.

attrition to connections to the 24 fuel reels."[135] Further, AFD discloses "[e]ach hose includes sensors and transmitters that generate real time data to the control room." According to AFD, "The control room contains two touch screen display monitors that control and provide fuel status for each reel and the main tank."[136] *AFD* shows hoses being deployed through the opposing sidewalls of the trailer.

### E. *Coxreels* (EX1008)

#### 1. Status of Coxreels

130. *Coxreels* is a website from April 8, 2014, describing the Coxreels 1125 Series hand crank and motorized hose reels.[137]


[135] EX1007.

[136] EX1007.

[137] EX1008.

131. Coxreels 1125 Series Hand Crank and Motorized Hose Reels ("*Coxreels*") was made available online at least as early as April 8, 2014, as explained in the affidavit of the Internet Archive representative.[138] The public accessibility of *Coxreels* is established by the Internet Archive, Wayback Machine, which preserved Coxreels on April 8, 2014.[139]. Exhibit 1030 includes an affidavit of Nathaniel E. Frank-White ("Frank-White Affidavit II"), which attests to his role at the Internet Archive (which provides the Wayback Machine service) and the process used to archive webpages.[140] The Frank-White Affidavit II explains the archiving process that preserves the date of archiving. The Internet Archive assigns a URL to archived files in the format of http://web.archive.org/web/[Year in yyyy][Month in mm][Day in dd][Time code in hh:mm:ss]/[Archived URL]. [141]Accordingly, the URL of:

https://web.archive.org/web/20140408035634/http:/www.coxreels.com/products/hand-crank/1125-series

[138] *See* EX1030. EX1030 includes a copy of EX1008 as Exhibit A. Where, I cite to EX1008, I incorporate by reference the corresponding disclosure of EX1030, Exhibit A and *vice versa*.

[139] *See* EX1030.

[140] EX1008, 1-2

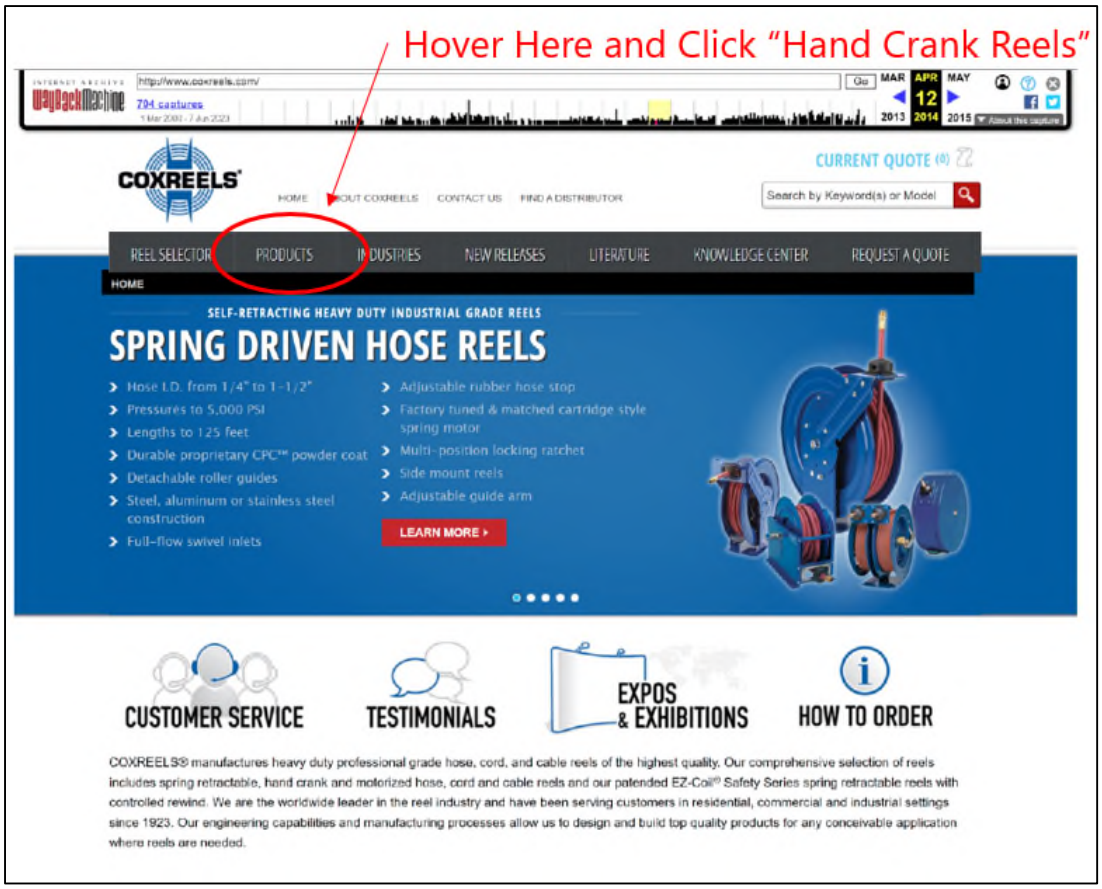
[141] EX1008.

indicates that the page was archived on April 8, 2014, at 3:56:34.[142] The foregoing demonstrates that *Coxreels* was publicly accessible no later than April 8, 2014.[143]

132. A POSITA interested in the subject matter of *Coxreels* could have located *Coxreels* through the exercise of ordinary diligence. For example, a POSITA would have been aware of the Coxreels' website as a resource for products and information related to hoses and reels—including in the context of fueling. To get to *Coxreels*, a POSITA visiting the Coxreels' website would have hovered over the "Products" link and clicked on the "Hand Crank Reels" option that appears.

[142] EX1008.

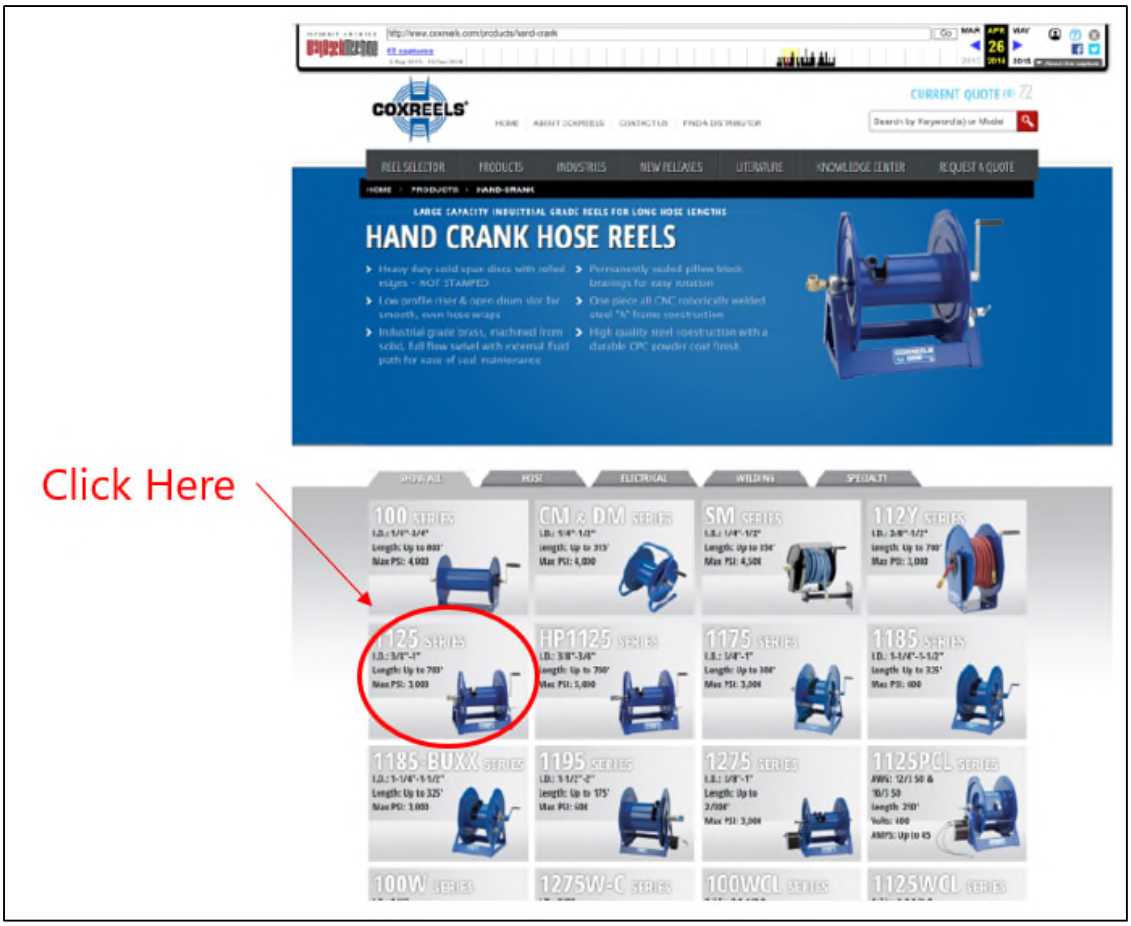
[143] I have personally navigated the archived links leading from the Coxreels homepage to the Coxreels reference using the Internet Archive's Wayback Machine to demonstrate how a POSITA at the time the filing of the '805 Patent could have accessed the AFD reference. However, I note that a POSITA at that time would have navigated the links on the Coxreels website itself (i.e., directly, and not through the Wayback Machine service).




EX1030, 14 (annotated). This would take the POSITA to the "Hand Crank Hose Reels" page.[144]

133. From the "Hand Crank Hose Reels" page, the POSITA would click on "1125 Series" as shown below:

[144] *See* EX1008.



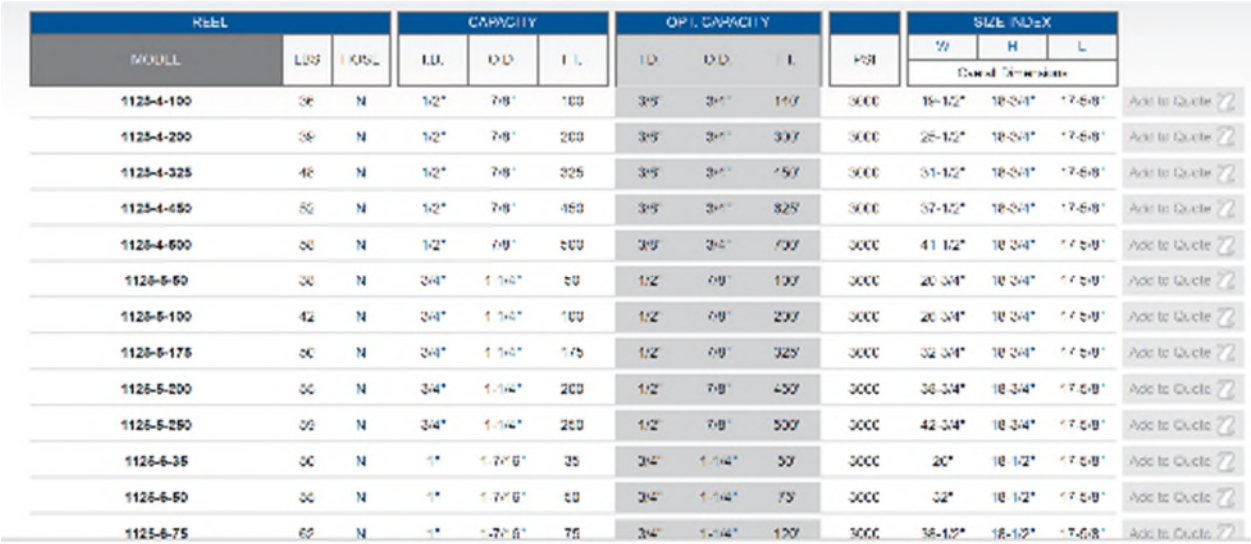

EX1030, 11 (annotated). This would take the POSITA to the *Coxreels* reference. Thus, by following logically labeled hyperlinks starting at the Coxreels' home page, a POSITA was a mere two clicks from the *Coxreels* reference.

134. *AFD* therefore was publicly accessible prior to the earliest priority date of the Asserted Patents. *AFD* was not cited by the examiner during prosecution of the '805 Patent, nor is it listed as one of the references considered by the examiner during prosecution of the '805 Patent.[145]

[145] *See* EX1001, Cover.

### 2. Summary of Coxreels

135. The *Coxreels*' 1125 reels come in various heights and widths; the length/diameter of each reel is 17 and 5/8 inches. A portion of the table from *Coxreels* showing an example of the sizes of reels available at the time of *Coxreels* is duplicated below. [146]



| Reel | | | Capacity | | | Opt. Capacity | | | | Size Index | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | LDS | HDSL | I.D. | O.D. | F.L. | I.D. | O.D. | L | PSI | W | H | L | |
| | | | | | | | | | | Overall Dimensions | | | |
| 1125-4-100 | 36 | N | 1/2" | 7/8" | 100 | 3/8" | 3-1/2" | 110' | 3000 | 16-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-4-200 | 36 | N | 1/2" | 7/8" | 200 | 3/8" | 3-1/2" | 300' | 3000 | 25-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-4-325 | 48 | N | 1/2" | 7/8" | 325 | 3/8" | 3-1/2" | 450' | 3000 | 31-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-4-450 | 60 | N | 1/2" | 7/8" | 450 | 3/8" | 3-1/2" | 625' | 3000 | 37-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-4-600 | 60 | N | 1/2" | 7/8" | 600 | 3/8" | 3-1/2" | 700' | 3000 | 41-1/2" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-5-50 | 36 | N | 3/4" | 1-1/4" | 50 | 1/2" | 7/8" | 100' | 3000 | 20-3/4" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-5-100 | 42 | N | 3/4" | 1-1/4" | 100 | 1/2" | 7/8" | 200' | 3000 | 26-3/4" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-5-175 | 60 | N | 3/4" | 1-1/4" | 175 | 1/2" | 7/8" | 325' | 3000 | 32-3/4" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-5-200 | 60 | N | 3/4" | 1-1/4" | 200 | 1/2" | 7/8" | 450' | 3000 | 38-3/4" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-5-250 | 60 | N | 3/4" | 1-1/4" | 250 | 1/2" | 7/8" | 500' | 3000 | 42-3/4" | 18-3/4" | 17-5/8" | Add to Quote |
| 1125-6-35 | 36 | N | 1" | 1-7/8" | 35 | 3/4" | 1-1/4" | 50' | 3000 | 20" | 18-1/2" | 17-5/8" | Add to Quote |
| 1125-6-50 | 36 | N | 1" | 1-7/8" | 50 | 3/4" | 1-1/4" | 75' | 3000 | 22" | 18-1/2" | 17-5/8" | Add to Quote |
| 1125-6-75 | 60 | N | 1" | 1-7/8" | 75 | 3/4" | 1-1/4" | 100' | 3000 | 36-1/2" | 18-1/2" | 17-5/8" | Add to Quote |

146 EX1008.

distribution, was well known to me, and would have been well known to a POSITA, at the time of the ’805 Patent.

## XI. ASSERTED GROUNDS OF INVALIDITY

### A. Ground 1: Claims 1-22 are rendered obvious by *Van Vliet* in view of *Cable*

#### 1. Rationale and Motivation for Combining *Van Vliet* and *Cable*

137. As discussed above in Sections X.A.2 and X.B.2, both *Van Vliet* and *Cable* describe a mobile truck/trailer system for delivery of fuel, lubricants or other hydrocarbons. Further, both references use deployable hoses stored on reels, arranged so that multiple hoses can deliver fuel or other fluids to the receiving equipment at the same time. In both references, to deliver the fluids, the hoses are “pulled out” from the reels and extending to the receiving equipment, and then “reeled up” onto the reels for storage or transportation. A POSITA would have found it obvious to combine *Cable* and *Van Vliet* at least due to their commonalities. Further, a POSITA would have been motivated to apply *Cable*’s teaching of a walkable reel deployment compartment with a central aisle walkway, and reels deployed on opposing sides of the walkway adjacent to the sidewalls, to the trailer of *Van Vliet* to allow *Van Vliet*’s system to be more easily traversable by operators for the purpose of repairs, maintenance, and/or physical inspection. Further, a POSITA would have been motivated to apply *Cable’s* teaching of an occupant compartment separated by an interior wall, and accessible via the interior walkway

(and exterior doors at the rear of the truck/trailer) at least to provide a separate occupant compartment without direct exposure to the fluids stored in the compartment with tanks.

138. Both *Van Vliet* and *Cable* are in the same field of endeavor and directed to solving the same problem as each other and the '805 Patent—distributing hydrocarbon fluids—and are therefore analogous art both to each other and to the '805 Patent claims. [147]The references are similar. Both *Van Vliet* and *Cable* include (1) storage tanks;[148] (2) reels;[149] (3) hoses on the reels;[150] (4) pumps coupled to the storage tanks;[151] and (5) valves for controlling the flow of a fluid. [152] Both references describe the combination of these individual elements in a similar manner to deliver fluids to equipment not located on the truck/trailer.[153] While *Van Vliet* is largely silent on the details of the physical arrangement of components in its trailer, instead leaving the arrangement up to the designer, *Cable* provides such details of physical orientation including a central walkway, reels arranged on opposed sides of the

[147] EX1001, 1:22-35; *see also* EX1004, [0003], [0014], Abstract; EX1005, 1:40-65.
[148] EX1004, [0003], [0014]; *see also* EX1005, 1:40-65.
[149] EX1004, [0014], [0015]; *see also* EX1005, 1:40-65.
[150] EX1004, [0014], [0015]; *see also* EX1005, 1:40-65.
[151] EX1004, [0014]; *see also* EX1005, 1:40-65.
[152] EX1004, [0003], [0014]; *see also* EX1005, 4:22-46.
[153] EX1004, [0014]; *see also* EX1005 Abstract, 1:62-65.

walkway adjacent to sidewalls, orientation of pumps and manifolds, use of stacked rows of reels arranged on racks, and the like. A POSITA would have recognized the advantages of the central aisle with equipment located on opposed sides of the aisle, for example to easily traverse the tank compartment for maintenance or operations. Further, a POSITA would have recognized the advantage of locating equipment on both sides of the aisle to make delivery of fluids to vehicles in multiple locations (such as on both sides of the trailer) easier and more efficient. *Van Vliet* already teaches that "one manifold **36** may supply fluid to equipment **10** lined up on one side of a well, while another manifold **38** may supply fluid to equipment **10** lined up on the other side [of the well]." [154] A POSITA would have recognized the obvious benefits of the spatial orientation taught by *Cable* so that reel equipment on one side of the well (such as the passenger's side of the vehicle) are fueled from reels on the same side of the vehicle, while equipment on the other side of the well is fed from reels on the opposed side of the vehicle. This would allow the vehicle to be backed or pulled in directly opposite the well and allow for deployment of hoses to equipment on both sides of the well with limited crossing or tangling of hoses.

139. Further, *Van Vliet* contains an express motivation to combine. *Van Vliet* states that "[t]he manual valves **28** should be readily accessible to an operator on the

[154] EX1004, [0024].

trailer **14**. This can be arranged with the manifolds **36**, **38** mounted on a wall of the trailer with the outlets **22** extending inward of the trailer wall."[155] To the extent that *Van Vliet* does not explicitly disclose an central aisle for access to the valves, *Van Vliet* does note that the spatial orientation of the reels **30**, manifolds **36** and **38**, tanks **18** and **20**, and other equipment shown "is a matter of design choice for the manufacturer and will depend on space requirements."[156] A POSITA would then look to other references, such as *Cable* for spatial configurations that allow for various equipment, such as valves, manifolds and pumps to be "readily accessible" as taught by *Van Vliet*. A POSITA, reading *Cable* would have easily understood that an aisle walkway, such as the one taught by *Cable* would be an effective and simple way to allow an operator easy access to manual valves inside the trailer, as taught by *Van Vliet*. A POSITA would have further understood that an outside door would be useful for accessing the aisle walkway from the outside of the trailer, and an inside door would be useful for accessing the aisle walkway from the driver's compartment or control cabin.[157] Further, a POSITA would have understood that separating the compartment with tanks, valves and hoses from the occupant compartment, such as

[155] EX1004, [0026].

[156] EX1004, [0027].

[157] *See* EX1004, [0031].

taught in *Cable* would not only be a conventional way of arranging a vehicle,[158] but would further have the advantage of separating the occupant from the combustible liquids contained in the tanks, and would keep any spills from directly impacting equipment, such as electrical or electronic equipment (e.g. *Van Vliet's* controller). Lastly, a POSITA would have understood that positioning the reels on either side of the aisle walkway would allow an operator to access more reels at any given location on the walkway than a configuration with reels on only one side of the walkway. Accordingly, a POSITA would have been motivated to modify *Van Vliet*'s system to include *Cable*'s aisle configuration to be more easily traversable on foot and would have been motivated to incorporate *Cable's* door and wall configuration to gain the advantages of such a configuration described above.

140. A POSITA would have had a reasonable expectation of success in combining *Van Vliet* with *Cable*. As explained above, *Van Vliet* and *Cable* describe similar systems for delivering fluid from a mobile trailer via hoses to multiple destinations. Further, the elements incorporated into *Van Vliet* from *Cable* are either already present in *Van Vliet* (*e.g.*, reels) or were simple elements well-known in the art at the time of the '805 Patent. Incorporating *Cable*'s aisle walkway, doors, and reel configuration into *Van Vliet*'s mobile fuel delivery system would merely involve

[158] *See* EX1005 2:49-51 ("there is shown a conventional van truck 16 having a driver compartment as well as a rear compartment.").

combining prior art elements according to known methods to yield predictable results.

### 2. Claim 1

141. For the reasons discussed in the sections below, the combination of *Van Vliet* and *Cable*, along with the knowledge of a POSITA regarding industry Codes, Standards and Regulations renders obvious Claim 1.

#### a. Claim 1[p]: "A distribution station comprising:"

142. To the extent the preamble is limiting, each of *Van Vliet* and *Cable* discloses "[a] distribution station."[159], [160] *Van Vliet* discloses "a fuel delivery system [that] may be contained on a single trailer."[161] *Cable* discloses a "mobile lubrication system" contained within a van truck for providing lubrication fluids to vehicles.[162] A POSITA would have recognized that the "fuel delivery system" of *Van Vliet* and the "mobile lubrication system of *Cable*" to each be "distribution stations" as the preamble claims. Accordingly, each of *Van Vliet* and *Cable* discloses a distribution station.

[159] I understand that the preambles may not be limiting. However, I include analyses of preambles for Claim 1 and Claim 17 out of an abundance of caution.

[160] EX1004, [0003], [0014]; *see also* EX1005, 1:41-65.

[161] EX1004, [0014].

[162] EX1005, 1:41-65.

143. For at least these reasons, a POSITA would have recognized that *Van Vliet* and *Cable* each disclose the preamble.[163] Accordingly, the preamble is obvious over *Van Vliet* in view of *Cable*.

**b. Claim 1[a]: "a mobile trailer"**

144. *Van Vliet* discloses "a mobile trailer."[164] More specifically, *Van Vliet* describes "a fuel delivery system 14" that "may be contained on a single trailer, or parts may be carried on several trailers or skids." [165] For at least these reasons, a POSITA would have recognized that Van Vliet discloses "a mobile trailer" as claimed in the '805 Patent.[166]

145. Similarly, *Cable* discloses a "mobile lubrication system" contained within a van truck.[167] Cable's van truck is depicted in FIG. 1, provided below:[168]

[163] *See* EX1004, [0003], [0014]; *see also* EX1005, 1:41-65.

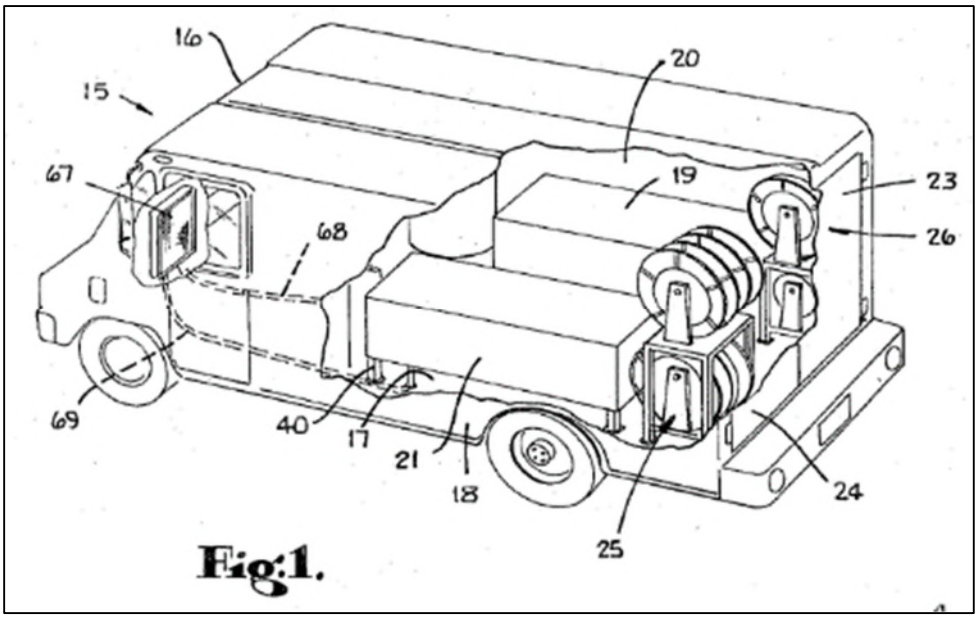
[164] EX1004, [0014].

[165] EX1004, [0014].

[166] See EX1004, [0003], [0014]; see also EX1005, 1:41-65.

[167] EX1005, 1:41-65.

[168] EX1005, FIG. 1; *compare* EX1001, 3:35-44.




146. Like the example of a mobile trailer depicted in the '805 Patent, *Cable*'s van truck is a mobile wheeled ground vehicle with a rear compartment that includes walls, a closed top, and a width.[169] From a functional standpoint, there is no significant difference between the teachings of a trailer and a van truck. A POSITA would have understood that the van truck of *Cable* provides the same function as the trailer in *Van Vliet* and the '805 Patent. As an example, both the trailer (with a tractor to pull it) and the van truck transport equipment and materials from location to location. Further, both the trailer and the van truck protect equipment from the elements and allow operators to work with the equipment so protected. Finally, both the van truck and the trailer provide walls, for example side walls, for mounting

[169] *See* EX1001, 3:35-44; *see also* EX1005, FIG. 1.

equipment in a desired spatial orientation. A POSITA would have understood that *Cable's* van truck would be interchangeable with a mobile trailer, for example, a trailer as disclosed in *Van Vliet*, and that an internal layout like that shown in the rear compartment of the van truck in *Cable* could be used in the trailer of *Van Vliet*. Accordingly, *Van Vliet* discloses, and the combination of *Van Vliet* and *Cable* renders obvious the limitations of Claim 1[a].

**c. Claim 1[b]: "a pump on the mobile trailer"**

147. *Van Vliet* discloses "a pump on the mobile trailer." As discussed above, *Van Vliet* teaches "the fuel delivery system **14** may be contained on a single trailer."[170] As shown in FIG. 1 of *Van Vliet*, the fuel delivery system **14** includes tanks **18** and **20** that are each "connected to respective pumps **32**, **34** and then to respective manifolds **36**, **38** via lines **40**, **42**. The fuel outlets **22** are located on the manifolds **36**, **38**." [171]

[170] EX1004, [0014].

[171] EX1004, [0016].

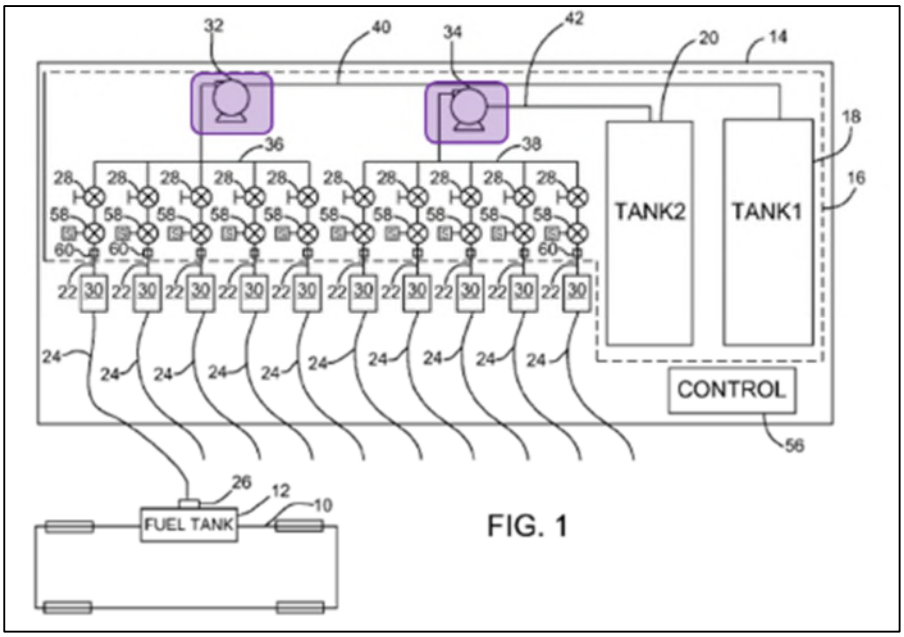



FIG. 1

148. Because pumps **32**, **34** are part of the "fuel delivery system **14**" that "may be contained on a single trailer," they are, either individually or together, "a pump on the mobile trailer."[172] Similarly, *Cable* discloses " [a] mobile lubrication apparatus having a van truck with storage tanks mounted therein," and "pumps are mounted atop the tanks [] to force the contents of the tanks out through the hoses of the hose assemblies."[173] A POSITA would have understood that the pumps in both *Van* Vliet and Cable are mounted on the trailer (or, equivalently, the van truck.) and provides the same function, i.e. pumping fluids out of the tanks into the discharge lines. Accordingly, both *Van Vliet* and *Cable*, disclose limitation 1[b] individually

[172] EX1004, [0008], [0014], FIG. 1 (annotated to show pumps in purple).

[173] EX1005, Abstract; *see also id.*, 4:47-67, FIG. 5 (describing pumps 88 and 92 mounted to tanks 28 and 29).

or in combination, and the combination of *Van Vliet* and *Cable* renders the claim limitation obvious.

**d. Claim 1[c]: "first and second manifolds on the mobile trailer and fluidly connected with the pump,"** [174]

149. *Van Vliet* discloses "first and second manifolds on the mobile trailer and fluidly connected with the pump." *Van Vliet* describes that the fuel delivery system **14** includes "one or more manifolds with associated pumps and fuel line or lines."[175,176]

[174] I have applied *Van Vliet* to the claimed "manifolds" based on its use of the same terminology as the '805 Patent claims. I also understand that Patent Owner has alleged in a pending lawsuit against Petitioners that certain structures in the systems accused of infringing the '805 Patent constitute "manifolds." I have considered those allegations in my analysis applying the disclosures of *Van Vliet* to the claimed "manifolds." However, I do not concede that any other structure, even one having a schematic like that shown or described in *Van Vliet*, would be considered a "manifold" by a POSITA, absent the information described above.

[175] EX1004, [0003].

[176] EX1004, FIG. 1 (annotated to show manifolds in blue).

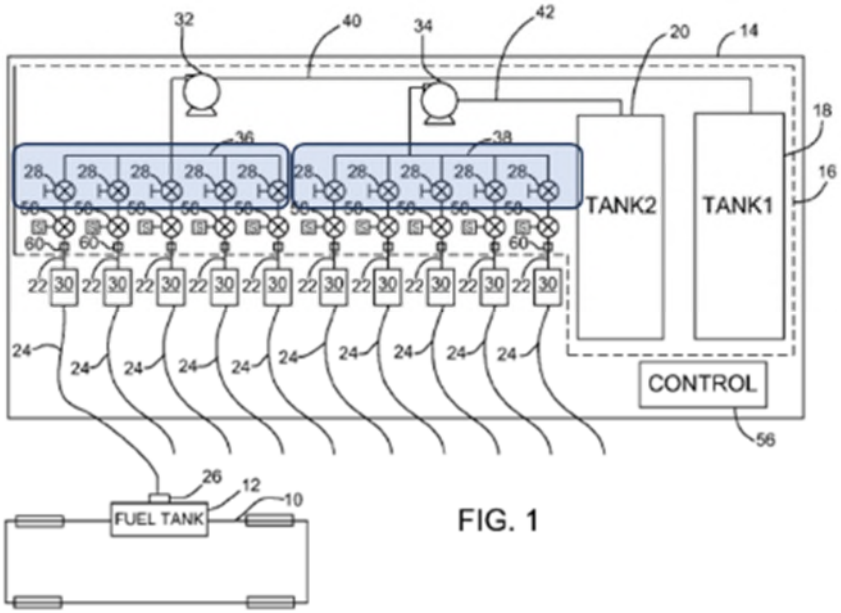



FIG. 1

150. In the schematic shown in FIG. 1,[177] manifolds **36** and **38** are connected to pumps **32** and **34**.[178] Further, in describing Figure 1, *Van Vliet* discloses "each tank **18**, **20** is connected to respective pumps **32**, **34** and then to respective manifolds **36**, **38** via lines **40**, **42**."[179]A POSITA would have understood that the connection between *Van Vliet's* manifolds and the associated pumps would be a fluid connection because the pumps and manifold distribute liquid fuel (*i.e.*, a fluid). Accordingly, a POSITA would have understood that *Van Vliet* discloses limitation 1[c].

[177] A schematic in this context is a high-level representation and is not intended to depict the physical appearance or form. *See* EX1022 (describing the definition of schematic as "represented in simplified or symbolic form").

[178] EX1004, [0015], FIG. 1.

[179] EX1004, [0016].

151. Alternatively, to the extent that claim 1[c] requires that both the first and second manifolds be connected to a single pump, modifying *Van Vliet* to connect manifolds **36** and **38** to a single pump would be an obvious design choice for a POSITA to implement, and a POSITA would have been motivated to do so, for example, to minimize the amount of components needed in *Van Vliet*'s system. Further, *Van Vliet* teaches that, in an embodiment, "the fuel outlets **22** may each be supplied fuel through a corresponding pump, one pump for each outlet **22** []. However, using a manifold **36**, **38** makes for a simpler system."[180] A POSITA would have understood to take the teaching of Van Vliet to the next step, using multiple manifolds with a single pump makes for an even simpler system, and one with fewer components (i.e., pumps and valves). Accordingly, the limitations of Claim 1[c] are disclosed, or at the least rendered obvious, by *Van Vliet* and the combination of *Van Vliet* and *Cable* render the limitations of Claim 1[c] obvious.

**e. <u>Claim 1[d]: "a plurality of reels on the mobile trailer,"</u>**

152. *Van Vliet* and *Cable* each disclose "a plurality of reels on the mobile trailer." In Van Vliet's fuel delivery system **14** of FIG. 1, "[t]he hoses **24** are

[180] EX1004, [0016].

preferably stored on reels **30**."[181] Accordingly, *Van Vliet* discloses "a plurality of reels on the mobile trailer."[182] [183]

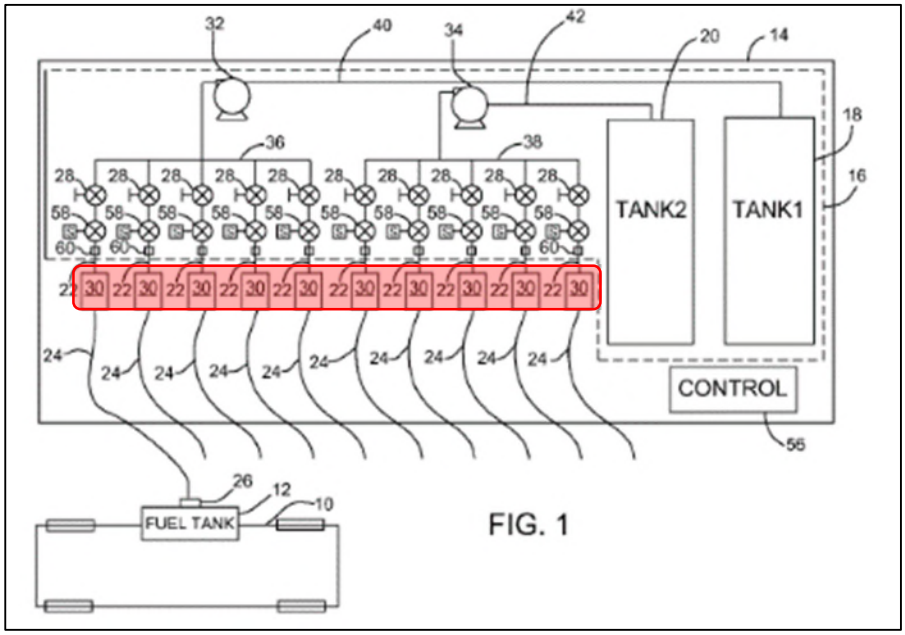



FIG. 1

153. Similarly, *Cable* discloses "a van truck" having two hose assemblies **25** and **26** mounted on a platform. Each of the hose assemblies includes a pair of upper reels and lower reels rotatably mounted to the frame of a wheel assembly.[184] The reels and hoses of both *Van Vliet* and *Cable* have the same purpose, to allow the hoses to be extended from the trailer to the equipment being serviced, and then to

[181] EX1004, [0015].

[182] *See* EX1004, [0008], [0014].

[183] EX1004, FIG. 1 (annotated to show reels 30 highlighted in red).

[184] EX1005, 2:63-3:5, FIGS. 1, 2, 4 and 5 (showing reels on hose assemblies 25 and 26); *see also id.*, Abstract.

allow the hoses to be rolled up on the reels for more efficient storage and transportation. Accordingly, a POSITA would have understood that each of *Van Vliet* and *Cable*, either together or in combination, disclose Claim limitation 1[d] and accordingly render the claim obvious.

**f. Claim 1[e]: "a plurality of hoses connected, respectively, with the reels, wherein a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold"**

154. *Van Vliet* discloses a plurality of hoses, with one hose **24** stored on and extending from each reel **30**: "The hoses **24** are preferably stored on reels **30**. The reels **30** may be manual reels or may be spring loaded."[185] *Cable* also discloses hoses that are wrapped around each of the rotatably mounted reels: A pair of hose assemblies are mounted adjacent to the rear door of the truck with each assembly having four rotatably mounted reels with a hose wrapped around each reel." [186] Accordingly, *Van Vliet* and *Cable* both disclose "a plurality of hoses connected, respectively, with the reels." Claim 1[e] (and related claim 17[e]) do not require that the hoses or the manifolds are *fluidly* connected with or through the reels, nor does the '805 Patent claim such an arrangement. Indeed, claims 1[c] and 17[c] separately

[185] *See* EX1004, [0015].

[186] EX1005, Abstract.

and expressly recites that the first and second manifolds are "fluidly connected with" the pump, and the '805 Patent's disclosure of how the hoses are "connected with" the reels mirrors that of *Van Vliet* and *Cable*.[187] However, to the extent Patent Owner argues that the claimed hoses or manifolds must be fluidly connected with the reels, such an arrangement is disclosed by *Van Vliet*, and further would be an obvious design choice for a POSITA to implement in the systems of *Van Vliet* and *Cable* as the intent of both references is to deliver hydrocarbons from tanks and pumps to hoses on reels, and one known method was to use reels which are fluidly connected to the hoses mounted thereon.

155. Initially, FIG. 1 of *Van Vliet* shows that the reels 30 are fluidly connected to the hoses and manifolds.[188]

[187] EX1001, 4:14-16.

[188] EX1004 FIG. 1 (annotated).

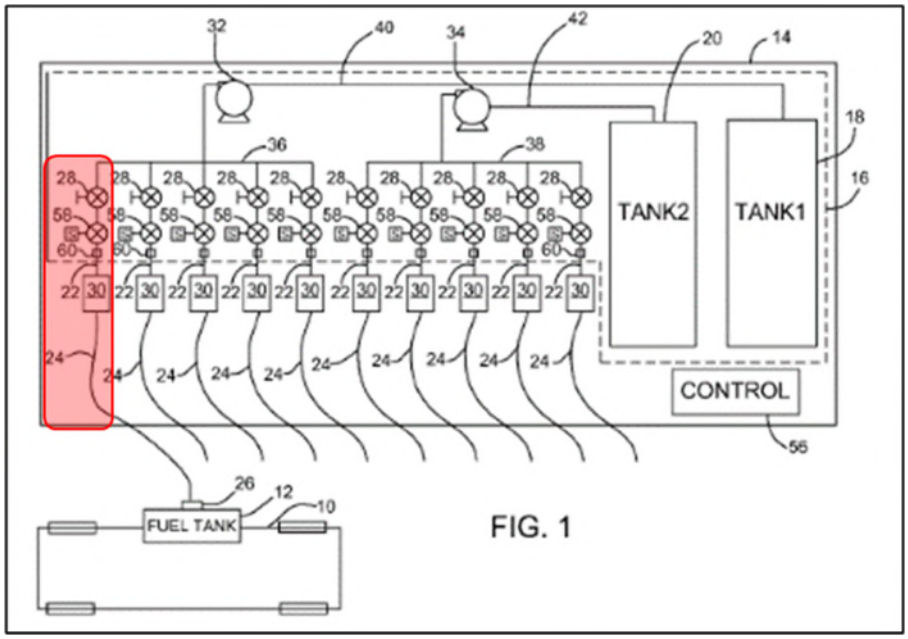
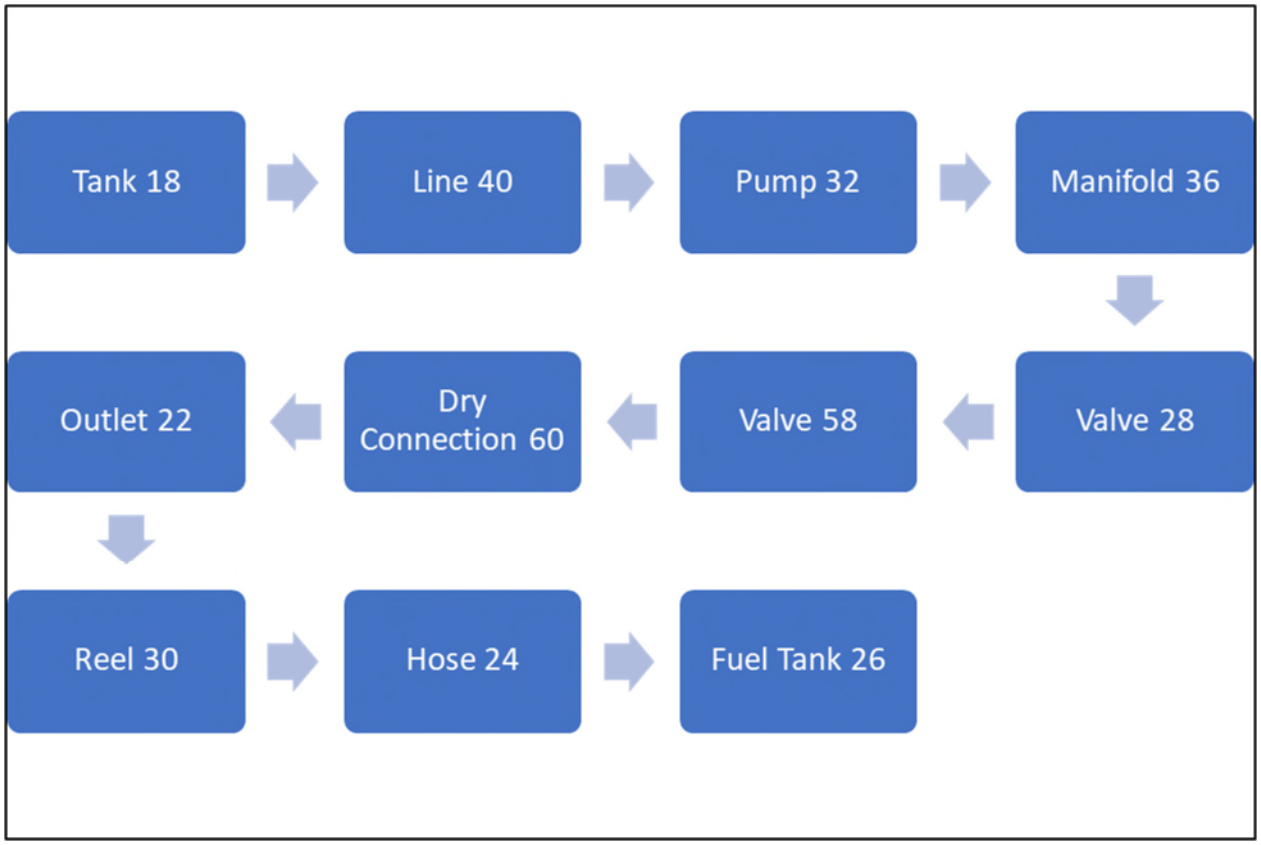



FIG. 1

156. In the annotated FIG. 1 above, a single fluid stream is annotated in red. In this fluid stream, reel **30** is shown in series with the stream, in between outlet **22** and hose **24**. A POSITA would have understood, based on this diagram, that fluid flow is as follows:

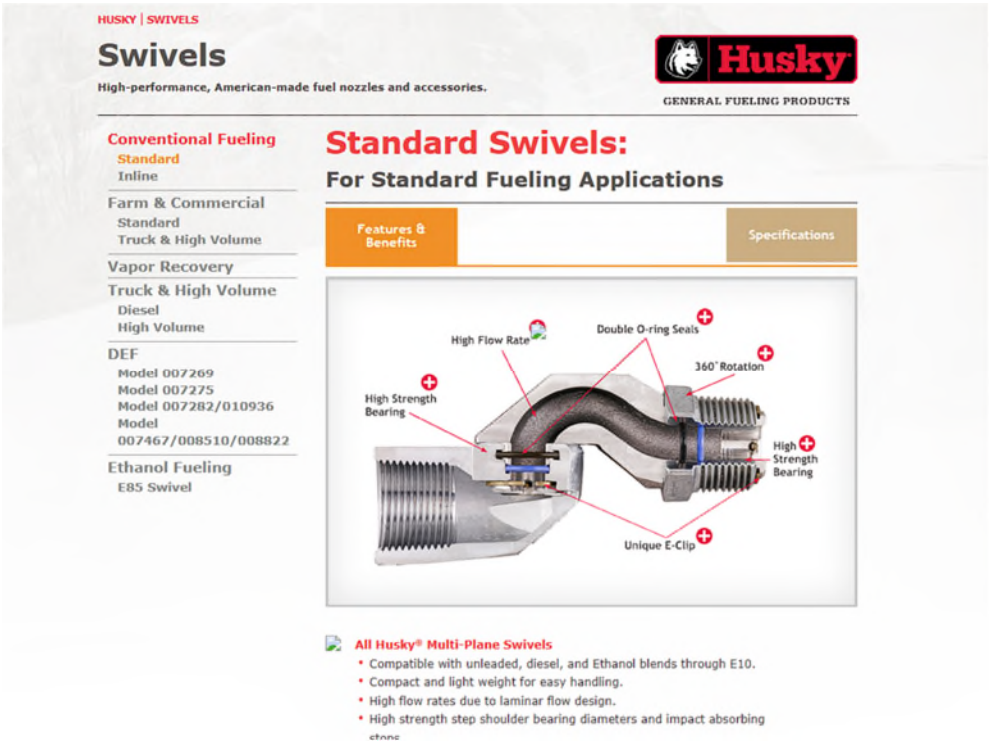



157. Accordingly, a POSITA would have understood that the reel 30 is part of the fluid stream, and is, therefore, fluidly connected to both the manifold and the hose. The same is true for each of the streams identified in FIG. 1 (though the pump, line, tank and manifold numbers may change).

158. *Cable* also teaches fluidly connecting the hoses to the manifold with or through the reels. Fluids in tank 27 of *Cable* flow out of "pump outlet tube 46" to one or more of the hoses (*e.g.*, hoses 64 and 65) that are stored on reels (*e.g.*, reels 62 and 63).[189] *Cable* discloses that "[t]ube 46 is connected by a conventional reel

[189] EX1005, 4:22-33.

rotatable coupling to hose 65." *Id.*, 4:33-36 & FIG. 5. A POSITA would have understood that a conventional reel rotatable coupling (i.e. swivel joint) would be connected to a flow path in the reel that allows fluid to flow through the reels into the hose.[190] For example, as discussed in Section VIII.D, a swivel joint is shown as the inlet port of the reels discussed in *Coxreels*. As another example, the Husky website teaches that swivel joints would have been known to a POSITA before the '805 Patent claims.[191]




[190] *See supra* Section VIII.D

[191] EX1028.

159. Further, the entire purpose of the systems of *Van Vliet* and *Cable* is to deliver fluid through the hoses to the delivery point (*i.e.*, external vehicle or equipment). Delivery of fluid through the hoses would require that the hoses be fluidly connected to the pumps and the manifolds. Further, based on the knowledge of a POSITA of what was available on the market at the time of the '805 Patent application, the reel is also fluidly connected to the manifold and the hoses.[192] For example, a reel typically used in the industry in this type of application at the time of the '805 Patent was the reel supplied by Coxreels described in the *Coxreels* reference. *Coxreels* describes an "[e]xternal fluid path with machined from solid brass 90° full-flow NPT swivel inlet":[193]

[192] *See supra* Sections VIII.B and VIII.D.

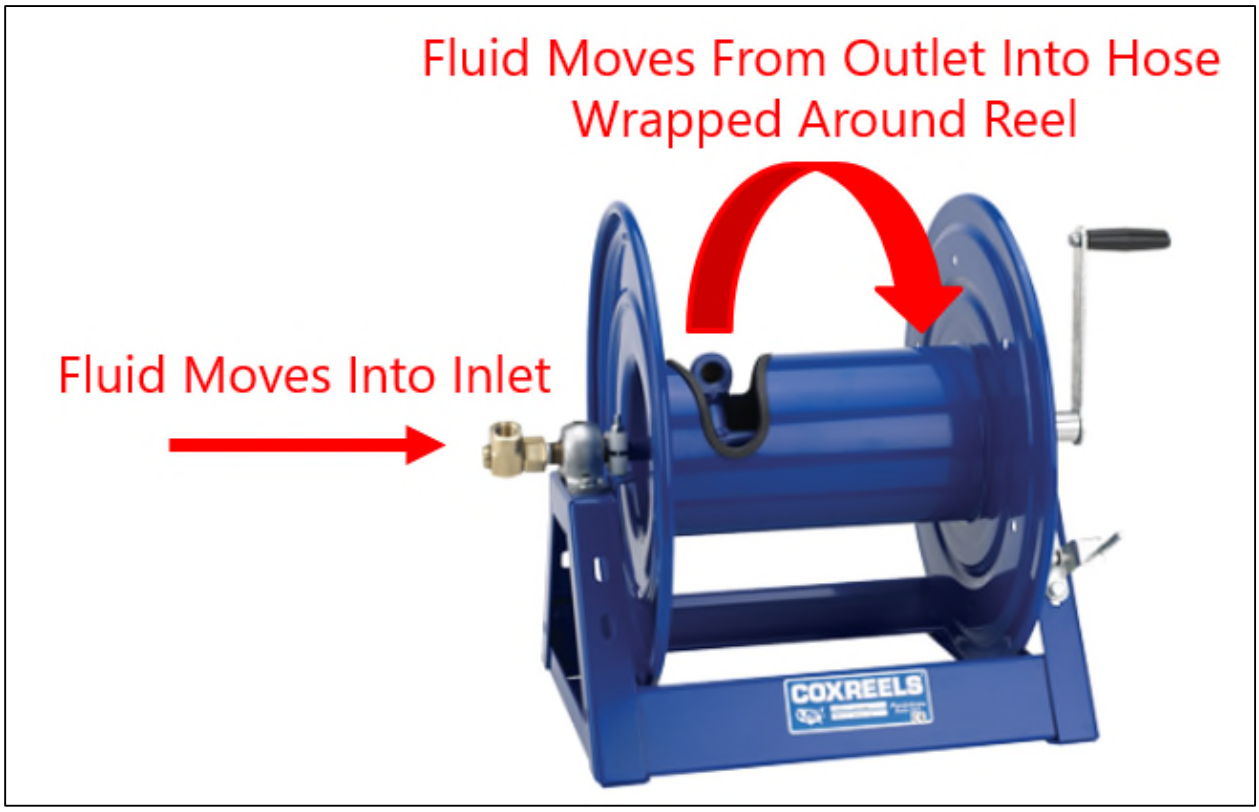
[193] EX1008 (excerpted and annotated to show "external fluid path" with brass "swivel inlet.").


*Coxreels* also describes a "low profile outlet riser & open drum slot design for flat smooth hose wrap.":[194]

[194] EX1008 (excerpted and annotated to show "outlet" and "drum slot.").


160. Accordingly, a POSITA would have recognized that fluid in a system using *Coxreels* would be fluidly connected to the "external fluid path" via the brass inlet, pass through the reel body, and exit into a hose from the outlet made accessible by the "low profile outlet riser & open drum slot design." This was a common and well-known arrangement of hoses and reels at the time of the '805 Patent.[195]

[195] EX1008 (below) (excerpted and annotated to show path of fluid).




Thus, a POSITA would recognize as obvious fluidly connecting a manifold (upstream of the reel body) to hoses (downstream of the reel body) through the reel body.

161. *Van Vliet* further discloses that "a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold":[196]

[196] EX1004, FIG. 1 (annotated).

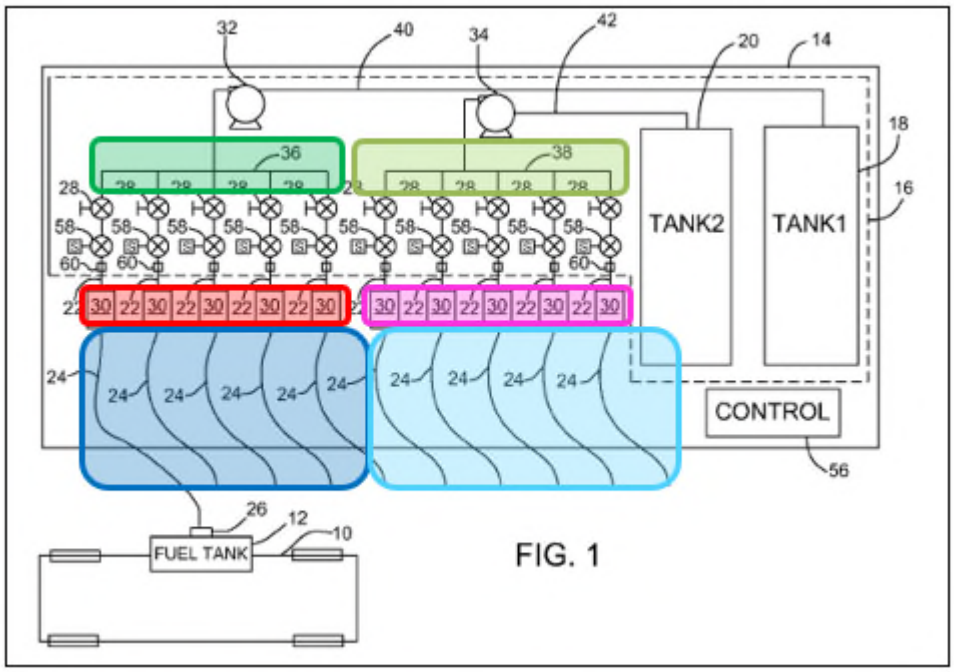



FIG. 1

162. As depicted above, left hoses **24** (dark blue) and right hoses **24** (light blue) are connected to reels **30** (red). A portion of the reels **30** (red) on the left are connected to manifold **36** (green), and the second portion of the reels **30** (purple) on the right connect to manifold **38** (light green). Accordingly, a POSITA would have understood that *Van Vliet* discloses "a plurality of hoses connected, respectively, with the reels, wherein a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold." Accordingly, *Van Vliet* and *Cable*, either individually or in combination with the knowledge of a POSITA, disclose Claim 1[e] , and the combination of *Van Vliet* and *Cable* renders the claim limitation obvious.

**g. <u>Claim 1[f]: "a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses"</u>**

163. *Van Vliet* discloses "a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses." Figure 1 of *Van Vliet* shows such an arrangement.[197]

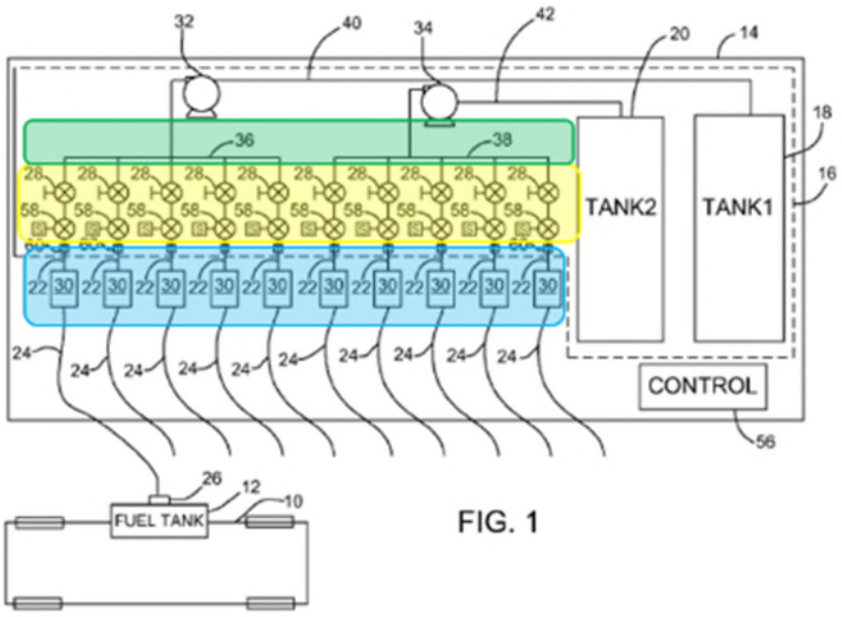



FIG. 1

164. As depicted above, *Van Vliet* discloses a plurality of valves **28** and **58** (yellow).[198] The fuel delivery system (including valves **28** and **58** in yellow) is on a mobile trailer.[199] Each of the valves **28** and **58** (yellow) is illustrated downstream of

[197] EX1004, FIG. 1 (below) (annotated to show hoses 24 highlighted in blue, valves 28 and 58 highlighted in yellow, and manifolds 36, 38 highlighted in green).

[198] EX1004, FIG. 1.

[199] EX1004, [0008], [0014], *see also supra.* Section XI.A.2.b.

one of manifold **36** and manifold **38** (green).[200] Furthermore, each of the valves **28** and **58** (yellow) is situated upstream of a respective different one of the hoses **24** (blue).[201] *Van Vliet* provides a description of the arrangement shown in FIG. 1: "Each tank **18**, **20** is connected to respective pumps **32**, **34** and then to respective manifolds **36**, **38** via lines **40**, **42**. The fuel outlets **22** are located on the manifolds **36**, **38** and fluid flow through the fuel outlets **22** is controlled preferably at least by the manual valves **28**."[202] Further, *Van Vliet* discloses "[a] valve arrangement, comprising for example valve **28** and/or valve **58**, is provided at each fuel outlet **22** to control fluid flow through the hose **24** connected to each respective fuel outlet **22** to permit independent operation of each hose **24**."[203] Accordingly, a POSITA would have understood that *Van Vliet* discloses "a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses" as claimed in Claim 1[f], and the combination of *Van Vliet* and *Cable* renders the claim limitation obvious.

[200] EX1004, FIG. 1.

[201] EX1004, FIG. 1.

[202] EX1004, [0016].

[203] EX1004, [0015].

**h. Claim 1[g]: "a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses"**

165. *Van Vliet* discloses "a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses." In *Van Vliet*, each hose leads to a fuel tank on a separate piece of equipment, as shown in FIG. 1:[204]

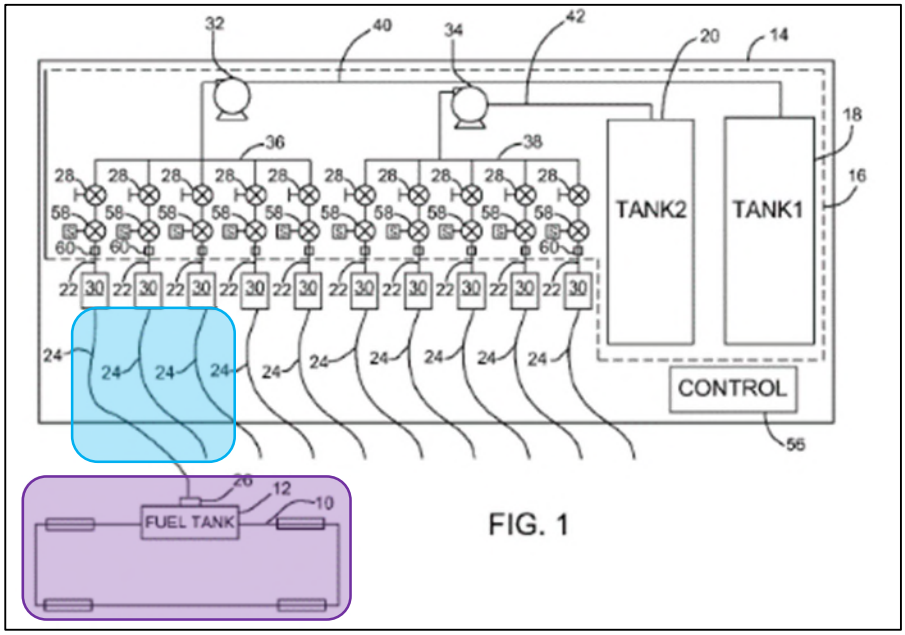
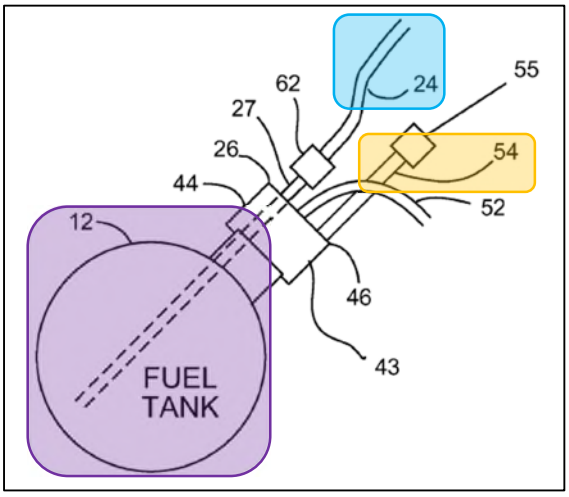


FIG. 1

[204] EX1004, FIG. 1 (annotated to show hoses 24 highlighted in blue and fuel tank 12 highlighted in purple).

166. According to *Van Vliet*, each fuel tank **12** has a fuel cap **26** secured thereon that is connected to both one of the hoses **24** and a fuel level sensor **54**, as shown in FIG. 2 below:[205]




167. *Van Vliet* further describes the sensors: "The fuel level sensor 54 may be any suitable sensor such as float sensor, vibrating level switch, or pressure transducer."[206] A POSITA would have understood that the float sensor and the vibrating level switch would each be used to obtain information about the level of fuel in the fuel tank and would accordingly be "fluid level sensors" as the term is used in the claim. The specification of the '805 Patent, when discussing an

[205] EX1004, FIG. 2 (annotated to show hose 24 highlighted in blue, fuel level sensor 54 highlighted in orange, and fuel tank 12 highlighted in purple).

[206] EX1004, [0017].

embodiment of the claims, states "The sensor **50***d* may be any type of sensor that is capable of detecting fluid or fuel level in a tank."[207]

168. Each of *Van Vliet's* hoses is associated with a respective fuel level sensor **52**, as claimed in 1[g]. Accordingly, *Van Vliet* discloses the limitations claimed in Claim element 1[g] and the combination of *Van Vliet* and *Cable* renders the claim limitation obvious.

**i. Claim 1[h]: "wherein the reels are arranged on first and second opposed sides in the mobile trailer, with an aisle walkway down the middle of the mobile trailer"**

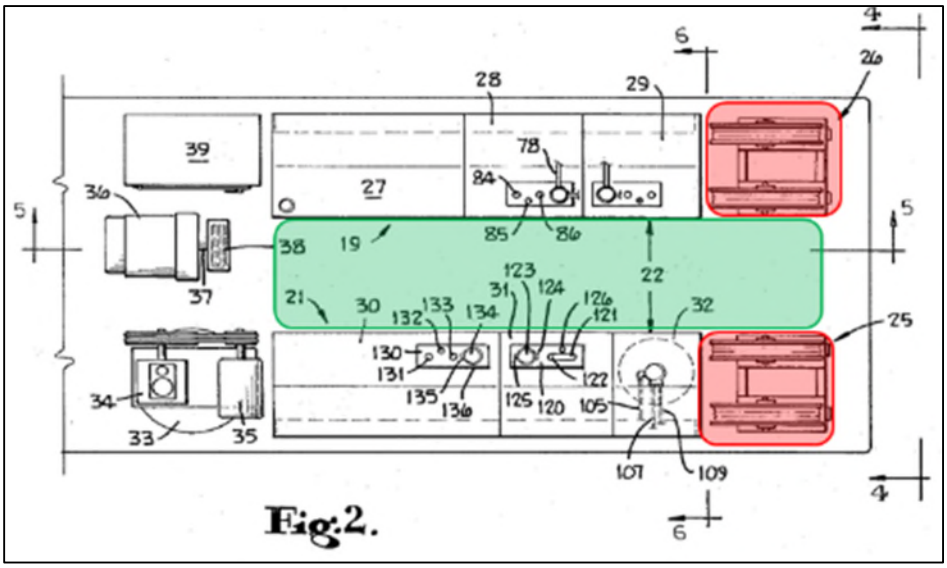
169. *Cable* discloses "wherein the reels are arranged on first and second opposed sides in the mobile trailer, with an aisle walkway down the middle of the mobile trailer." As depicted in FIG. 2 below, the hose assemblies **25** and **26** that include reels (red) are located on opposed sides of the interior of the van truck.[208] Furthermore, an aisle walkway (green) is depicted between tank bays **19** and **21** along the length of the van truck and extending to the rear end of the van truck between the reels.[209] [210]

[207] Ex 1001 8:35-36

[208] EX1005, FIG. 2.

[209] EX1005, FIG. 2.

[210] EX1005, 2:55-63, FIG. 2 (annotated to show reels highlighted in red and aisle/walkway in green).




170. It would have been obvious to a POSITA to use the arrangement disclosed in *Cable* in the trailer of *Van Vliet*. *Van Vliet* contemplates various arrangements of its on-trailer equipment, stating that "[t]he spatial orientation of the control station **56**, reels **30**, manifolds **36**, **38**, tanks **18**, **20**, and other equipment such as the generators is a matter of design choice for the manufacturer and will depend on space requirements."[211] Accordingly, when determining the arrangement of on-trailer equipment, a POSITA would have looked at other, similar references to provide details of specific arrangements. As discussed in Section XI.A.1, *Cable* provides such details. Thus, it would have been obvious to a POSITA to use *Cable*'s reel-and-aisle arrangement as a "matter of design choice" in the trailer of *Van Vliet*. A POSITA would have implemented the spatial arrangement of Cable to the trailer

[211] EX1004, [0027].

of *Van Vliet* to take advantage of the benefits of such an arrangement, including to allow *Van Vliet*'s system to be more easily traversable by operators for the purpose of repairs, maintenance, and/or physical inspection.

171. Further, a POSITA would have implemented the arrangement of *Cable* to *Van Vliet* to help meet *Van* Vliet's goal of "[t]he manual valves **28** should be readily accessible to an operator on the trailer **14**. This can be arranged with the manifolds **36**, **38** mounted on a wall of the trailer with the outlets **22** extending inward of the trailer wall."[212] The arrangement of *Cable*, with reels on opposed sides of the trailer and a walkway therebetween would provide a convenient method to meet *Van Vliet*'s goal.

172. Finally, a POSITA would have implemented *Cable's* arrangement of reels and aisles in order to make it easier for the system to meet *Van Vliet's goal* that equipment on one side of the well (such as the passenger's side of the vehicle) are fed from reels on the same side of the vehicle, while equipment on the other side of the well are fed from reels on the opposed side of the vehicle, as discussed above in Section XI.A.1.[213] The spatial orientation of *Cable* would allow separate manifolds to serve separate pieces of equipment on opposed sides of the well with minimal

[212] EX1004, [0026].

[213] EX1004, [0024].

crossing of hoses, for example, if the trailer is backed or pulled directly towards or opposite the wellhead and hoses are fed from each side of the trailer.

173. A POSITA would have had no trouble implementing Cable's arrangement to the trailer of *Van* Vliet, as it is simply a predictable variation of the spatial orientation taught by *Cable*, using the known equipment and techniques of *Van Vliet*. Accordingly, the combination of *Van Vliet* and *Cable* discloses or at least suggests the arrangement of reels and aisle claimed in 1[h], and the combination renders the claim obvious.

### 3. Claim 2: "The distribution station as recited in claim 1, wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels"

174. *Cable* discloses "wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels." Both FIG.1 and FIG. 4 of Cable show just such an arrangement.[214]

[214] EX1005, FIG. 1. (annotated to show lower row of reels highlighted in red and upper row of reels highlighted in pink); *Id.*, FIG. 4 (annotated to show lower row of reels highlighted in red and upper row of reels highlighted in pink).

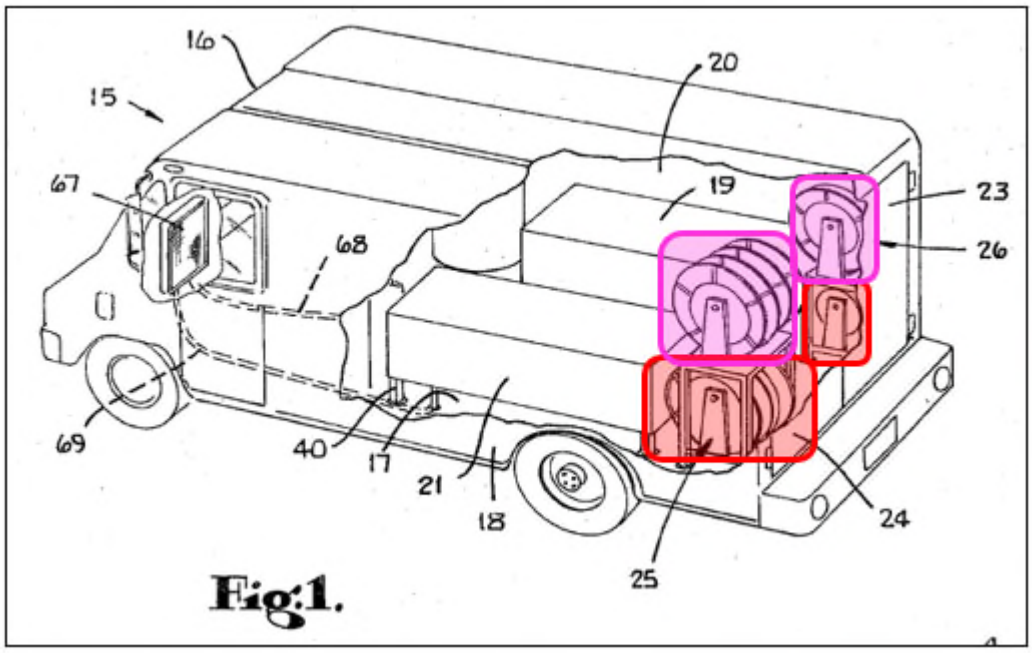



Fig.1.

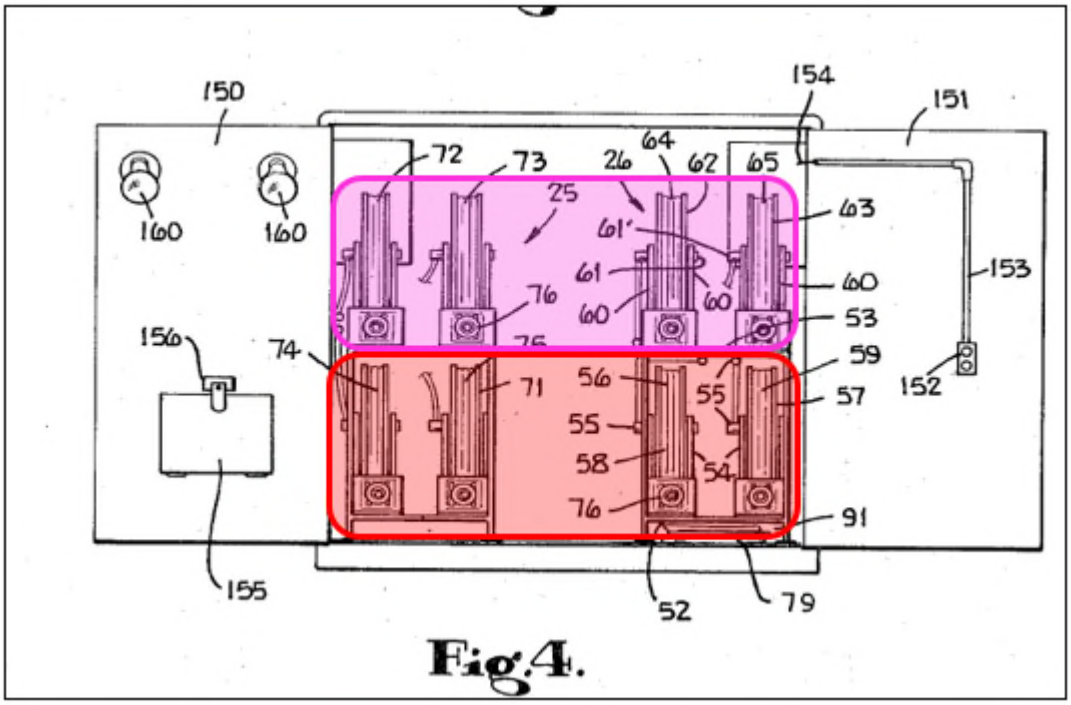



Fig.4.

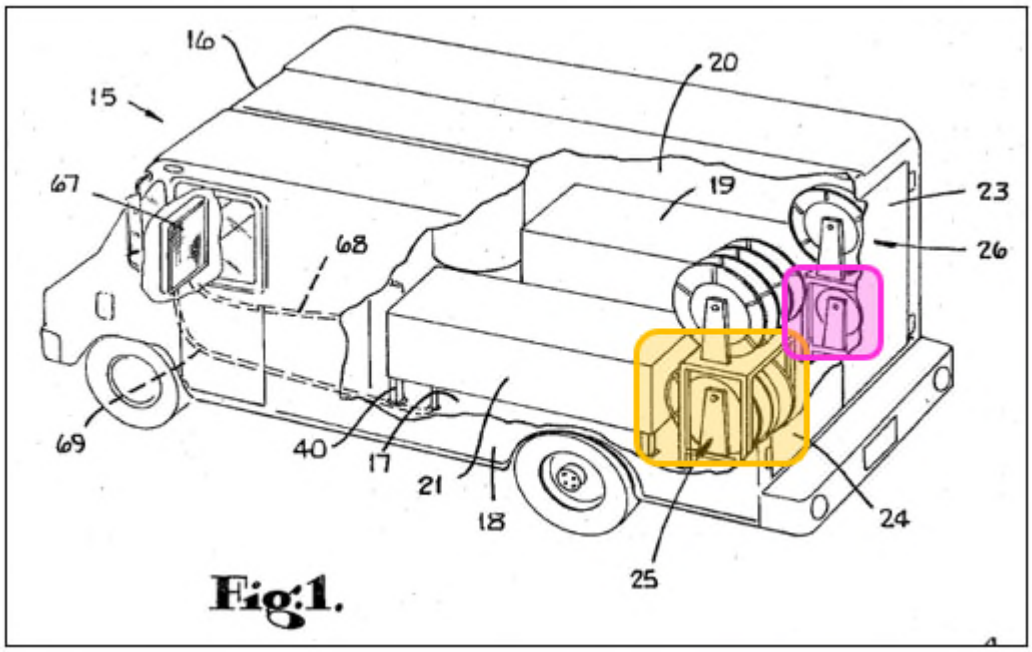
175. As depicted above, *Cable*'s mobile trailer includes two reels on the first side arranged in an upper row; two reels on the first side arranged in a lower row; two reels on the second side arranged in an upper row; and two reels on the second

side arranged in a lower row. Further, *Cable* provides a description of the arrangement: "Each of the hose assemblies has a pair of upper reels and a pair of lower reels rotatably mounted to the frame of a wheel assembly."[215] A POSITA would have implemented the arrangement of hoses and reels disclosed in *Cable* to the trailer of *Van Vliet* to take advantage, for example, of the space savings of such an arrangement. Accordingly, *Cable* discloses "wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels" and arranging the reels into an upper and lower configuration allows for twice as many reels to be disposed along the length of the trailer. Further, such an arrangement would have made it easier for the operator to access the valves and reels, as they would be arranged efficiently. Accordingly, the combination of *Cable* and *Van Vliet* renders Claim 2 obvious.

[215] EX1005 2:67-3:3; *see also id.*, 4:1-5, 3:43-56.

**4. Claim 3: "The distribution station as recited in claim 2, further comprising first and second support racks on which the reels are supported, the first support rack arranged on the first side and the second support rack arranged on the second side"**

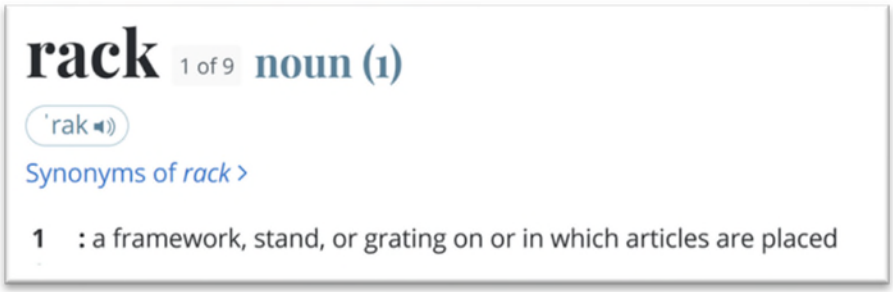
176. *Cable* discloses "first and second support racks on which the reels are supported, the first support rack arranged on the first side and the second support rack arranged on the second side." FIG. 1 of *Cable* shows such an arrangement.[216]




177. *Cable* further describes the support racks, referring them as a platform supported by posts. "Hose assembly **26** (FIG. 5) has a frame **50** with vertically up-standing posts **51** fixedly mounted atop platform **17**. Crossbars **52** extend across each

[216] EX1005, FIG. 1 (annotated to show first support rack highlighted in orange and second support rack highlighted in pink); *see also id.*, 3:1-3 (describing reels "rotatably mounted to the frame of a wheel assembly").

side of the hose assembly being secured to posts **51** by welding or other suitable means. Bars **52** are spaced above platform **17** approximately a distance of one foot allowing for the storage of suction hose **79**. A platform **53** is mounted atop the upper ends of posts **51** allowing the upper two reels to be mounted thereon." [217] A POSITA would have recognized the platform and posts as described in *Cable* to be a "rack" as claimed in Claim 3. For example, the Merriam Webster dictionary defines rack as a "framework, stand, or grating on or in which articles are placed."[218] A POSITA would have recognized the frame, posts, platforms, bars and crossbars described in *Cable* to meet this definition.




178. To the extent that Patent Owner argues that *Cable* does not explicitly state the wheel assembly frames (platforms and posts) to be "support rack[s]," a POSITA would have understood that support racks would be an obvious design choice, and at least obvious to try. As discussed above, *Cable* discloses reels

[217] EX1005 3:44-53.

[218] EX1029.

arranged in an upper and lower orientation. To have reels arranged in an upper/lower configuration, it would be necessary to have a "rack" or some other support arrangement to hold the reels in the desired spatial orientation. Furthermore, it would have been obvious to a POSITA to combine the stacked reel arrangement of *Cable* with the trailer of *Van Vliet*, as discussed above. Further, to implement the stacked arrangement, it would have been obvious to use whatever support structure is necessary to achieve stacked rows of reels, including "racks."

179. Accordingly, for at least the reasons discussed above, "[t]he distribution station as recited in claim 2, further comprising first and second support racks on which the reels are supported, the first support rack arranged on the first side and the second support rack arranged on the second side" as claimed in Claim 3 is disclosed by *Cable* and is rendered obvious by the combination of *Van Vliet* and *Cable*.

**5. Claim 4: "The distribution station as recited in claim 3, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3"**

180. *Cable* renders obvious "wherein the aisle walkway has an aisle width, and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3." A POSITA would have understood that this would be an obvious design choice. *Van Vliet* notes that the spatial orientation of the reels **30**,

manifolds **36** and **38**, tanks **18** and **20**, and other equipment shown "is a matter of design choice for the manufacturer and will depend on space requirements."[219] In making these design choices for a system like that disclosed in *Cable* or *Van Vliet* (each of which required a human operator) a POSITA would have needed to comply with "space requirements," for example, under relevant occupational safety standards. The Occupational Health and Safety Administration (OSHA) promulgates safety regulations applicable to the workplace. As OSHA does not promulgate specific standards for the Oil and Gas industry, OSHA's "General Industry and Health Standards" are most applicable. One of these standards dictates the minimum width of "exit routes" in the workplace. For example, because a human operates the manual shut-off valves from *Van Vliet* (valve **28**) there must be an exit path for the operator to evacuate such as in an emergency. [220]OSHA Occupational Safety and Health Standards ("OSHS") require an exit path that is at least 28 inches wide at all points. This would be the minimum width of the "aisle" or the *Van Vliet/Cable* combination. As one example of typical hose reels, the reels described

[219] EX1004, [0027].

[220] *See* EX1031, OSHS 1910.36(g)(2) ("An exit access must be at least 28 inches (71.1 cm) wide at all points. Where there is only one exit access leading to an exit or exit discharge, the width of the exit and exit discharge must be at least equal to the width of the exit access.").

in *Coxreels* have a 17 and 5/8" diameter.[221] Accordingly, the *Van Vliet* system using a typically available reel diameter (17 5/8") and a minimum regulatory aisle width (28") would have a ratio between the walkway and the reel diameter of 1.588, which falls within the range recited in Claim 4 (at least 1.3).

$$\frac{28"}{17.625"} = 1.588$$

181. In view of the above, it would have been an obvious matter of design choice for a POSITA (*e.g.*, to comply with relevant safety standards) to design the distribution station of *Van Vliet*, as modified by *Cable*, so that the aisle width is greater than the reel diameter by a factor of at least 1.3, based on the regulatory requirements and commercially available reel sizes.

182. Further, it would have been obvious to a POSITA to provide an aisle width at least 1.3 times as wide as the reel diameter to facilitate maintenance of the system. As would have been known to a POSITA, leaks can develop on the hoses, and in or associated with the fittings on the reel. A leak on the reel fittings would require removal and replacement of the reel. Based on the disclosure of *Van Vliet* that "[t]he manual valves **28** should be readily accessible to an operator on the trailer

[221] S*ee* EX1008.

**14**. This can be arranged with the manifolds **36**, **38** mounted on a wall of the trailer with the outlets **22** extending inward of the trailer wall"[222], more likely than not this removal would be conducted on the interior of the *Van Vliet/Cable* combination, as opposed to from the exterior, and would necessitate handling and carrying the reel in and down the aisle. A space 30% larger than the diameter of the reel would allow manipulation of the reels during repair/replacement without undue experimentation. Accordingly, such an arrangement would have been at least obvious to try, to facilitate repair/replacement of the reels.

183. Accordingly, the combination of *Van Vliet* and *Cable*, in view of a POSITA's knowledge of commercially available reels and safety regulations (including OSHA regulations), at least renders obvious the ratio of aisle and walkway claimed in Claim 4.

**6. Claim 5: "wherein the trailer has a trailer width of no greater than about 96 inches"**

184. *Van Vliet* and *Cable* discloses or render obvious "wherein the trailer has a trailer width of no greater than about 96 inches." *Van Vliet* discloses that its trailer may be a commercially-available trailer, *e.g.*, made by Sea-Can Containers of Edmonton, Canada.[223] Sea-Can Containers' website from around the relevant time

[222] EX1004, [0026].

[223] EX1004, [0024].

describes that their 20-foot intermodal containers (which would be mounted on trailers) could be configured "with doors in each end and a center dividing wall to form two 8ft x 10ft cubicles".[224] This indicates that that such containers were 8 feet (or 96 inches) wide. Moreover, at the time the '805 Patent was filed, a POSITA would have recognized that many oil and gas drilling and fracturing sites were located on State or County maintained roads. Further, a POSITA would have been motivated to follow regulations regarding the maximum width of vehicles, including trailers and loads, on such roads. As Discussed in Section VIII.C., many states have a maximum width of trailer and/or loads of 96" on roads which are not part of the Interstate or National Network (NN) highway system. A POSITA would have been motivated to design and construct the trailer of the *Van Vliet/Cable* combination so that it would have universal access to oil and gas fracturing sites, including those on State and County roads where many drilling and fracturing locations are located. Therefore, it would have been obvious to a POSITA to design a trailer of *Van Vliet* or *Cable* to have a trailer width of no greater than the legal limit for use on those State and County maintained roads (that is, 96 inches).[225] Accordingly, the

[224] http://web.archive.org/web/20050120224856/http://sea-can.com/products_cargocontainers_uses.shtml

[225] *See* EX1009, 1, see also Section VIII.C and state regulations referenced therein.

combination of *Cable* and *Van Vliet* in view of the knowledge of a POSITA regarding safety regulations render Claim 5 obvious.

**7. Claim 6: "The distribution station as recited in claim 2, wherein a ratio of a number of reels in the upper row to a number of reels in the lower row is 1:1"**

185. *Cable* discloses "wherein a ratio of a number of reels in the upper row to a number of reels in the lower row is 1:1." FIG. 4 of *Cable* shows such an arrangement.[226]

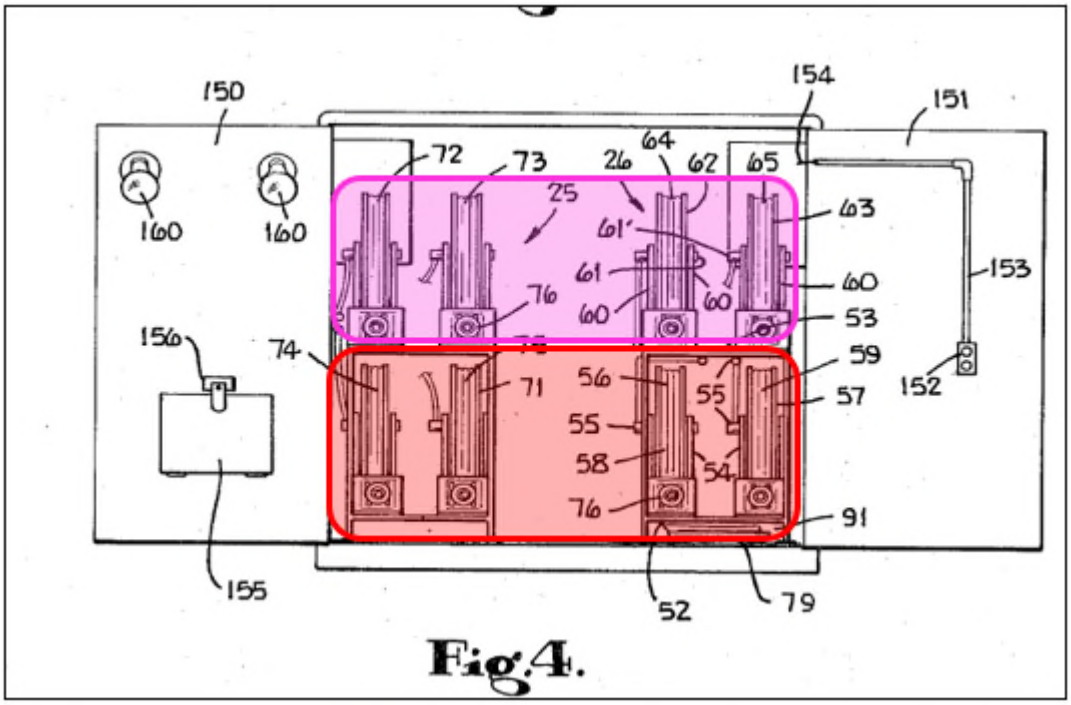


Fig.4.

186. As depicted above, the upper and lower rows of reels in *Cable* each have four reels, which provides a ratio of 1: 1 (that is one upper reel for each lower

[226] EX1005, FIG. 4 (annotated to show lower row of reels highlighted in red and upper row of reels highlighted in pink).

reel and *vice versa*).[227] Accordingly, *Cable* discloses "wherein a ratio of a number of reels in the upper row to a number of reels in the lower row is 1:1." The limitations of Claim 7 are disclosed by *Cable* and the claim is rendered obvious by the combination of *Van Vliet* and *Cable.*

**8. Claim 7: "The distribution station as recited in claim 1, wherein the mobile trailer includes trailer end wall that has an outside door, an inside wall that defines first and second compartments in the mobile trailer, the outside door opening into the first compartment, and at least the manifolds and the reels are in the first compartment."**

187. *Van Vliet* and *Cable* disclose, either alone or in combination, that "the mobile trailer includes trailer end wall that has an outside door, an inside wall that defines first and second compartments in the mobile trailer, the outside door opening into the first compartment, and at least the manifolds and the reels are in the first compartment."

188. As discussed above, *Van Vliet* discloses manifolds **36** and **38** and reels **30** in the body of a trailer (first compartment).[228] *Van Vliet* also discloses a cabin (second compartment) that may comprise various control equipment and other items used by an operator, and may have a window with a line of sight to the frac equipment as well as a dashboard containing readouts of system characteristics: "[a]

[227] EX1005, FIG. 4., see also FIG. 1

[228] EX1004, [0003].

cabin (not shown) may be added to the system, for example comprising a heater, desk, and access to relevant control equipment. The cabin may have a window with a line-of-sight to the frac equipment. A dashboard may be visible from the cabin, the dashboard containing readouts of system characteristics such as fuel tank **12** levels."[229] A POSITA would have understood that this cabin would be separate from the first compartment where the reels and manifolds are located, and that the cabin would be separated from the other compartment by at least an inside wall, in order to protect the occupant and any electrical/electronic equipment (such as the heater and relevant control equipment). For example, industry standards such as NEC, IFC, API 500 and NFPA 497 require that ignition sources (such as a heater or other electrical/electronic equipment not listed for use in a classified environment) be separated from sources of flammable or combustible liquids (such as the valves, etc. containing fuel). One way to provide such separation is using a wall. A POSITA would have understood, based on various codes and standards, that the area where pumps, fuel containers, valves, fittings, and hoses contain fuel (*i.e.*, rear compartment of *Cable* or main compartment of *Van Vliet*) would be classified as a Class I area, either Div. 1 or Div. 2 depending on the fuel handled and distance from the fitting. As described in Section VIII.G, this classified area extends as much as

[229] EX1004, [0032].

25 feet from its origin. A wall with a closed door and seal (*i.e.*, non-pierced wall) would reduce the area classification of the cabin from Class I Div. 2 to unclassified, allowing the use of items such as a heater and electrical equipment not listed for hazardous areas in the cabin. [230] A POSITA would recognize the benefits, including ease of access, ease of installation and cost, to using non-classified listed equipment where possible. Accordingly, a POSITA would have understood, based on the disclosure in *Van Vliet*, that a wall would be required between the classified areas in the main compartment and the heater in the separate cabin.

189. Further, *Cable* discloses such an arrangement. *Cable* teaches "a conventional van truck **16** having a driver compartment as well as a rear compartment wherein two bays of tanks **19** and **21** are mounted within the van atop rear platform **17**." The driver compartment and rear compartment are separate "compartments." A POSITA would have no trouble understanding the use of a wall to separate the compartments from each other. Further, a POSITA would be motivated to use such a wall to protect the driver and electric/electronic equipment from potential spills or releases of flammable/combustible liquids or vapors to meet industry standards such as the NEC, IFC, NFPA 497 and API 500.

[230] *See supra* Section VIII.F.

190. *Cable* further discloses a wall at the rear end of the van truck that includes doors **150** and **151** that open from outside the van truck:[231]

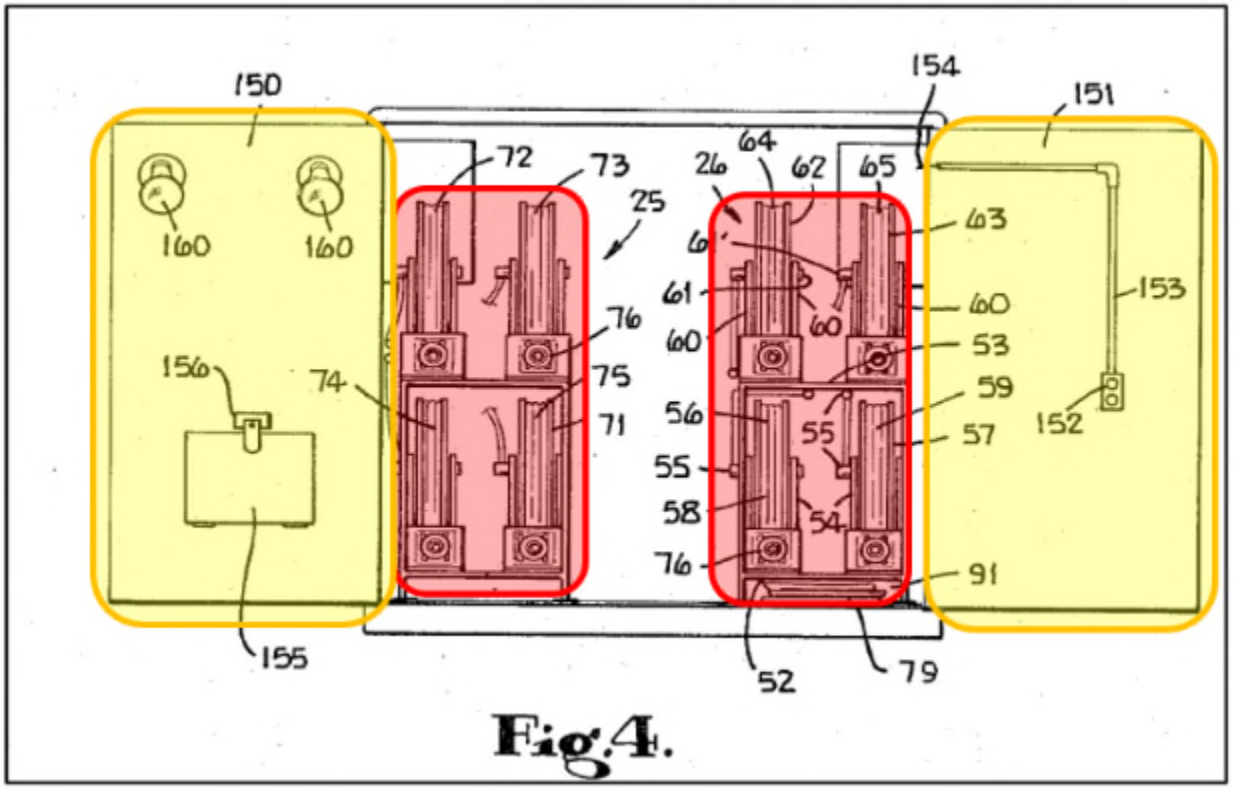


Fig.4.

191. Furthermore, *Cable* includes an inside wall that defines first and second compartments in its van truck.[232] The van truck of *Cable* has a rear (first) compartment that contains the tank bays **19** and **21** and the hose assemblies that include reels (red), and a driver (second) compartment.[233] A POSITA would have

[231] EX1004, [0032]; EX1005, FIG. 4 (annotated to show reels highlighted in red and outside doors highlighted in yellow).

[232] EX1005, 2:48-54; *see also* EX1005, FIG. 1.

[233] EX1005, 2:48-54 and FIG. 1.

understood that the driver compartment would be separate from the rear compartment where the tank bays and hose assemblies are located, and that the driver compartment would be separated from the rear compartment by an inside wall. A POSITA would have understood the separation in *Cable* to be a wall in order to separate the passenger compartment from flammable / combustible liquids as described in the various industry standards described in Section VIII.G. The outside doors **150** and **151** in the rear wall open into the rear end of the rear compartment.

192. To the extent *Van Vliet* lacks one or more elements of Claim 7, it would have been obvious to a POSITA at the time of the '805 Patent to use the layout for the first and second compartments, inside wall, and outside door as disclosed in *Cable* in *Van Vliet*'s mobile trailer. *Van Vliet* and *Cable* disclose very similar types of vehicles used for similar purposes, and *Van Vliet* teaches that the spatial orientation of the reels, manifolds, tanks, and other equipment is a matter of design choice. *Van Vliet* notes that the spatial orientation of the reels **30**, manifolds **36** and **38**, tanks **18** and **20**, and other equipment shown "is a matter of design choice for the manufacturer and will depend on space requirements," for which a POSITA would look to other references like *Cable*.[234] Accordingly, *Cable* discloses, with the

[234] EX1004, [0024].

knowledge of a POSITA regarding industry codes and standards, and in combination with *Van Vliet* renders obvious Claim 7.

**9. Claim 8: "The distribution station as recited in claim 7, wherein the inside wall includes an inside door providing access between the first compartment and the second compartment, the aisle walkway extending from the outside door to the inside door"**

193. *Van Vliet* in view of *Cable* renders obvious "wherein the inside wall includes an inside door providing access between the first compartment and the second compartment, the aisle walkway extending from the outside door to the inside door." As discussed above regarding Claims 1 and 7, *Van Vliet* and *Cable* disclose or render obvious the aisle walkway and the inside wall.[235]

194. *Cable* further discloses or renders obvious an inside door between the compartments. *Cable* states that "a person [can] walk between the tanks [in the rear compartment] from the driver compartment toward the back doors"—thus, *Cable* describes a system where it is possible to travel from the driver compartment to the rear compartment.[236] A POSITA would have understood that the only way (or, at minimum, the most natural design choice) to enable travel between two compartments separated by an inside wall would be to provide an inside door in the

[235] *See supra.* Section XI.A.2 and XI.A.8.

[236] EX1005, 2:48-54.

inside wall.[237] Further, based on industry codes and regulations dealing with classified areas, a door (with a seal) would be necessary in order to isolate the driver's compartment and the electrical and electronic equipment therein from the fuels and vapors in the first compartment. Accordingly, *Cable* discloses, and in combination with *Van Vliet* and the knowledge of a POSITA regarding safety codes and standards renders obvious Claim 8.

**10. Claim 9: "The distribution station as recited in claim 7, a controller in the second compartment, the controller configured to operate the valves."**

195. *Van Vliet* discloses that the distribution station "further comprising a controller in the second compartment, the controller configured to operate the valves." *Van Vliet* discloses a control station 56 that monitors fuel levels and controls valves based on those fuel levels. For example, *Van Vliet* discloses "The control station or controller **56** is responsive to signals supplied from each fuel level sensor **54** [] to provide control signals to the respective automatically operable valves **58**"[238] *Van Vliet* further discloses "Having a manual override may be important to a customer. Manual override may be provided by using valves **28**, and may also be provided on an electrically operated valve **58**."[239] A POSITA would have

[237] EX1005, 2:48-54.

[238] EX1004, [0020].

[239] EX1004, [0020].

understood, based on the teaching of *Van Vliet* that "controller **56**" includes a "control station" to allow for, at least "manual override" of the electrically (automatically) operated valve **58**.

196. *Van Vliet* also discloses that "[a] cabin may be added to the system, for example comprising a heater, desk, and access to relevant control equipment. [] A dashboard may be visible from the cabin, the dashboard containing readouts of system characteristic such as fuel tank **12** levels."[240] A POSITA would have easily recognized that access to relevant control equipment would include access to "control station **56**" including for, at least, manual override of the electrically (automatically) operated valve **58**. Accordingly, *Van Vliet* discloses a control station configured to operate valves, and that the control station may be provided in comprise a cabin/second compartment. *Van Vliet*, accordingly, discloses the claim limitation of Claim 9, and the combination of *Van Vliet* and *Cable* renders the claim obvious.

**11. Claim 10: "The distribution station as recited in claim 9, wherein the second compartment is insulated with a fire resistant or retardant material"**

197. A POSITA would have understood that the cabin of *Van Vliet* where an operator is working at a desk should be built to meet to meet safety standards, and

[240] EX1004, [0032].

so necessarily would be insulated with a fire resistant or retardant material. Initially, as discussed above in Section VIII.F and with regards to claims 1 and 7, a wall would be necessary to separate the occupant and any electrical/electronic equipment from a potential release of flammable/combustible liquids and to allow less expensive easier to install electrical and electronic equipment. Further, a POSITA would recognize that an "occupant compartment," such as is described in both *Cable* and *Van Vliet* would need to follow applicable industry standards and regulations. As described above in Section VIII.G, one such standard is FMVSS TP-302-03, promulgated by the US Department of Transportation (US DOT) under the guise of the National Highway Traffic Safety Administration (NHTSA). This standard requires any material inside or within ½ inch of the occupant compartment air space to be constructed of fire-retardant material which has a burn rate of less than 4 inches per minute.[241] The list of materials included in TP-302-3, and in the associated federal regulation, includes insulating materials. Further, a POSITA would be motivated to construct the occupant compartment not only to adhere to the standard, but also the protect the occupant (operator) in the case of a fire in the fuel tank compartment, in order to provide increased safety for the operator. Increasing safety

[241] *See supra.* Section VIII.G, *see also* US DOT TP-302-3, 49 CFR §571.302

by engineering controls, such as fire retardant materials, would have been well known to a POSITA long before the '805 Patent.

198. To the extent that *Van Vliet* does not teach "a fire resistant or retardant material," it would have been obvious to one skilled in the art at the time of the '805 Patent seeking to meet safety standards, to protect operators, and to use fire resistant or retardant insulating material for at least the reasons discussed above. Therefore, Claim 10 is rendered obvious by *Van Vliet* in view of *Cable* and the knowledge of a POSITA regarding appropriate federal and industry standards and regulations.

**12. Claim 11: "The distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3"**

199. For the reasons discussed above with respect to Claim 4, in Section XI.A.5 and incorporated herein, *Van Vliet* in view of *Cable*, when using aisle width regulations and reel diameter values typical in the industry teaches an aisle-width-to-reel-diameter ratio of 1.588, which renders obvious the claimed "the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3."[242] Accordingly, the combination of *Van Vliet* and *Cable*, combined with the knowledge of a POSITA regarding safety regulations, renders obvious Claim 11.

[242] *See supra.* Section XI.A.5.

**13. Claim 12: "The distribution station as recited in claim 11, wherein the aisle width is greater than the reel diameter by a factor of at least 1.5"**

200. For the reasons described above with respect to Claim 4 in Section XI.A.5 and incorporated herein, *Van Vliet* in view of *Cable*, when using aisle width regulations and reel diameter values typical in the industry teaches an aisle-width-to-reel-diameter ratio of 1.588, which renders obvious the claimed "at least 1.5."[243] Accordingly, *Van Vliet* in view of *Cable* teaches "[t]he distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.5." The combination of *Van Vliet* and *Cable*, combined with the knowledge of a POSITA regarding safety regulations, renders obvious Claim 12.

**14. Claim 13: "The distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the mobile trailer has a trailer width, and a ratio of the trailer width to the aisle width is no greater than 5."**

201. *Cable* discloses that "the aisle walkway has an aisle width and the mobile trailer has a trailer width, and a ratio of the trailer width to the aisle width is no greater than 5." As discussed above with respect to Claim 1, FIG. 2 of *Cable*

[243] *See supra* Section XI.A.5.

teaches a distribution station having an aisle walkway along the length of the trailer:[244]

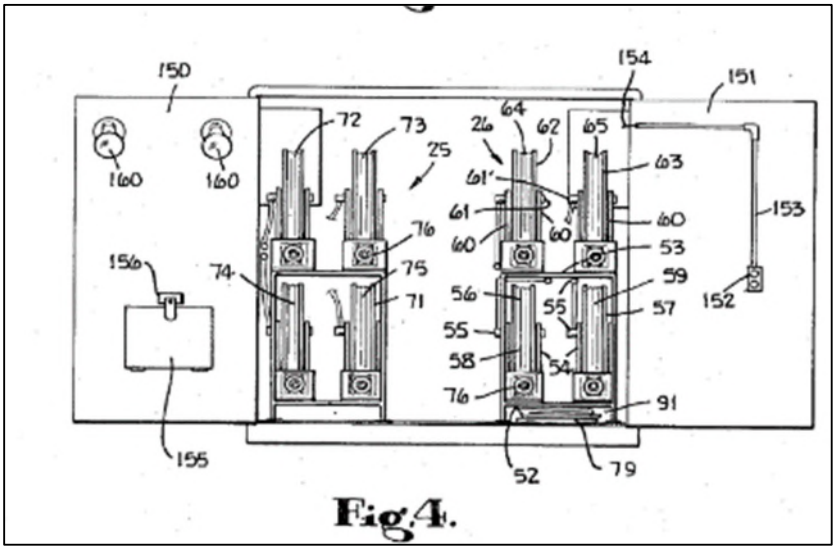


Fig.4.

202. FIG. 4 (depicted above) was printed and measured at its original aspect ratio. The aisle walkway width measured 1.00 inches, and the trailer width measured 3.38 inches:[245]

[244] EX1005, FIG. 4.

[245] EX1005, FIG. 4 (annotated to show relevant measurements).

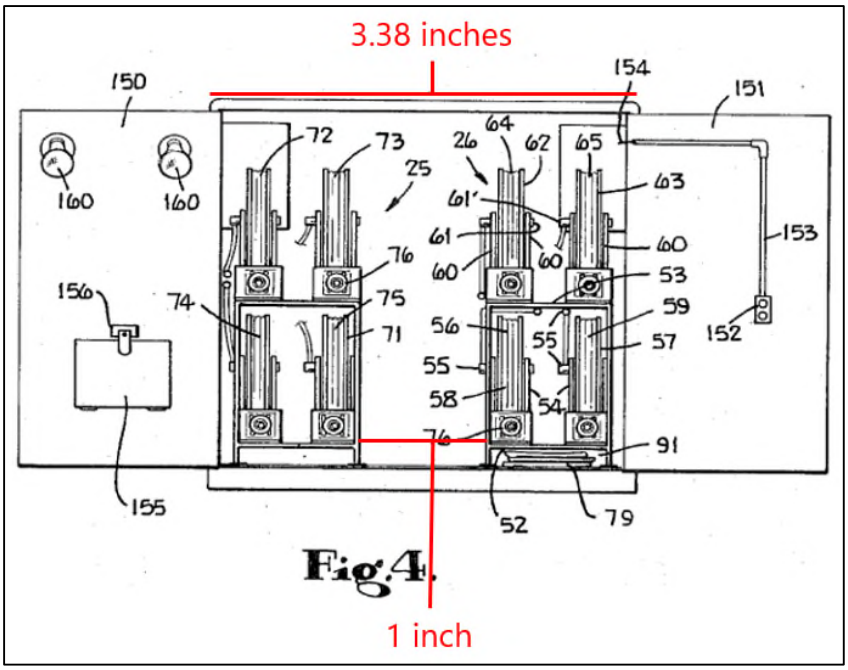


Fig.4.

These measurements yield a trailer-width-to-aisle-width ratio of 3.38. Thus, *Cable* discloses that the ratio of the trailer width to the aisle width does not exceed 5.

203. Further, a POSITA would recognize the necessity of adhering to various industry and governmental regulations and standards when designing/constructing the trailer of *Van Vliet/Cable*. As discussed above with respect to Claim 5, one set of regulations limit the reasonable width of a trailer intending to service oil and gas drilling and fracturing operations to 96" wide, particularly on the State and County maintained roads where many fracturing jobs occur. Further, as discussed regarding Claim 4, OSHA regulations require an exit walkway to be no less than 28" wide. Accordingly, using the maximum trailer width and minimum aisle width, the ratio between trailer and aisle widths would be:

$$^{96}/_{28} = 3.43$$

204. Accordingly, a configuration which simply follows the appropriate regulations would create a spatial orientation of the aisle and trailer width which meets the limitation claimed in Claim 13.

205. Alternatively, to the extent *Cable* does not expressly disclose this element, a POSITA would have understood that this would be an obvious design choice. *Van Vliet* notes that the spatial orientation of the reels **30**, manifolds **36** and **38**, tanks **18** and **20**, and other equipment shown "is a matter of design choice for the manufacturer and will depend on space requirements."[246] In view of the regulations described above, and the disclosure of *Cable*, it would have been an obvious matter of design choice to design the distribution station of *Van Vliet*, as modified by *Cable*, so that the trailer width is greater than the aisle width by a factor of no greater than 5, to, for example, to meet the appropriate safety standards and regulations. Accordingly, the combination of *Van Vliet* and *Cable*, combined with the knowledge of a POSITA regarding safety regulations, renders obvious Claim 13.

[246] EX1004, [0027].

**15. Claim 14: "The distribution station as recited in claim 13, wherein the ratio of the trailer width to the aisle width is greater than 2."**

206. *Cable* teaches that "the ratio of the trailer width to the aisle width is greater than 2." For the reasons described above with respect to Claim 13, *Cable* teaches a trailer-width-to-aisle-width ratio of 3.38.[247] Alternatively, for the reasons described above with respect to claim 13, a POSITA modifying *Van Vliet*'s trailer to include *Cable*'s walkway and meeting applicable safety regulations would have employed a trailer-width-to-aisle-width ratio of around 3.43.[248] In either case, a POSITA would have understood that *Van Vliet* in view of *Cable* renders obvious that "the ratio of the trailer width to the aisle width is greater than 2." Accordingly, the combination of *Van Vliet* and *Cable*, combined with the knowledge of a POSITA regarding safety regulations, renders obvious Claim 14.

**16. Claim 15: "The distribution station as recited in claim 1, wherein the ratio of the trailer width to the aisle width is equal to or less than 4"**

207. *Cable* teaches that "the ratio of the trailer width to the aisle width is equal to or less than 4." For the reasons described above with respect to Claim 13, *Cable* teaches a trailer-width-to-aisle-width ratio of 3.38. [249]Alternatively, for the

[247] *See supra* Section XI.A.14.; *see* EX1005, FIG. 4.

[248] *See supra.* Section XI.A.14.

[249] *See supra.* Section XI.A.14.; *see also* EX1005, FIG. 4.

reasons described above with respect to Claim 13, a POSITA modifying *Van Vliet*'s trailer to include *Cable*'s walkway, and meeting applicable safety standards and regulations would have employed a trailer-width-to-aisle-width ratio of around 3.43[250] In either case, a POSITA would have understood that *Van Vliet* in view of *Cable* renders obvious that "the ratio of the trailer width to the aisle width is equal to or less than 4." Accordingly, the combination of *Van Vliet* and *Cable*, combined with the knowledge of a POSITA regarding safety regulations, renders obvious Claim 15.

### 17. Claim 16: "The distribution station as recited in claim 1, further comprising a floor pan in the mobile trailer."

208. *Van Vliet* discloses that the distribution station "further compris[es] a floor pan in the mobile trailer." *Van Vliet* describes "spill containment pans" on board the trailer. *Van Vliet* describes "[o]ne or more spill containment pans (not shown ) [that] may be provided with the system." *Van Vliet* discloses that the pans are sized to catch leaks in the trailer. For example, a pan of sufficient size to catch leaking fluids from the system during use. Like the '805 Patent, *Van Vliet* describes that such pans may be positioned to catch fluids leaking from the manifolds and hose reels: "The pan or pans may be positioned to catch fluids from each or both manifolds, and hose reels **30**. Each manifold may have a single pan, or a single pan

[250] *See supra.* Section XI.A.14.

may be used for both manifolds." [251]These pans are described strikingly similarly to the pans in '805 Patent, which teaches the floor plan is sized and positioned "such that any fluid or fuel that leaks in the trailer is caught and contained in the floor pan."[252]

209. Further, codes and standards, including IFC-2015, require secondary containment and spill protection in locations that handle flammable and combustible liquids.[253] A POSITA would recognize the necessity of providing secondary containment and spill protection, such as a floor plan, in the system of *Van Vliet* and *Cable* to comply with industry codes and standards. Accordingly, a POSITA would have understood that the limitations of claim 16 are rendered obvious by *Van Vliet* in view of *Cable* along with the knowledge of a POSITA regarding fire codes and standards.

**18. Claim 17**

210. For the reasons discussed in the sections below, the combination of Van Vliet and Cable, along with the knowledge of a POSITA regarding industry codes, standards and regulations renders obvious Claim 17.

[251] EX1004, [0022].

[252] EX1001, 9:34-39.

[253] *See supra* Section VII.F.

**a. Claim 17[p]: "17. A distribution station comprising:**

211. The preamble is identical to the preamble of Claim 1 and is disclosed by *Van Vliet* and *Cable* for the same reasons as those set forth in Section XI.A.2.a above. Accordingly, the preamble is disclosed and rendered obvious, by both *Van Vliet* and *Cable,* and the combination of the two references.

**b. Claim 17[a]: "a mobile trailer,"**

212. Claim 17[a] is identical to Claim 1[a] and is disclosed by *Van Vliet* and *Cable* for the same reasons as those set forth in Section XI.A.2.b above and incorporated herein. Accordingly Claim 17[a] is disclosed and least rendered obvious, by both *Van Vliet* and *Cable,* and the combination of *Van Vliet* and *Cable*.

**c. Claim 17[b]: "a pump on the mobile trailer,"**

213. Claim 17[b] is identical to Claim 1[b] and is disclosed by *Van Vliet* and *Cable* for the same reasons as those set forth in Section XI.A.2.c above and incorporated herein. Accordingly Claim 17[b] is disclosed and least rendered obvious, by both *Van Vliet* and *Cable,* and the combination of the two references.

**d. Claim 17[c]: "first and second manifolds on the mobile trailer and fluidly connected with the pump,"**

214. Claim 17[c] is identical to Claim 1[c] and is disclosed by *Van Vliet* for the same reasons as those set forth in Section XI.A.2.d above and incorporated

herein. Accordingly Claim 17[c] is disclosed by *Van Vliet* and rendered obvious by *Van Vliet* and the combination of the *Van Vliet* and *Cable*.

**e. Claim 17[d]: "a plurality of reels on the mobile trailer,"**

215. Claim 17[d] is identical to Claim 1[d] and is disclosed by *Van Vliet* and *Cable* for the same reasons as those set forth in Section XI.A.2.e above and incorporated herein. Accordingly, Claim 17[d] is disclosed and least rendered obvious, by both *Van Vliet* and *Cable*, and the combination of the two references.

**f. Claim 17[e]: "a plurality of hoses connected, respectively, with the reels, wherein a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold;"**

216. Claim 17[e] is like Claim 1[e], with the addition of a specific configuration of manifolds and reels. *Van Vliet* discloses "a plurality of hoses connected, respectively with the reels" for the same reasons as set forth regarding Claim 1[e] in Section XI.A.2.f above and incorporated herein. Further, *Van Vliet* also discloses "wherein a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold." FIG. 1 of *Van Vliet* shows just such an arrangement.[254]

[254] EX1004, FIG.1 (annotated to show reels, those connected to manifold 36 (green) in red and those connected to manifold 38 (yellow) in blue).

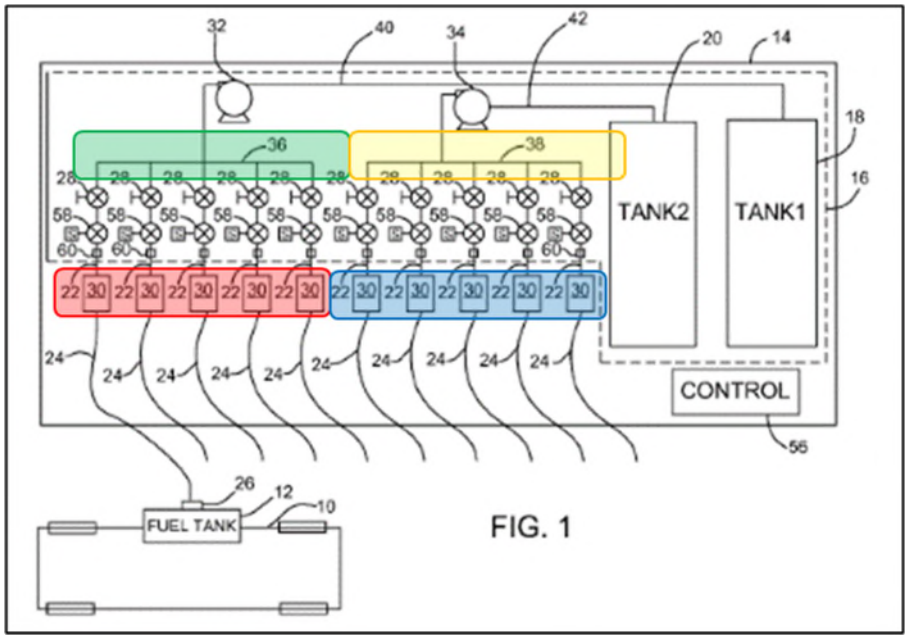



FIG. 1

217. As seen in the annotated FIG. 1 above, the figure shows two manifolds, labeled **36** and **38**. (annotated in green and yellow respectively). Connected to manifold **36** are a portion of the reels, labeled as **30**, and annotated in red. Similarly, connected to manifold **38** are a portion of the reels, again labeled as **30**, which are annotated in blue. *Van Vliet* also supplies a description of particular embodiments of the system of *Van Vliet* which contain the claimed limitation. For example, *Van Vliet* discloses "The number of outlets **22** on a manifold **36**, **38** may vary and depends largely on space restrictions. Five outlets **22** per manifold **36**, **38** is convenient for a typical large fracturing job and not all the outlets **22** need be used. Using more than one manifold permits redundancy in case one manifold develops a leak." A POSITA would have understood, based on FIG. 1 of *Van Vliet* and the description in the specification of *Van Vliet* that the "outlets **22**" each connect, through a series of

valves, to the reels. Accordingly, *Van Vliet* discloses the limitation claimed in Claim element 17[e], and the combination of *Van Vliet* and *Cable* render this claim limitation obvious.

**g. Claim 17[f]: "a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses;"**

218. Claim 17[f] is identical to Claim 1[f] and is disclosed by *Van Vliet* for the same reasons as those set forth in Section XI.A.2.d above and incorporated herein. Accordingly Claim 17[f] is disclosed by *Van Vliet* and rendered obvious by *Van Vliet* and the combination of the *Van Vliet* and *Cable*.

**h. Claim 17[g]: "a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses;"**

219. Claim 17[g] is identical to Claim 1[g] and is disclosed by *Van Vliet* for the same reasons as those set forth in Section XI.A.2.d above and incorporated herein. Accordingly Claim 17[g] is disclosed by *Van Vliet* and rendered obvious by *Van Vliet* and the combination of the *Van Vliet* and *Cable*.

**i. Claim 17[h]: "wherein the mobile trailer includes first and second opposed trailer side walls, and a first group of the hoses are deployable from the first trailer side wall and a second group of the hoses are deployable from the second trailer side wall."**

220. *Van Vliet* teaches or discloses "wherein the mobile trailer includes first and second opposed trailer side walls, and a first group of the hoses are deployable from the first trailer side wall and a second group of the hoses are deployable from the second trailer side wall."

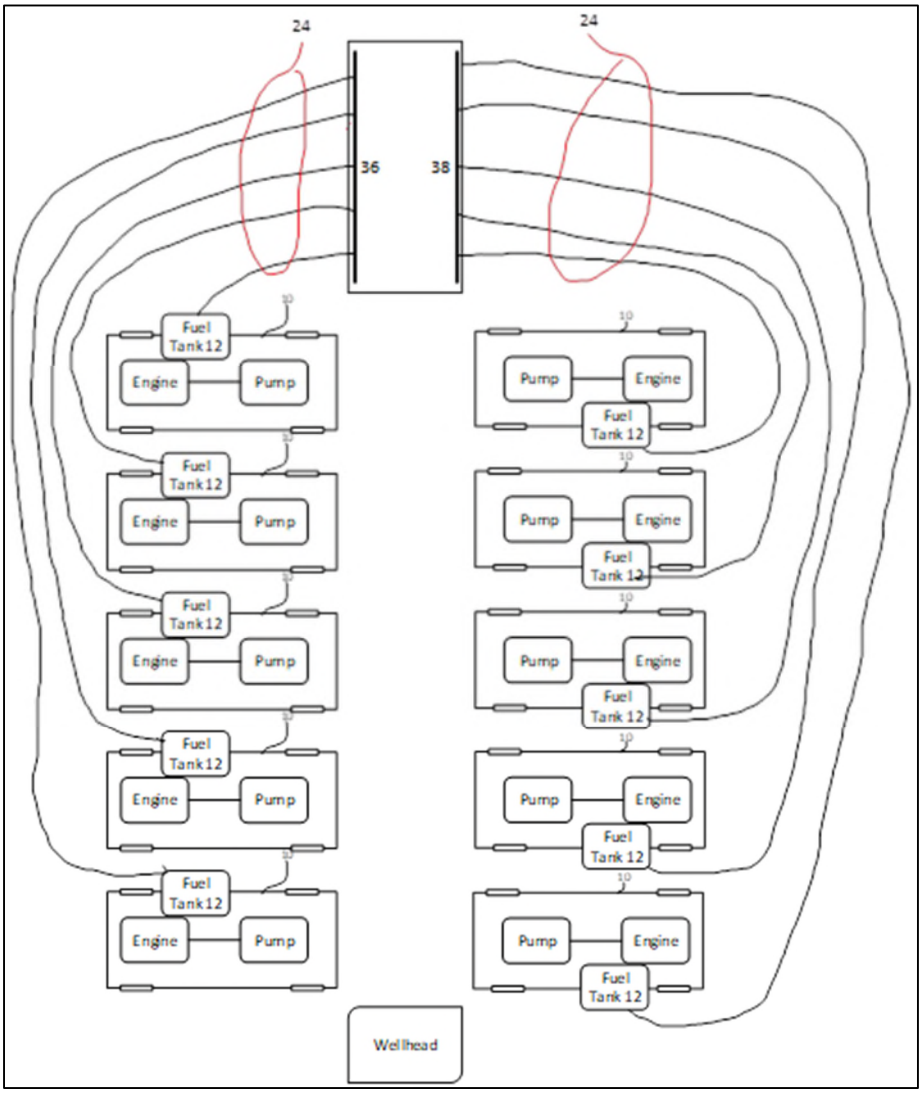
221. *Van Vliet* discloses a mobile trailer having first and second opposed trailer side walls.[255] The hoses of *Van Vliet* "are run out to equipment **10** through an ***opening in the trailer wall*** in whatever arrangement the well operator has requested that the fracturing equipment be placed around the well."[256] In an embodiment, *Van Vliet*'s manifolds and associated hoses are arranged such that "one manifold **36** may supply fluid to equipment **10** lined up on ***one side of a well***, while another manifold **38** may supply fluid to equipment **10** lined up on ***the other side***."[257] A POSITA would have understood this disclosure describes two groups of hoses each deployable through one of two opposite side walls. For example, the diagram below

[255] EX1004, [0014], [0024], and [0026].

[256] EX1004, [0024] (emphasis added).

[257] EX1004, [0024] (emphasis added).

shows the trailer of *Van Vliet* in one configuration, consistent with the disclosure of *Van Vliet*, whereby *Van Vliet's* trailer is backed toward the well, and is feeding equipment on one side of the well from manifold 36 and equipment on the other side of the well from manifold 38. Also, consistent with *Van Vliet*, the hoses 24 are deployed out to equipment 10 through the respective side walls.[258]




[258] This drawing illustrates my understanding of the layout disclosed in *Van Vliet*.

222. Alternatively, to the extent that *Van Vliet* does not explicitly disclose hoses deployable through two opposite side walls, it would have been obvious to a POSITA to arrange the system of *Van Vliet* such that the hoses are deployed through two opposite side walls. *Van Vliet* discloses that its hose arrangement may be "whatever arrangement the well operator has requested."[259] *Van Vliet* further discloses that each of its two manifolds and associated hoses may be assigned to or associated with a respective opposite side of a well.[260] The most obvious arrangement for a POSITA seeking to connect each of *Van Vliet*'s manifolds to a respective opposite side of a well would be an arrangement in which the trailer faces directly toward or away from the well and the hoses extend from each side of the trailer to a corresponding side of the well.[261] This would allow the hoses to be extended a minimal length, as well as reducing crossing and clutter of hoses at the wellsite, as shown in the diagram above.

223. Thus, for at least the reasons discussed above, a system "wherein the mobile trailer includes first and second opposed trailer side walls, and a first group of the hoses are deployable from the first trailer side wall and a second group of the

[259] EX1004, [0024].

[260] EX1004, [0024].

[261] S*ee* EX1004, [0024].

hoses are deployable from the second trailer side wall" as claimed in Claim 17[h] is anticipated or at least rendered obvious by *Van Vliet* and the combination of *Van Vliet* and *Cable.*

**19. Claim 18: "The distribution station as recited in Claim 17, wherein the reels are arranged on first and second opposed sides in the mobile trailer such that there is an aisle walkway down the middle of the mobile trailer"**

224. Claim 18 is identical to Claim 1[h] (other than being a dependent claim) and is disclosed by *Cable* for the same reasons as those set forth in Section XI.A.2.i above and incorporated herein. Accordingly Claim 18 is disclosed by *Cable* and rendered obvious by *Van Vliet* and the combination of the *Van Vliet* and *Cable*.

**20. Claim 19: "The distribution station as recited in Claim 18, wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels"**

225. Claim 19 is essentially identical to Claim 2 (other than the references to different independent claim numbers) and is disclosed by *Cable* for the same reasons as those set forth in Section XI.A.3 above and incorporated herein. Accordingly Claim 19 is disclosed by *Cable* and rendered obvious by *Van Vliet* and the combination of the *Van Vliet* and *Cable*.

**21. Claim 20: "The distribution station as recited in Claim 19, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3"**

226. Claim 20 is essentially identical to Claim 4 (other than the references to different independent claim numbers) and is disclosed by *Cable* for the same reasons as those set forth in Section XI.A.5 above and incorporated herein. Accordingly Claim 20 is disclosed by *Cable* and rendered obvious by *Van Vliet* and the combination of the *Van Vliet* and *Cable*.

**22. Claim 21: "The distribution station as recited in claim 20, wherein the mobile trailer has a trailer width of no greater than about 96 inches."**

227. Claim 21 is essentially identical to Claim 5 (other than the references to different independent claim numbers) and is disclosed by *Van Vliet* and *Cable* (along with the knowledge of a POSITA regarding trailer width regulations) for the same reasons as those set forth in Section XI.A.6 above and incorporated herein. Accordingly Claim 21 is disclosed by *Van Vliet* and *Cable* (with the knowledge of a POSITA) and rendered obvious by *Van Vliet* and the combination of the *Van Vliet* and *Cable*.

**23. Claim 22: "The distribution station as recited in claim 17, further comprising a floor pan in the mobile trailer."**

228. Claim 22 is essentially identical to Claim 16 and is disclosed by *Van Vliet* for the same reasons as those set forth in Section XI.A.17 above and

incorporated herein. Accordingly Claim 22 is disclosed by *Van Vliet* and rendered obvious by *Van Vliet* and the combination of the *Van Vliet* and *Cable*.

### B. Ground 2: Claims 17 and 18 are anticipated by and/or obvious in view of *Van Vliet*

#### 1. Claim 17

229. For the reasons described below, Claim 17 is disclosed and anticipated by, or at least rendered obvious by, *Van Vliet*. It is my opinion that the examiner erred in finding that reels arranged on and fed through opposing side walls with an aisle therebetween was not disclosed by *Van Vliet*.[262]

**a. <u>Claim 17[p]-[g]: "A distribution station comprising: a mobile trailer; a pump on the mobile trailer, first and second manifolds on the mobile trailer and fluidly connected with the pump; a plurality of reels on the mobile trailer; a plurality of hoses connected, respectively, with the reels, wherein a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold; a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses: and a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses"</u>**

230. *Van Vliet* discloses limitations 17[p]-17[g] as described in Sections XI.A.2.Claim 1[p]-Claim 1[g] and incorporated herein. Sections XI.A.2.a - XI.A.2.i. Accordingly, *Van Vliet* anticipates Claims 17[p]-17[g].

[262] See Section VII.C.

**b. Claim 17[h]: "wherein the mobile trailer includes first and second opposed trailer side walls, and a first group of the hoses are deployable from the first trailer side wall and a second group of the hoses are deployable from the second trailer side wall."**

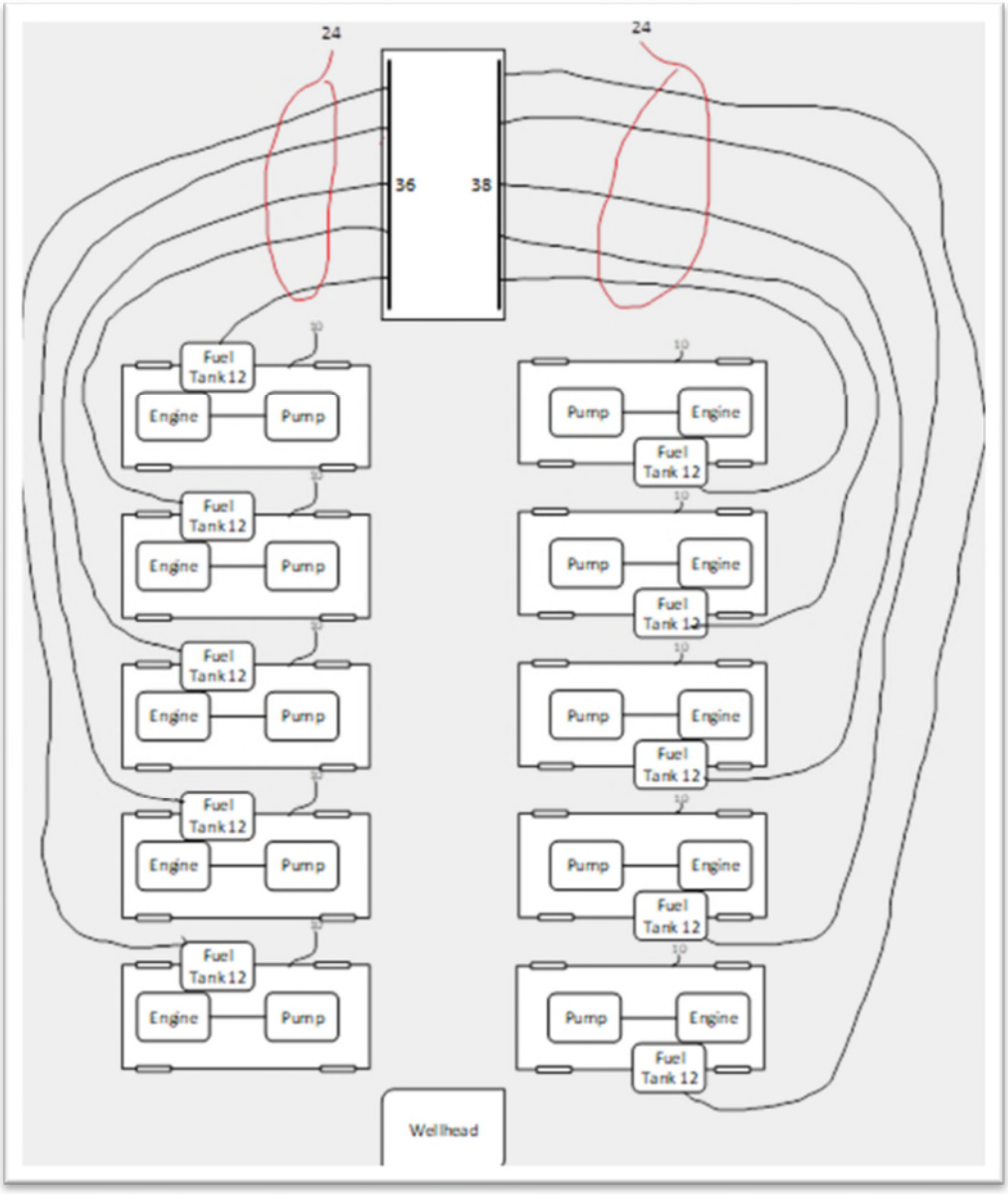
231. *Van Vliet* also teaches or discloses element 17[h]. *Van Vliet* discloses a mobile trailer having first and second opposed trailer side walls.[263] The hoses of *Van Vliet* "are run out to equipment 10 through an opening in the trailer wall in whatever arrangement the well operator has requested that the fracturing equipment be placed around the well."[264] In an embodiment, *Van Vliet*'s manifolds and associated hoses are arranged such that "one manifold 36 may supply fluid to equipment 10 lined up on one side of a well, while another manifold 38 may supply fluid to equipment 10 lined up on the other side." [265] A POSITA would have understood this disclosure describes two groups of hoses each deployable through one of two opposite side walls. For example, the diagram below shows the trailer of *Van Vliet* in one configuration, consistent with the disclosure of *Van Vliet*, whereby *Van Vliet*'s trailer is backed toward the well, and is feeding equipment on one side of the well from manifold **36** and equipment on the other side of the well from manifold **38**. Also,

[263] EX1004, [0014], [0024], & [0026].

[264] EX1004, [0024], emphasis added.

[265] EX1004, emphasis added.

consistent with *Van Vliet*, the hoses **24** are deployed out to equipment **10** through the respective sidewalls.[266]




[266] This drawing illustrates my understanding of the layout disclosed in *Van Vliet*.

232. Thus, for at least the reasons discussed above, a system "wherein the mobile trailer includes first and second opposed trailer side walls, and a first group of the hoses are deployable from the first trailer side wall and a second group of the hoses are deployable from the second trailer side wall" as claimed in Claim 17[h] is anticipated by *Van Vliet*.

233. Alternatively, to the extent that *Van Vliet* does not explicitly disclose hoses deployable through two opposite side walls, it would have been obvious to a POSITA to arrange the system of *Van Vliet* such that the hoses are deployed through two opposite side walls. *Van Vliet* discloses that its hose arrangement may be "whatever arrangement the well operator has requested."[267] *Van Vliet* further discloses that each of its two manifolds and associated hoses may be assigned to or associated with a respective opposite side of a well.[268] The most obvious arrangement for a POSITA seeking to connect each of *Van Vliet*'s manifolds to a respective opposite side of a well would be an arrangement in which the trailer faces directly toward or away from the well and the hoses extend from each side of the trailer to a corresponding side of the well.[269]

[267] EX1004, [0024].

[268] EX1004, [0024].

[269] EX1004, [0024].

**2. Claim 18: "The distribution station as recited in claim 17, wherein the reels are arranged on first and second opposed sides in the mobile trailer such that there is an aisle walkway down the middle of the trailer."**

234. *Van Vliet* teaches arranging the hoses to be deployable from each opposing side wall of the trailer. A POSITA would have recognized that, in that arrangement, the reels would not be arranged along only one side wall at least because this would result in a tripping hazard that would obstruct the exit route. Therefore, the most obvious arrangement would be to arrange the reels carrying the hoses along the first and second opposed side walls of the trailer.

235. *Van Vliet* also explains that its hoses have "manually operated valves **28**" capable of providing "emergency shut down."[270] These valves **28** are illustrated in *Van Vliet*'s system downstream of the manifolds **36** and **38** and upstream of reels **30** as shown in below:[271]

[270] EX1004, [0023].

[271] EX1004, FIG. 1, [0016] ("manually controlled valves **28** are preferably located on and formed as part of the manifolds **36**, **38**.").

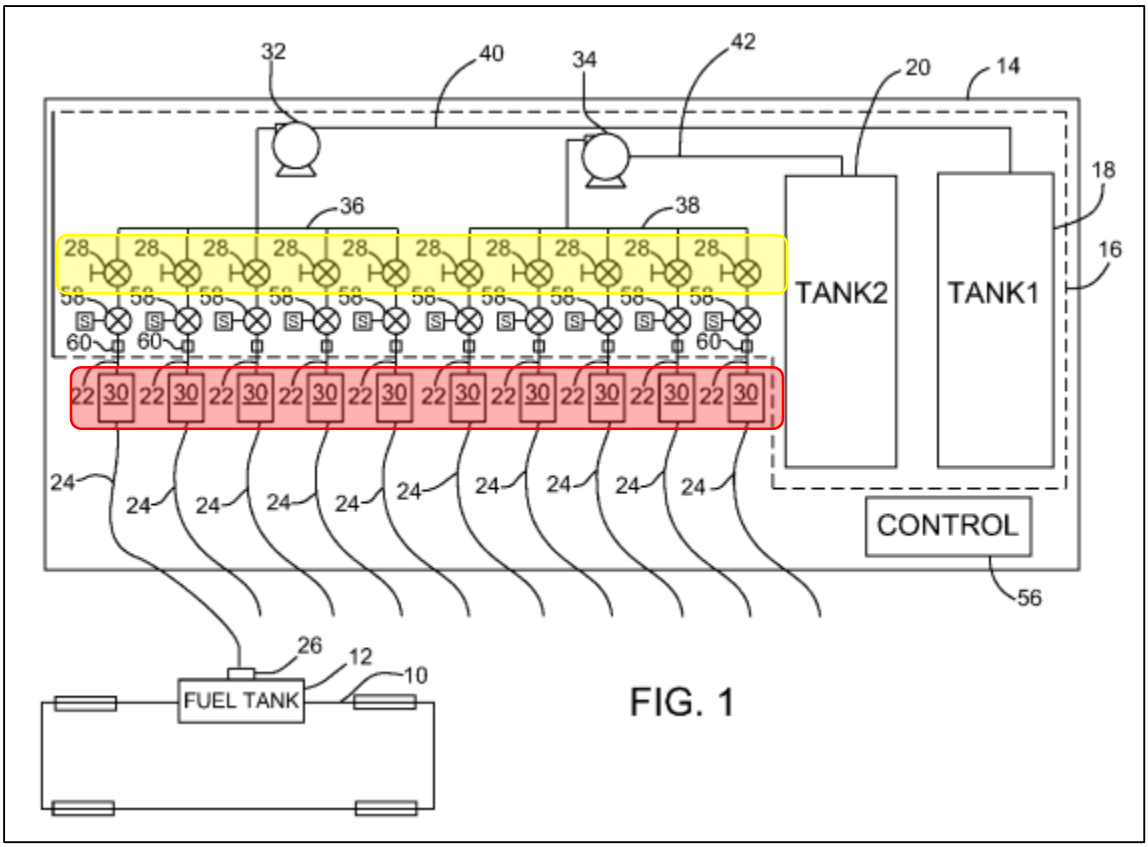



FIG. 1

236. A POSITA implementing *Van Vliet*'s system would have recognized that in order to implement the ***manually-operated*** valves, an operator would need to have access to them. With reels and hoses arranged on ***both*** sides of the trailer, as *Van Vliet* discloses or teaches (as described above with regard to Claim 17[h]), it would have been necessary to include an aisle walkway down the middle of the trailer to provide access to these valves. Accordingly, *Van Vliet* anticipates Claim 18.

### C. Ground 3: Claims 9-10 are rendered obvious by *Van Vliet* in view of *Cable* and *AFD*

#### 1. Rationale and motivation for combining *Van Vliet* and *Cable* with *AFD*

237. The rationale and motivation for combining *Van Vliet* and *Cable* is the same as discussed for Ground 1 and is incorporated herein.[272] A POSITA would have been further motivated to combine *AFD* with *Van Vliet* (as modified by *Cable*). *AFD* is in the same field of endeavor as *Van Vliet* and *Cable* (as well as the '805 Patent) and is directed to solving the same problem—delivering hydrocarbon fluids from a mobile trailer via hoses to multiple pieces of equipment. More specifically, both *Van Vliet* and *AFD* involve mobile refueling systems. *AFD* is therefore analogous art to both *Van Vliet* and *Cable*, as well as the claims of the '805 Patent.[273]

238. To the extent that the board determines that *Van Vliet* does not teach a controller in a second compartment, or fire-retardant insulation in the second compartment, it would have been obvious to a POSITA to combine *AFD*'s control system, compartment configuration, and hose configuration with *Van Vliet* (as modified by *Cable*). A POSITA would recognize the benefits of the control

[272] *See supra.* Section XI.A.1.

[273] EX1001, 1:22-35; *see also* EX1004, [0003], [0014], and Abstract; EX1005, 1:40-65; EX1007, 2-3.

compartment of *AFD*, including having the controller in the compartment with the operator. *Van Vliet* already teaches "A cabin [] for example comprising a heater, desk, and access to relevant control equipment. [] A dashboard may be visible from the cabin, the dashboard containing readouts of system characteristics such as fuel tank **12** levels." A POSITA would be motivated to combine this teaching with the teaching of *AFD* that the controller, and the dashboard, are in the cabin with the operator to take advantage of the ease of interaction between the operator and the dashboard that *AFD* provides. This would have predictably enabled *Van Vliet*'s system (as modified by *Cable*) to distribute fuel more safely and efficiently, as the operator would monitor and adjust parameters relating to fuel delivery without having to leave the cabin.

239. *AFD* is like both *Cable* and *Van Vliet*. Both *Van Vliet* (as modified by *Cable*) and *AFD* include (1) a mobile trailer within the meaning of the '805 Patent;[274] (2) a storage tank on the mobile trailer;[275] (3) reels on the mobile trailer;[276] (4) hoses

[274] EX1004, FIG. 5; EX1007, 2.

[275] EX1004, [0003], [0014]; EX1007, 2.

[276] EX1004, [0015]; EX1007, 2.

on the reels;[277] (5) a pump on the mobile trailer coupled to the storage tank;[278] and (6) valves for controlling the flow of a fluid.[279]

240. A POSITA would have been motivated to further modify *Van Vliet* (as modified by *Cable*) to include *AFD*'s control system, for example, to achieve efficient control of the mobile fuel delivery system's hoses. *Van Vliet* discloses a control station[280], a control cabin,[281] and fuel level sensors associated with hoses,[282] but does not disclose all the functionality of those systems. *AFD*'s control system is used in the context of a similar refueling system, and *AFD* describes the functionality of AFD's "Intuitive Control Panel" useful to "control and provide fuel status for each reel and the main tank."[283] A POSITA would have found it desirable to use *AFD*'s disclosure in the *Van Vliet* control system to efficiently control fuel delivery to through the various reels to the equipment tanks, and to monitor the main fuel tank. Furthermore, *Van Vliet* discusses the importance of addressing fire hazards,[284]

[277] EX1004, [0015]; EX1007, 3.

[278] EX1004, [0014]; EX1007, 2.

[279] EX1004, [0003], [0014]; EX1007, 3 (providing for control of each reel).

[280] EX1004, [0018].

[281] EX1004, [0031].

[282] EX1004, FIG. 2.

[283] EX1007.

[284] *See*, for example, EX 1004, Abstract & [0002]

and *AFD* expressly states the AFD system "has been built to meet and exceed fire code and hazardous location standards" for that purpose.[285] A POSITA would have recognized the advantage of augmenting *Van Vliet*'s control systems with *AFD*'s control system architecture and fire safety precautions.

241. Further, *Van Vliet* contains an express motivation to combine. The combination would further *Van Vliet's* goal of a manual override of electrically operated valves: "Having a manual override may be important to a customer. Manual override may be provided by using valves **28**, and may also be provided on an electrically operated valve **58**".[286] An operator, in the combination, would interact with the "Intuitive Control Panel", such as those in AFD, in order to effect an override of *Van Vliet's* "electrically operated valve **58**" through the control system, such as *Van Vliet's* controller **56**. Such a combination would be advantageous in that the operator could perform a manual override from the relative safety and comfort of the operator's cabin, rather than needing to go into the fuel distribution compartment to manually override the valves.

242. *Van Vliet* contains an additional express motivation to combine. *Van Vliet* teaches a mobile trailer having first and second opposed trailer side walls.[287]

[285] EX1007, 2.

[286] EX1004 ¶[0020]

[287] EX1004, [0014], [0024], & [0026].

The hoses of *Van Vliet* "are run out to equipment **10** through an opening in the trailer wall in whatever arrangement the well operator has requested that the fracturing equipment be placed around the well."[288] In an embodiment, *Van Vliet*'s manifolds and associated hoses are arranged such that "one manifold **36** may supply fluid to equipment **10** lined up on one side of a well, while another manifold **38** may supply fluid to equipment **10** lined up on the other side."[289] To the extent not already disclosed by *Van Vliet*, a POSITA would be motivated to incorporate the specific teachings of AFD's hose deployment configuration (i.e. through both a first and second sidewall) to help meet the goal of *Van Vliet* of serving equipment on one side of the well from one manifold and equipment on the other side of the well from a separate manifold. This would have predictably enabled *Van Vliet*'s system to more safely and efficiently distribute fuel by reducing the hoses to be extended a minimal length, as well as reducing crossing and clutter of hoses at the wellsite.

243. A POSITA would have had a reasonable expectation of success in combining *AFD* with *Van Vliet* (as modified by *Cable*). *AFD* and *Van Vliet* are highly similar, and the aspects of *AFD* added to *Van Vliet* (control system architecture and the arrangement of hoses) merely modify existing elements of *Van*

[288] EX1004, [0024] (emphasis added).

[289] EX1004, [0024] (emphasis added)

*Vliet* rather than add new elements. Incorporating *AFD*'s control system architecture, fire and hazardous area protection, and arrangement of hoses into *Van Vliet*'s mobile fuel delivery system would merely involve combining known prior art elements according to known methods to yield predictable results.

**2. Claim 9**: **"The distribution station as recited in claim 7, a controller in the second compartment, the controller configured to operate the valves."**

244. As discussed in Section XI.A.10, *Van Vliet* discloses that the distribution station of *Van Vliet* "further compris[es] a controller in the second compartment, the controller configured to operate the valves." *Van Vliet* teaches "A cabin [] for example comprising a heater, desk, and access to relevant control equipment. [] A dashboard may be visible from the cabin, the dashboard containing readouts of system characteristics such as fuel tank **12** levels."[290] A POSITA would recognize that this arrangement discloses "a controller in the second compartment, the controller configured to operate the valves", particularly in light of *Van Vliet's* teaching of manual override of the electrically operated valves, as discussed above.

245. To the extent that the board determines that *Van Vliet* does not teach a controller in a second compartment, the distribution station of *AFD* also includes a

[290] EX1004, [0032].

controller in the second compartment configured to operate the valves.[291] The control room of *AFD* is depicted below:[292]


246. The control room "contains two touch screen display monitors that *control and provide fuel status for each reel and the main tank*. The color coded monitoring system allows for easy recognition of each individual reel, as well as a visual of all 24 reels at one time."[293] A POSITA would have understood that the controller in the control room would control fuel levels of the system, including the sensed fuel levels of the equipment being fueled, described in AFD by controlling valves therein. Alternatively, to the extent that *AFD* does not expressly disclose that the controller controls the claimed valves, a POSITA would find it obvious to use

[291] EX1007, 2-3.

[292] EX1007, 2 (annotated to show control room highlighted in yellow).

[293] EX1007, 3.

the controller described in AFD to control at least *Van Vliet's* electrically (automatically) operated valves **58**, as described in Section XI.A.10.

247. Accordingly, for at least the reasons discussed above, "[t]he distribution station as recited in claim 7, further comprising a controller in the second compartment, the controller configured to operate the valves." is rendered obvious by *Van Vliet* in view of *Cable* and *AFD*.

**3. Claim 10: "The distribution station as recited in claim 9, wherein the second compartment is insulated with a fire resistant or retardant material."**

248. *AFD* teaches a distribution station "wherein the second compartment is insulated with a fire resistant or retardant material."[294] The self-contained unit of *AFD* (including the second compartment control room) "has been built to meet and exceed fire code and hazardous location standards."[295]A POSITA, based on the teaching of AFD and a POSITA's knowledge, would look to fire code and hazardous location standards, such as NEC-2014, IFC-2015, API 500 and NFPA 497. These standards would teach the placement of walls and other protections to protect a control compartment, such as the one depicted in AFD, and described in *Van Vliet*. Additionally, a POSITA would be informed by this statement to reference motor vehicle fire standards such as MVSS-302 (TP-302-3). As discussed in Section

[294] EX1007, 2.

[295] EX1007, 2 (annotated).

VIII.G, according to this US DOT standard, fire retardant materials, including insulating materials, must be used in occupant compartments, such as the one depicted in AFD and described in *Van Vliet.* Accordingly, Claim 10 is rendered obvious by *Van Vliet* in view of *Cable* and *AFD* along with the knowledge of a POSITA regarding industry Codes, Standards and Regulations.

### D. Ground 4: Claims 4, 11, 12 and 20 are rendered obvious by *Van Vliet* in view of *Cable* and *Coxreels*.

#### 1. Rationale and motivation for combining *Van Vliet* and *Cable* with *Coxreels*

249. The rationale and motivation for combining *Van Vliet* and *Cable* is the same as discussed for Ground 1 and is incorporated herein.[296] A POSITA would have been further motivated to combine *Coxreels* with *Van Vliet* (as modified by *Cable*). *Coxreels* is in the same field of endeavor as *Van Vliet* and *Cable* (as well as the '805 Patent) and is directed to solving the same problem—using reels to support hoses for use in distributing hydrocarbon liquids.[297] *Coxreels* is therefore analogous art to both *Van Vliet* and *Cable* as well as the '805 Patent claims.[298] A POSITA, based on the teachings of *Van Vliet* and *Cable* regarding storage of hoses on reels, would have

[296] *See supra.* Section XI.A.1.

[297] EX1001, 1:22-35; *see also* EX1004, [0003], [0014], Abstract; EX1005, 1:40-65; EX1008, 1.

[298] EX1001, 1:22-35; EX1004, [0003], [0014], Abstract; EX1005, 1:40-65; EX1008, 1.

been motivated to reference information on commercially available hose reels, such as the ones disclosed in *Coxreels* when designing the layout of the fuel distribution station. Information contained in *Coxreels*, such as dimensions and capacities of commercially available reels, would have been invaluable to the designer when evaluating the size, layout, location, and spatial orientation of equipment on the mobile distribution station.

250. It would have been obvious to a POSITA to use the specific reel described in *Coxreels*' in the system of *Van Vliet* (as modified by *Cable*). A POSITA would have been motivated to combine *Coxreels*' reel with the system of *Van Vliet* (as modified by *Cable*). *Van Vliet* discloses the use of reels.[299] A POSITA designing a system of *Van Vliet* would have looked to commercially available reel components like those described in *Coxreels*, among other reasons, as a cost-effective and readily available option (*e.g.*, as compared to a custom-made reel) for the building of that system. At the time of the '805 Patent, Coxreels were specifically market for use in the oil industry.[300] Accordingly, a POSITA would have recognized the advantage of using *Coxreels*' reel in *Van Vliet*'s mobile fuel delivery system. This would have

[299] EX1004, [0015]

[300] *See* EX1030, 5-6 (showing the 1125 series reels as an option on the "Petroleum" page).

predictably resulted in enabling *Van Vliet*'s system to operate using a specified reel of a specified size.

251. *Coxreels* describes the "1125 Series hand crank and motorized hose reels have the features demanded by industry professionals. *Coxreels* describes "industry preferred design features [such as] a sturdy one piece all welded 'A' frame base, low profile outlet riser and open drum slot design provides a non-crimping, flat smooth hose wrap."[301] A POSITA would have recognized the advantage of using *Coxreels*' reels with *Van Vliet*'s system (as modified by *Cable*), particularly to allow for easy design and construction of a hose reel distribution system with commercially available components.

252. A POSITA would have had a reasonable expectation of success in combining *Coxreels* with *Van Vliet* (as modified by *Cable*). To combine *Van Vliet* with *Coxreels*, a POSITA would have needed only to select *Coxreels*' reel when choosing which reel to implement. Incorporating *Coxreels*' reel into *Van Vliet*'s mobile fuel delivery system (as modified by *Cable*) would merely involve combining a known prior art reel according to known methods, installing and using the reel in a conventional way. Therefore, a POSITA would have expected that the

[301] EX1008.

*Coxreels* reel would work successfully and according to its known functionality in combination with *Van Vliet* and *Cable*.

**2. Claim 4: "The distribution station as recited in claim 3, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3"**

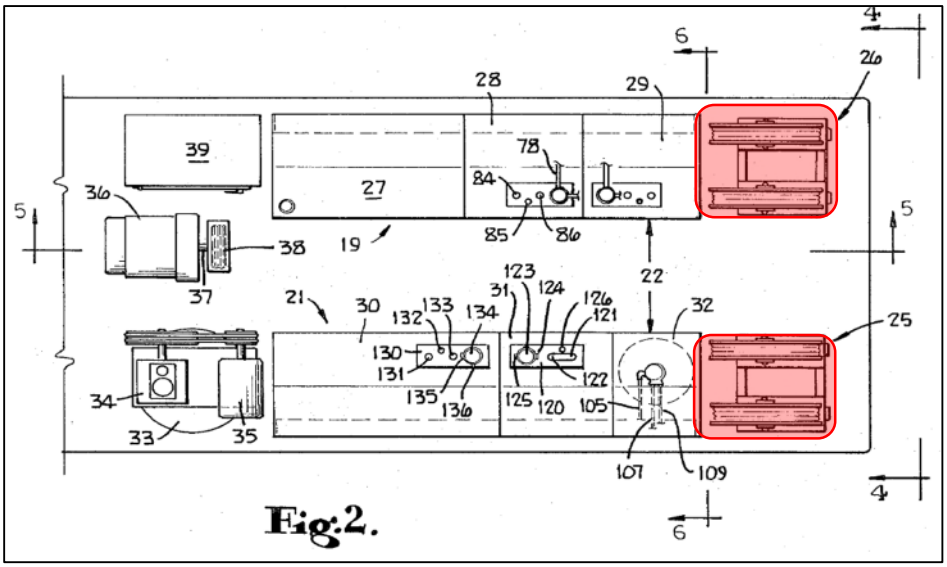
253. For at least the reasons discussed above with respect to Claim 4 in Ground 1, *Van Vliet* in view of *Cable* discloses "[t]he distribution station as recited in claim 3, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3."[302]

254. The combination of *Van Vliet* and *Cable* is further strengthened by incorporating *Coxreels*. *Coxreels* discloses reels having a diameter of 17 and 5/8 inches.[303] A system using *Coxreels*' reels and *Cable*'s aisle walkway would have a setup like the following, where the reels highlighted in red are the *Coxreels* reels:[304]

[302] *See supra.* Section XI.A.12.

[303] EX1008, 1.

[304] EX1005, FIG. 2 (annotated to show reels highlighted in red).




255. It would have been obvious to a POSITA to combine a mobile trailer having *Cable*'s layout of a reel on each side of a central aisle with *Coxreels*' 17-and-5/8-inch reels to achieve a wider, more easily accessible walkway. As discussed in Section VIII.C above, the maximum width of a vehicle which would have universal access to well sites (including ones on State and County maintained roads) is 96 inches. Additionally, a minimum aisle width of 28" is required by OSHA regulations.[305] A 28-inch aisle and a 17-and-5/8-inch reel would yield an aisle-width-to-reel-diameter ratio of 1.59, which is greater than the recited ratio of 1.3 given by claim 4. Accordingly, Claim 4 is rendered obvious by *Van Vliet* in view of *Cable* and *Coxreels*.

[305] EX1031.

**3. Claim 11: "The distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3"**

256. The limitations of claim 11 are identical to Claim 4 (other than referencing a different independent Claim) and are disclosed by *Cable* and *Coxreels* for the same reasons as those set forth in Section XI.D.2 above and incorporated herein. Accordingly Claim 11 is rendered obvious by the combination of the *Van Vliet*, *Cable* and *Coxreels*.

**4. Claim 12: "The distribution station as recited in claim 11, wherein the aisle width is greater than the reel diameter by a factor of at least 1.5"**

257. For the reasons described above with respect to Claim 11 in Section XI.D.2 and incorporated herein, *Van Vliet* in view of *Cable* and *Coxreels* teaches an aisle-width-to-reel-diameter ratio of 1.59.[306] Accordingly, *Van Vliet* in view of *Cable* and *Coxreels* teaches "[t]he distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.5." Thus, *Van Vliet* in view of *Cable* and *Coxreels* renders obvious Claim 12.

[306] *See supra.* Section XI.D.2

**5. Claim 20: "The distribution station as recited in Claim 19, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3"**

258. The limitations of claim 20 are identical to Claim 4 (other than referencing a different independent Claim) and are disclosed by *Cable* and *Coxreels* for the same reasons as those set forth in Section XI.D.2 above and incorporated herein.[307] Claim 19, from which Claim 20 depends, is obvious over the combination of *Van Vliet* and *Cable*.[308] Accordingly Claim 20 is rendered obvious by the combination of the *Van Vliet*, *Cable* and *Coxreels*.

## E. Ground 5: *Van Vliet* in view of *AFD* renders obvious Claims 1, 7-10, 13-18, and 22

### 1. Rationale and motivation for combining *Van Vliet* with *AFD*

259. A POSITA would have been motivated to combine *AFD* with *Van Vliet* for at least the same reasons as discussed in Section XI.B.C.1 and incorporated herein. *AFD* is in the same field of endeavor as *Van Vliet* (as well as the '805 Patent) and is directed to solving the same problem—delivering hydrocarbon fluids, specifically fuel, from a mobile trailer via hoses to multiple pieces of equipment.[309]

[307] *See supra* Section XI.D.2

[308] *See supra* Section XI.A.2.20

[309] EX1001, 1:22-35; EX1004, [0003], [0014], Abstract; EX1007, 2-3.

More specifically, both *Van Vliet* and *AFD,* as well as the '805 Patent claims, involve mobile refueling systems.[310] *AFD* is therefore analogous art to *Van Vliet* as well as the '805 Patent claims.

260. It would have been obvious to a POSITA to combine *AFD*'s control system, hose configuration, and compartment configuration with *Van Vliet*. A POSITA would recognize the benefits of the control compartment of AFD, including having the controller in the compartment with the operator. *Van Vliet* already teaches "A cabin [] for example comprising a heater, desk, and access to relevant control equipment. [] A dashboard may be visible from the cabin, the dashboard containing readouts of system characteristics such as fuel tank **12** levels." A POSITA would be motivated to combine this teaching with the teaching of AFD that the controller, and the dashboard, are in the cabin with the operator to take advantage of the ease of interaction between the operator and the dashboard that AFD provides. This would have predictably enabled *Van Vliet*'s system (as modified by *Cable*) to distribute

[310] *See* EX1001, 1:13-15 ("More preferably, to avoid shut-downs ***fuel is replenished in a hot-refueling operation while the equipment continues to run***.); *compare* EX1007 (*AFD*) ("AFD's innovative ***refueling system*** will increase worker safety by minimizing exposure time around the hot zones and high pressure lines through controlled fueling. The self-contained unit has been built to meet and exceed fire code and hazardous location standards as well as include secondary systems ***to ensure that fuelling continues uninterrupted***.").

fuel more safely and efficiently, as the operator would monitor and adjust parameters relating to fuel delivery without having to leave the cabin.

261. Further, *Van Vliet* contains an express motivation to combine. *Van Vliet* teaches a mobile trailer having first and second opposed trailer side walls.[311] The hoses of *Van Vliet* "are run out to equipment **10** through an ***opening in the trailer wall*** in whatever arrangement the well operator has requested that the fracturing equipment be placed around the well."[312] In an embodiment, *Van Vliet*'s manifolds and associated hoses are arranged such that "one manifold **36** may supply fluid to equipment **10** lined up on ***one side of a well***, while another manifold **38** may supply fluid to equipment **10** lined up on ***the other side***."[313] A POSITA would be motivated to incorporate the specific teachings of *AFD*'s hose deployment configuration (i.e. through both a first and second sidewall) to help meet the goal of *Van Vliet* of serving equipment on one side of the well from one manifold and equipment on the other side of the well from a separate manifold. This would have predictably enabled *Van Vliet*'s system to distribute fuel more safely and efficiently by reducing the hoses to be extended a minimal length, as well as reducing crossing and clutter of hoses at the wellsite.

[311] EX1004, [0014], [0024], and [0026].

[312] EX1004, [0024].

[313] EX1004, [0024].

262. *Van Vliet* and *AFD* describe similar systems used for the same purpose and would have provided a POSITA with complementary teachings and implementation details. Both references include (1) a mobile trailer;[314] (2) a storage tank on the mobile trailer;[315] (3) reels on the mobile trailer;[316] (4) hoses on the reels;[317] (5) a pump on the mobile trailer coupled to the storage tank;[318] and (6) valves for controlling the flow of a fluid.[319]

263. A POSITA would have been motivated to modify *Van Vliet* (as modified by *Cable*) to include *AFD*'s control system, for example, to achieve efficient control of the mobile fuel delivery system's hoses. *Van Vliet* discloses a control station[320], a control cabin,[321] and fuel level sensors associated with hoses,[322] but does not disclose all the functionality of those systems. *AFD*'s control system is used in the context of a similar refueling system, and *AFD* describes the functionality of AFD's "Intuitive Control Panel" useful to "control and provide fuel status for

[314] EX1004, FIG. 5; EX1007, 2.
[315] EX1004, [0003], [0014]; EX1007, 2.
[316] EX1004, [0015]; EX1007, 2.
[317] EX1004, [0015]; EX1007, 3.
[318] EX1004, [0014]; EX1007, 2.
[319] EX1004, [0003], [0014]; EX1007, 3 (providing for control of each reel).
[320] EX1004, Abstract & [0018].
[321] EX1004, [0031].
[322] EX1004, FIG. 2.

each reel and the main tank."[323] A POSITA would find desirable to use in the *Van Vliet* control system to efficiently control fuel delivery to through the various reels to the equipment tanks, and to monitor the main fuel tank. Furthermore, *Van Vliet* discusses the importance of addressing fire hazards,[324] and *AFD* expressly states the AFD system "has been built to meet and exceed fire code and hazardous location standards" for that purpose.[325] A POSITA would have recognized the advantage of augmenting *Van Vliet*'s control systems with *AFD*'s control system architecture and fire safety precautions.

264. A POSITA would further have been motivated to modify *Van Vliet* to include *AFD*'s reel and hose configuration to enable *Van Vliet*'s system to more efficiently and safely fuel satellite tanks located on either side of a mobile trailer. This would allow an operator to access reels more efficiently for maintenance and increases the number of reels practicably deployable from the trailer.

265. A POSITA would have had a reasonable expectation of success in combining *AFD* with *Van Vliet*. *AFD* and *Van Vliet* are highly similar, and the aspects of *AFD* added to *Van Vliet* in the proposed combination (control system architecture and the arrangement of reels/hoses) merely modify existing elements in

[323] EX1007, 2.

[324] See, for example, EX1004, Abstract & [0002].

[325] EX1004, [0002].

conventional ways. Incorporating *AFD*'s control system architecture and the arrangement of hoses into *Van Vliet*'s mobile fuel delivery system would merely involve combining prior art elements according to known methods to yield predictable results.

### 2. Claim 1

266. For the reasons discussed in the sections below, the combination of *Van Vliet* and *AFD* renders obvious Claim 1.

#### a. Claim 1[p]: "A distribution station comprising:"

267. To the extent the preamble is limiting, as explained with respect to Ground 1 above, and incorporated herein by reference, *Van Vliet* discloses "[a] distribution station."[326] To the extent the board determines that *Van Vliet* does not disclose a distribution station, *AFD* also discloses a distribution station: "AFD's innovative refueling system will increase worker safety by minimizing exposure time around the hot zones and high pressure lines through controlled fueling. The self-contained unit has been built to meet and exceed fire code and hazardous location standards as well as include secondary systems to ensure that fueling continues uninterrupted."[327] A POSITA would have understood that *AFD* is referring to a fuel distribution station involving "controlled fueling" and uninterrupted

[326] *See supra* Section XI.A.2.Claim 1[p].

[327] EX1007.

fueling. Accordingly, to the extent the preamble is limiting, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[p] obvious.

**b. Claim 1[a]: "a mobile trailer"**

268. As explained with respect to Ground 1 above, and incorporated herein by reference, *Van Vliet* discloses "a mobile trailer."[328] To the extent the board determines that *Van Vliet* does not disclose a mobile trailer, *AFD* also discloses a mobile trailer, as shown in the figure below, excerpted from *AFD*.[329]


269. Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[a] obvious.

**c. Claim 1[b]: "a pump on the mobile trailer"**

270. As explained with respect to Ground 1 above, in Section XI.A.2.c and incorporated herein by reference, *Van Vliet* discloses "a pump on the mobile trailer." *AFD* also discloses a pump on the mobile trailer. *AFD* discloses a "10,000 L fuel

[328] *See supra* Section XI.A.2.b.

[329] EX1007.

tank [which] allows for seamless mobilization and demobilization as well as reducing start times. The main fuel tank has an internal pump to attach to an alternative fuel source in addition to connections to the 24 fuel reels."[330] Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[b] obvious.

**d. Claim 1[c]: "first and second manifolds on the mobile trailer and fluidly connected with the pump,"**

271. As explained with respect to Ground 1 above, Section XI.A.2.d and incorporated herein by reference, *Van Vliet* discloses "first and second manifolds on the mobile trailer and fluidly connected with the pump." Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[c] obvious.

**e. Claim 1[d]: "a plurality of reels on the mobile trailer,"**

272. As explained with respect to Ground 1 above in Section XI.A.2.e, and incorporated herein by reference, *Van Vliet* discloses "a plurality of reels on the mobile trailer." To the extent the board determines that *Van Vliet* does not disclose a plurality of reels on the mobile trailer, *AFD* also discloses a plurality of reels on the mobile trailer. *AFD* teaches "The main body of the trailer contains 24 fuel reels,

[330] EX1007.

each with 300 – 450' of 1" hose allowing for greater flexibility in tight locations.[331] Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[d] obvious.

**f. Claim 1[e]: "a plurality of hoses connected, respectively, with the reels,"**

273. As explained with respect to Ground 1 above in Section XI.A.2.f, and incorporated herein by reference, *Van Vliet* discloses "a plurality of hoses connected, respectively, with the reels, wherein a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold." To the extent the board determines that *Van Vliet* does not disclose a plurality of hoses connected, respectively, with the reels, *AFD* also discloses a plurality of hoses connected, respectively, with the reels. *AFD* teaches "The main body of the trailer contains 24 fuel reels, each with 300 – 450' of 1" hose allowing for greater flexibility in tight locations."[332] Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[e] obvious.

[331] EX1007, 1

[332] EX1007.

**g. Claim 1[f]: "a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses"**

274. As explained with respect to Ground 1 above in Section XI.A.2.g, and incorporated herein by reference, *Van Vliet* discloses "a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses." Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[f] obvious.

**h. Claim 1[g]: "a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses"**

275. As explained with respect to Ground 1 above in Section XI.A.2.h, and incorporated herein by reference, *Van Vliet* discloses "a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses." *AFD* also discloses a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses. *AFD* teaches "***Each hose includes sensors and transmitters that generate real time data*** to the control room … The Control Room contains two touch screen display monitors that control and ***provide fuel status for each reel*** and the main tank. The color coded monitoring system allows for ***easy recognition of each individual reel***, as well as a

visual of all 24 reels at one time.[333] Based on the teaching of *Van Vliet* which includes "fuel level sensors **54**," it would have been obvious to a POSITA that the "fuel status" displayed on the control room touch screen would include "fluid level sensors" in the combination. Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[g] obvious.

**i. Claim 1[h]: "wherein the reels are arranged on first and second opposed sides in the mobile trailer, with an aisle walkway down the middle of the mobile trailer"**

276. *AFD* discloses or at least renders obvious "wherein the reels are arranged on first and second opposed sides in the mobile trailer, with an aisle walkway down the middle of the mobile trailer."

277. For example, *AFD* describes "[t]he main body of the trailer contains 24 fuel reels, each with 300 – 450' of 1" hose …."[334] *AFD* includes an image of its "AFD Onsite Refueling System" showing hoses coming out of ***both*** sides of the main body of the trailer:[335]

[333] EX1007.

[334] EX1007.

[335] EX1007 (excerpted and annotated) (showing hoses coming from the far side of the main body, visible underneath main body); *Id.* (excerpted and annotated) (showing hoses coming from the near side of the main body).



278. In the second image, with blue annotation, 12 hoses are deployed on the near side. As discussed above, *AFD* discloses 24 houses, thus a POSITA would have understood that the remaining 12 hoses are deployed on the far side of the trailer. Because *AFD* describes a hose associated with ***each*** reel, a POSITA would have recognized that 12 reels are arranged along the near wall of the main body of the trailer and 12 reels are arranged along the far wall of the main body of the trailer (as oriented according in the annotated images above). A POSITA would have

recognized that the reels would not be arranged along only one wall at least because this would result in a tripping hazard that would obstruct the exit route. [336]

279. Second *AFD* further teaches or suggests "an aisle walkway down the middle of the mobile trailer." For example, considering the arrangement discussed above, a POSITA would have understood that the system shown in *AFD* must be arranged to have an aisle walkway between the reels for maintenance (*e.g.*, replacing reels, attaching hoses, operating the reels to retract hoses, etc.) and safety (*e.g.*, to provide access to manual shut-off valves). *AFD* includes further disclosure confirming this arrangement. For example, *AFD* includes a set of stairs for access to the main body of the mobile trailer:[337]

[336] A POSITA would have recognized that the reels would not be arranged along one wall at least because this would result in a tripping hazard that would obstruct the exit route. *See* EX1031, OSHA Exit Route Standard ("1910.36(g)(4) Objects that project into the exit route must not reduce the width of the exit route to less than the minimum width requirements for exit routes.").

[337] EX1007 (excerpted and annotated).


*AFD* also shows a flap that has been partially removed to allow access to the main body of the trailer:[338]


Based on the images above, A POSITA would have understood *AFD* to teach or at least suggest an aisle walkway down the middle of the mobile trailer.

280. Alternatively, to the extent that *AFD* does not disclose "an aisle walkway down the middle of the mobile trailer," it is an implementation detail that would have been obvious to incorporate in that system, as combined with *Van Vliet*.

[338] EX1007 (excerpted and annotated).

For example, *Van Vliet* explains its hoses have "manually operated valves" capable of providing "emergency shut down."[339]. These valves **28** are illustrated in *Van Vliet*'s system upstream of the reels **30**, as shown in FIG. 1 below: [340]

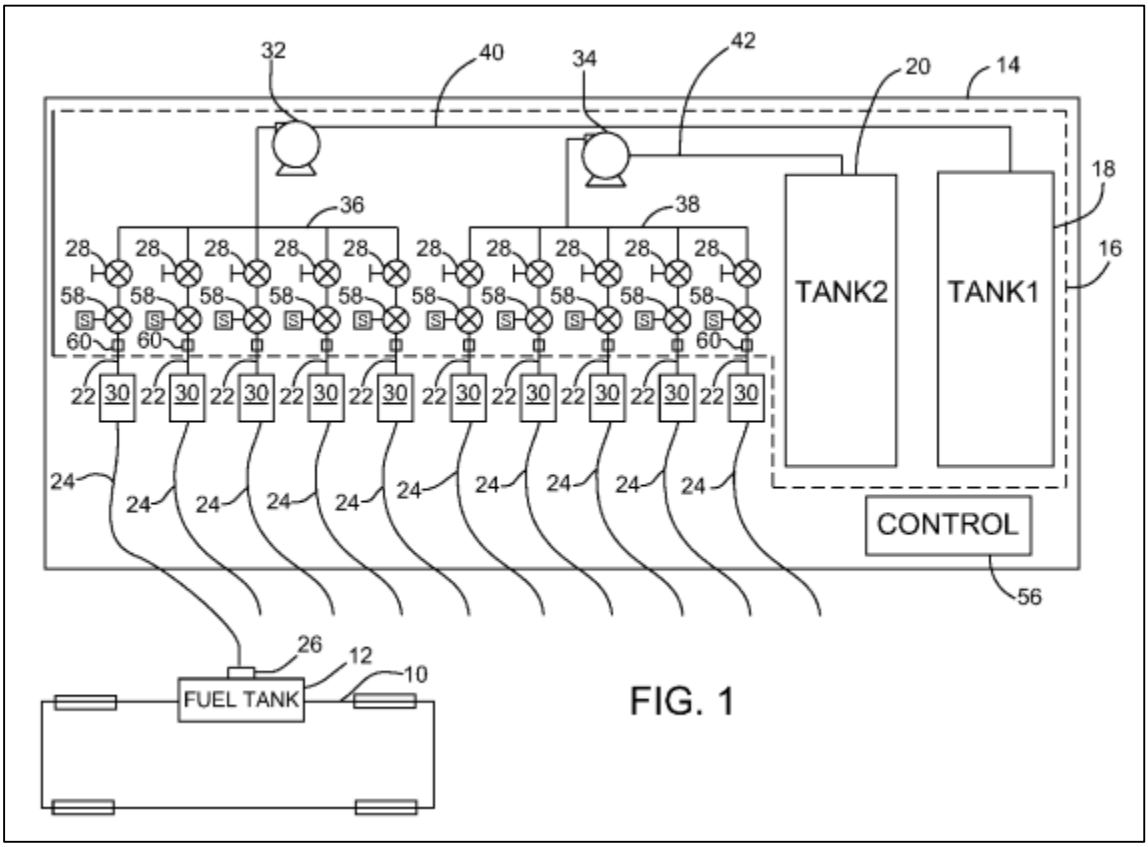



FIG. 1

*Van Vliet* further teaches "[t]he manual valves **28** should be readily accessible to an operator on the trailer **14**. This can be arranged with the manifolds **36**, **38** mounted on a wall of the trailer with the outlets **22** extending inward of the trailer wall."[341]

[339] *See* EX1004, [0016], [0023].

[340] EX1004, FIG. 1; *see also id.*, [0016] ("The manually controlled valves 28 are preferably located on and formed as part of the manifolds 36, 38.").

[341] EX1004, [0026]

With reels and hoses arranged on opposed side walls as taught by *AFD*, the outlets extending inward of the trailer wall, and valves "readily accessible" to an operator, it would have been obvious to include an aisle walkway down the middle of the trailer at least to provide access to these manually controlled valves. Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 1[h] obvious.

**3. Claim 7: "The distribution station as recited in claim 1, wherein the mobile trailer includes trailer end wall that has an outside door, an inside wall that defines first and second compartments in the mobile trailer, the outside door opening into the first compartment, and at least the manifolds and the reels are in the first compartment."**

281. *AFD* discloses or renders obvious "wherein the mobile trailer includes trailer end wall that has an outside door, an inside wall that defines first and second compartments in the mobile trailer, the outside door opening into the first compartment, and at least the manifolds and the reels are in the first compartment." For example, *AFD* describes that "[t]he main body of the trailer contains 24 fuel reels, each with 300 - 450' of 1" hose allowing for greater flexibility in tight locations," (shown below highlighted blue) and "[t]he Control Room contains two touch screen display monitors that control and provide fuel status for each reel and the main tank" (shown below highlighted red). The main body maps to first compartment and the control room maps to the second compartment. As discussed above, *AFD* further discloses a removable flap at one end of the main body providing

access to the main body.[342] This removable flap maps to the outside door in the end wall and would be in the region shown below highlighted yellow.[343] To the extent Patent Owner argues that a removable flap is not a "door", it would have been obvious to a POSITA that a removable flap could be replaced with a hinged door as simple design choice, *e.g.*, to provide a more substantial or secure barrier for accessing the interior of the main body.


282. Accordingly, *AFD* discloses the limitations in Claim 7, and the combination of *AFD* and *Van Vliet* renders obvious Claim 7.

[342] *See supra* Section XI.E.2.i

[343] EX1007, (excerpted and annotated).

**4. Claim 8: "The distribution station as recited in claim 7, wherein the inside wall includes an inside door providing access between the first compartment and the second compartment, the aisle walkway extending from the outside door to the inside door"**

283. *AFD* renders obvious that "the inside wall includes an inside door providing access between the first compartment and the second compartment, the aisle walkway extending from the outside door to the inside door." For example, it would have been obvious that the second compartment discussed above with respect to Claim 7 includes a door (mapping to the claimed "inside door" for access to the control room (*i.e.*, the claimed second compartment).[344] In fact, such a door would be necessary in order to reduce the area classification of the control room from Class I Div. 2 to unclassified, and allow the use of potential ignition sources such as heaters or electrical/electronic equipment not identified for use in classified areas.[345] *AFD* further discloses or at least suggests that the aisle walkway provides access to this door because there is no other ingress/egress shown. No ladder, stair or other access point is shown in the figure allowing access to the second compartment, except for the identified ladder which would provide access to both the control compartment and the main compartment.[346]

[344] *See supra* Section XI.E.4.

[345] See Section VIII.F.

[346] EX1007 (excerpted and annotated).


284. In other words, the aisle walkway allowing for maintenance to be conducted in the main body of the trailer is shown or at least suggested to be connected to the entrance to the control room (*i.e.*, the claimed second compartment) because there is not a separate ingress/egress point depicted. Accordingly, *AFD* discloses the limitations in Claim 8, and the combination of *AFD* and *Van Vliet* renders obvious Claim 8.

**5. Claim 9: "The distribution station as recited in claim 7, a controller in the second compartment, the controller configured to operate the valves."**

285. As discussed above in Section XI.A.2.10, *Van Vliet* discloses "a controller in the second compartment, the controller configured to operate the valves." To the extent the board determines that *Van Vliet* does not disclose the limitation, *AFD* discloses "a controller in the second compartment, the controller configured to operate the valves." For example, *AFD* describes a control room: "The Control Room contains two touch screen display monitors that ***control*** and provide

fuel status for each reel and the main tank. The color coded monitoring system allows for easy recognition of each individual reel, as well as a visual of all 24 reels at one time."[347] The control room of AFD is depicted below:[348]


286. A POSITA would have understood that this compartment is the control room at least because a POSITA would recognize the necessity of separating the control room from the main compartment in order to reduce the area classification of the control room from Class I Div. 2 to unclassified, and to allow the use of

[347] EX1007.

[348] EX1007 (excerpted and annotated).

potential ignition sources such as heaters or electrical/electronic equipment not identified for use in classified areas.[349] *AFD* also includes a picture of the inside of the control room that includes the touch screen monitors.[350]

287. A POSITA would have understood that a controller in the control room would control valves which in turn control the flow of fuel in the system described in *AFD*. *AFD* discloses the two touch screen monitors "control and provide fuel status for each reel and the main tank." A POSITA would have understood and be reinforced in this understanding by the teaching of *Van Vliet*, that control of the reels involves control of valves which open or close to allow or to stop fuel flow. Alternatively, to the extent that *AFD* does not expressly disclose that the controller

[349] See Section VIII.F.

[350] EX1007 (showing inside of control room).

controls the claimed valves, a POSITA would find it obvious to use the control room described in *AFD* to control the valves **28** and **58** as described in *Van Vliet* at least to provide a centralized location for controlling and monitoring the combined system, and to allow the operator to perform a manual override of *Van Vliet's* electrically operated valve **58** from the relative safety and comfort of the control compartment rather than needing to go into the main compartment to effect an override. Accordingly, along with the disclosure of *Van Vliet, AFD* teaches or at least suggests, the claim limitation in Claim 9 and the combination of *AFD* and *Van Vliet* render obvious Claim 9.

**6. Claim 10: "The distribution station as recited in claim 9, wherein the second compartment is insulated with a fire resistant or retardant material"**

288. As discussed with respect to Ground 1 in Section XI.A.11, and incorporated herein, *Van Vliet ,* along with the knowledge of a POSITA regarding industry Codes, Standards and Regulations, discloses this limitation or at least renders it obvious. To the extent the board determines that *Van Vliet* does not disclose this limitation , *AFD* teaches a distribution station "wherein the second compartment is insulated with a fire resistant or retardant material." The self-contained unit of *AFD* (including the second compartment control room) "has been

built to meet and exceed ***fire code and hazardous location standards***."[351] A POSITA, based on the teaching of AFD and a POSITA's knowledge, would look to fire code and hazardous location standards, such as NEC-2014, IFC-2015, API 500 and NFPA 497. These standards would teach the placement of walls and other protections to protect a control compartment, such as the one depicted in AFD, and described in *Van Vliet*. Additionally, a POSITA would be informed by this statement to reference motor vehicle fire standards such as MVSS-302 (TP-302-3). As discussed in Section VIII.G, according to this US DOT standard, fire retardant materials, including insulating materials, must be used in occupant compartments, such as the one depicted in AFD and described in *Van Vliet.* Accordingly, Claim 10 is rendered obvious by *Van Vliet* in view of *AFD* along with the knowledge of a POSITA regarding industry Codes, Standards and Regulations.

**7. Claim 13: "The distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the mobile trailer has a trailer width, and a ratio of the trailer width to the aisle width is no greater than 5"**

289. *Van Vliet* in combination with *AFD* render obvious "wherein the aisle walkway has an aisle width and the mobile trailer has a trailer width, and a ratio of the trailer width to the aisle width is no greater than 5." As explained with respect to Claim 5 above, a trailer can have a maximum width of 96 inches. Also, as explained

[351] EX1007.

with respect to Claim 4 in Ground 5 below, OSHA require a minimum exit route width of 28 inches. It would have been obvious to a POSITA implementing *Van Vliet*'s system as modified by *AFD* to use a trailer width which allows for universal access to oil and gas fracturing locations, including those on State and County maintained roads (96"), and to comply with the OSHA regulations (aisle width of 28"). Accordingly, it would have been obvious to a POSITA to implement a ratio between the trailer width and aisle width of 3.43, which is less than five, and falls inside the range recited in claim 13.

$$\frac{96"}{28"} = 3.43$$

290. Therefore, the combination of *Van Vliet* and *AFD* along with a POSITA's knowledge of industry Codes, Standards and Regulations, renders this claim obvious.

**8. Claim 14: "The distribution station as recited in claim 13, wherein the ratio of the trailer width to the aisle width is greater than 2"**

291. As explained with respect to Claim 13 above in Section XI.E.8., and incorporated herein by reference, it would have been obvious to a POSITA implementing *Van Vliet*'s system as modified by *AFD* to use a trailer width which allows for universal access to oil and gas fracturing locations, including those on

State and County maintained roads (96"), and to comply with the OSHA regulations (aisle width of 28"). Accordingly, it would have been obvious to a POSITA to implement a ratio between the trailer width and aisle width of 3.43, which is greater than 2, and falls inside the range recited in claim 14. Accordingly, *Van Vliet* in combination with *AFD* along with a POSITA's knowledge of industry Codes, Standards and Regulations, render obvious "wherein the ratio of the trailer width to the aisle width is greater than 2."

**9. Claim 15: "The distribution station as recited in claim 1, wherein the ratio of the trailer width to the aisle width is equal to or less than 4"**

292. As explained with respect to Claim 13 above in Section XI.E.8., and incorporated herein by reference, it would have been obvious to a POSITA implementing *Van Vliet*'s system as modified by *AFD* to use a trailer width which allows for universal access to oil and gas fracturing locations, including those on State and County maintained roads (96"), and to comply with the OSHA regulations (aisle width of 28"). Accordingly, it would have been obvious to a POSITA to implement a ratio between the trailer width and aisle width of 3.43, which is less than 4, and falls inside the range recited in claim 15. Accordingly, *Van Vliet* in combination with *AFD* render obvious "wherein the ratio of the trailer width to the aisle width is equal to or less than 4."

**10. Claim 16: "The distribution station as recited in claim 1, further comprising a floor pan in the mobile trailer."**

293. As explained with respect to Ground 1 above in Section XI.A.17, and incorporated herein by reference, *Van Vliet* discloses "a floor pan in the mobile trailer." Further, industry codes and standards, including IFC-2015, require secondary containment and spill protection in locations that handle flammable and combustible liquids.[352] A POSITA would recognize the necessity of providing secondary containment and spill protection, such as a floor plan, in the system of *Van Vliet* and *AFD* to comply with industry codes and standards. Accordingly, a POSITA would have understood that the limitations of claim 16 are rendered obvious by *Van Vliet* in view of *AFD*.

**11. Claim 17**

294. As explained in the sections below, Claim 17 is rendered obvious by *Van Vliet* in view of *AFD*.

**a. <u>Claim 17[p]: "17. A distribution station comprising:</u>**

295. The preamble is identical to the preamble of Claim 1 and is disclosed by *Van Vliet* and *AFD* for the same reasons as those set forth in Section XI.A.2.a and XI.E.2.a above and incorporated herein. Accordingly, the preamble is disclosed

[352] *See supra.* Section VII.F.

and rendered obvious, by both *Van Vliet* and *AFD*, and the combination of the two references.

**b. Claim 17[a]: "a mobile trailer,"**

296. Claim 17[a] is identical to Claim 1[a] and is disclosed by *Van Vliet* and *AFD* for the same reasons as those set forth in Section XI.A.2.b and XI.E.2.b above and incorporated herein. Accordingly Claim 17[a] is disclosed and rendered obvious, by both *Van Vliet* and *AFD*, and the combination of the two references.

**c. Claim 17[b]: "a pump on the mobile trailer,"**

297. Claim 17[b] is identical to Claim 1[b] and is disclosed by *Van Vliet* and *AFD* for the same reasons as those set forth in Section XI.A.2.c and XI.E.2.c above and incorporated herein. Accordingly Claim 17[b] is disclosed and rendered obvious, by both *Van Vliet* and *AFD*, and the combination of the two references.

**d. Claim 17[c]: "first and second manifolds on the mobile trailer and fluidly connected with the pump,"**

298. Claim 17[c] is identical to Claim 1[c] and is disclosed by *Van Vliet* for the same reasons as those set forth in Section XI.A.2.d above and incorporated herein. Accordingly Claim 17[c] is disclosed by *Van Vliet* and rendered obvious by the combination of the two references.

**e. Claim 17[d]: "a plurality of reels on the mobile trailer,"**

299. Claim 17[d] is identical to Claim 1[d] and is disclosed by *Van Vliet* and *AFD* for the same reasons as those set forth in Section XI.A.2.e and XI.E.2.e above and incorporated herein. Accordingly Claim 17[d] is disclosed and rendered obvious, by both *Van Vliet* and *AFD,* and the combination of the two references.

**f. Claim 17[e]: "a plurality of hoses connected, respectively, with the reels, wherein a portion of the reels are connected with the first manifold and another portion of the reels are connected with the second manifold;"**

300. Claim 17[e] is like Claim 1[e], with the addition of a specific configuration of manifolds and reels. *Van Vliet* and *AFD* disclose this limitation as described in Section XI.A.2.f and XI.E.2.f respectively and incorporated herein. Accordingly Claim 17[e] is disclosed by *Van Vliet* and rendered obvious by the combination of the two references.

**g. Claim 17[f]: "a plurality of valves on the mobile trailer, each of the valves situated between one of the first or second manifolds and a respective different one of the hoses;"**

301. Claim 17[f] is identical to Claim 1[f] and is disclosed by *Van Vliet* and *AFD* for the same reasons as those set forth in Section XI.A.2.g and XI.E.2.g above and incorporated herein. Accordingly Claim 17[f] is disclosed and rendered obvious, by both *Van Vliet* and *AFD,* and the combination of the two references.

**h. Claim 17[g]: "a plurality of fluid level sensors, each of the fluid level sensors being associated a respective different one of the hoses;"**

302. Claim 17[g] is identical to Claim 1[g] and is disclosed by *Van Vliet* and *AFD* for the same reasons as those set forth in Section XI.A.2.h and XI.E.2.h above and incorporated herein. Accordingly Claim 17[g] is disclosed and rendered obvious, by both *Van Vliet* and *AFD,* and the combination of the two references.

**i. Claim 17[h]: "wherein the mobile trailer includes first and second opposed trailer side walls, and a first group of the hoses are deployable from the first trailer side wall and a second group of the hoses are deployable from the second trailer side wall."**

303. As discussed above with respect to ground 1 in Section XI.A.18.i, *Van Vliet* discloses, or at least renders obvious this claim limitation. To the extent the board determines *Van Vliet* does not teach this limitation, *AFD* discloses or renders obvious "wherein the mobile trailer includes first and second opposed trailer side walls, and a first group of the hoses are deployable from the first trailer side wall and a second group of the hoses are deployable from the second trailer side wall." For example, *AFD* describes "[t]he main body of the trailer contains 24 fuel reels, each with 300 – 450' of 1" hose …."[353] *AFD* includes an image of its "AFD Onsite

[353] EX1007.

Refueling System" showing hoses coming out of the side walls on both sides of the main body of the trailer:[354]



In the second image, 12 hoses are deployed on the near side. *See id*. *AFD* describes that there are 24 hoses in total: "The main body of the trailer contains 24 fuel reels, each with 300 – 450' of 1" hose …."[355], thus a POSITA would have understood

[354] EX1007 (excerpted and annotated to show hoses coming from the far side of the main body, visible underneath main body); *Id.*, (excerpted and annotated to show hoses coming from the near side of the main body).

[355] EX1007.

that the remaining 12 hoses are deployed on the far side of the trailer. Accordingly Claim 17[h] is disclosed and rendered obvious, by both *Van Vliet* and *AFD*, and the combination of the two references.

**12. Claim 18: "The distribution station as recited in Claim 17, wherein the reels are arranged on first and second opposed sides in the mobile trailer such that there is an aisle walkway down the middle of the mobile trailer"**

304. Claim 18 is identical to Claim 1[h] and is disclosed by *Van Vliet* and *AFD* for the same reasons as those set forth in Section XI.A.2.i and XI.E.2.i above and incorporated herein. Accordingly Claim 17[h] is disclosed and rendered obvious, by both *Van Vliet* and *AFD*, and the combination of the two references.

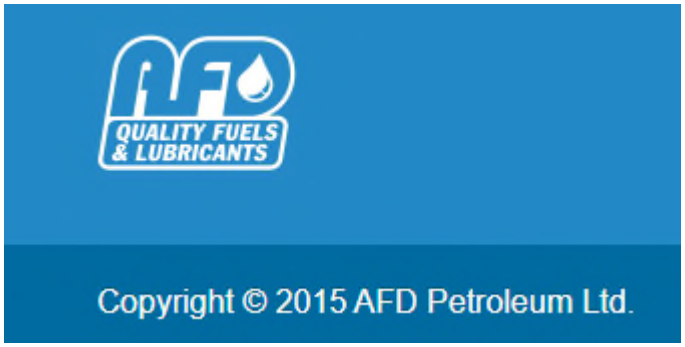
**13. Claim 22: "The distribution station as recited in claim 17, further comprising a floor pan in the mobile trailer."**

305. Claim 22 is essentially identical to Claim 5 (other than the references to different claim numbers) and is disclosed by *Van Vliet* and *AFD* for the same reasons as those set forth in Section XI.A.6and XI.E.3 above and incorporated herein. Accordingly Claim 22 is disclosed and rendered obvious, by both *Van Vliet* and *AFD*, and the combination of the two references.

### F. Ground 6: Claims 2-3, 6, and 19 are rendered obvious by *Van Vliet* in view of *AFD*, and *Lowrie*

#### 1. Rationale and motivation for combining *Van Vliet* with *AFD* and *Lowrie*

306. A POSITA would have been motivated to combine *Lowrie* with *Van Vliet* (as modified by *AFD*). *Lowrie* is in the same field of endeavor as *Van Vliet*, *AFD*, and the '805 Patent and is directed to solving the same problem—distribution of hydrocarbon liquids. More specifically, both *Van Vliet* and *AFD* involve mobile refueling systems. *AFD* is therefore analogous art to both *Van Vliet* and *Cable*, as well as the '805 Patent claims.[356] Specifically with respect to *AFD*, *Lowrie* is assigned to AFD Petroleum Ltd., who published and owned the copyright on *AFD*, ostensibly using *AFD* to market the system, or at least a system very similar to the one, described in *Lowrie*:[357]




[356] EX1001, 1:22-35; EX1004, [0003], [0014], Abstract; EX1007, 2-3; EX1006, [0002], [0004], [0005], [0032], Abstract.

[357] EX1007 (excerpted).

307. It would have been obvious to a POSITA to use *Lowrie*'s reel organization and storage with the system described in *AFD* (as combined with *Van Vliet*). *Van Vliet* discloses that the spatial orientation of the reels **30**, manifolds **36** and **38**, tanks **18** and **20**, and other equipment shown "is a matter of design choice for the manufacturer and will depend on space requirements."[358] A POSITA would then look to other references, such as *Lowrie* for spatial configurations that allow for efficient storage and deployment of hoses and reels. This would have predictably enabled *Van Vliet*'s system to distribute fuel more safely and efficiently.

308. Like *AFD*, *Lowrie* describes a similar system to *Van Vliet* and would have provided a POSITA with complementary teachings and implementation details. *Id.* Both include (1) a storage tank;[359] (2) reels,[360] (3) hoses on the reels,[361] (4) a pump coupled to the storage tank,[362] and (5) valves for controlling flow.[363]

309. A POSITA would have been motivated to further modify *Van Vliet* (as modified by *AFD*) to include *Lowrie*'s reel organization and storage to store hoses more efficiently. A POSITA would recognize that stacking the reels, as disclosed by

[358] EX1004, [0027].

[359] EX1004, [0003]; EX1006, [0033], EX1013, 5:9-14)

[360] EX1004, [0014]; EX1006, FIG. 1; EX1013, FIG. 1

[361] EX1004, [0014], [0015; EX1006, [0037]; EX1013, 6:13-16

[362] EX1004, [0014]; EX1006, [0036]; EX1013, 6:9-12

[363] EX1004, [0003]; EX1006, [0007], [0044]; EX1013, 2:6-9, 8:6-14

Lowrie, would provide more efficient use of space than an arrangement where reels are not stacked. A POSITA would recognize that the diameter of a reels is much less than the height of a trailer such as the one disclosed in *Van Vliet* and a stacked arrangement, such as the one in Lowrie, takes advantage of that fact. A POSITA would have immediately recognized the advantage of augmenting *Van Vliet*'s hose and reel organization with *Lowrie*'s technique of stacking reels.

310. A POSITA would have had a reasonable expectation of success in combining *Lowrie* with *Van Vliet* (as modified by *AFD*). *Lowrie* and *Van Vliet*, along with *AFD*, are highly similar, and the aspects of *Lowrie* added to *Van Vliet* in the proposed combination (arrangement and storage of reels/hoses) merely modify existing elements in conventional ways, such as arranging the reels of *Van Vliet* to take advantage of the relative sizes of the reels and trailer, allowing the reels and hoses to be stored more efficiently. Incorporating *Lowrie'*s reel and hose organization and storage into *Van Vliet*'s mobile fuel delivery system (as modified by *AFD*) would merely involve combining prior art elements according to known methods to yield predictable results.

**2. Claim 2: "The distribution station as recited in claim 1, wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels"**

311. The disclosure of Claim 1, from which Claim 2 depends, is the same as discussed with respect to Ground 5, Section XI.E.2 and is incorporated herein by reference.

312. *Lowrie* discloses "wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels." For example, Figure 1 of *Lowrie* illustrates the claimed arrangement in a "mobile tanker" (ref. num. 100):[364]

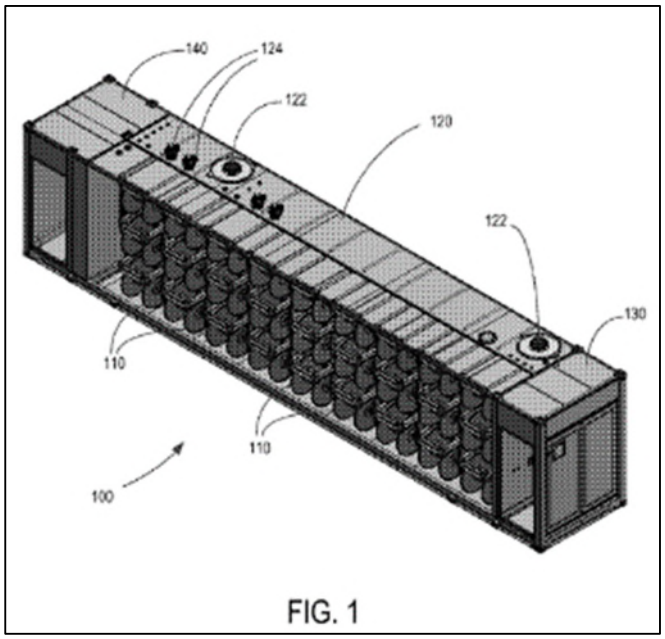


FIG. 1

[364] *See* EX1006, [0033] ("the system comprises a mobile tanker 100…."; EX1013, 5:10-12; EX1006, FIG. 1; EX1013, FIG. 1 & 5:9-14.

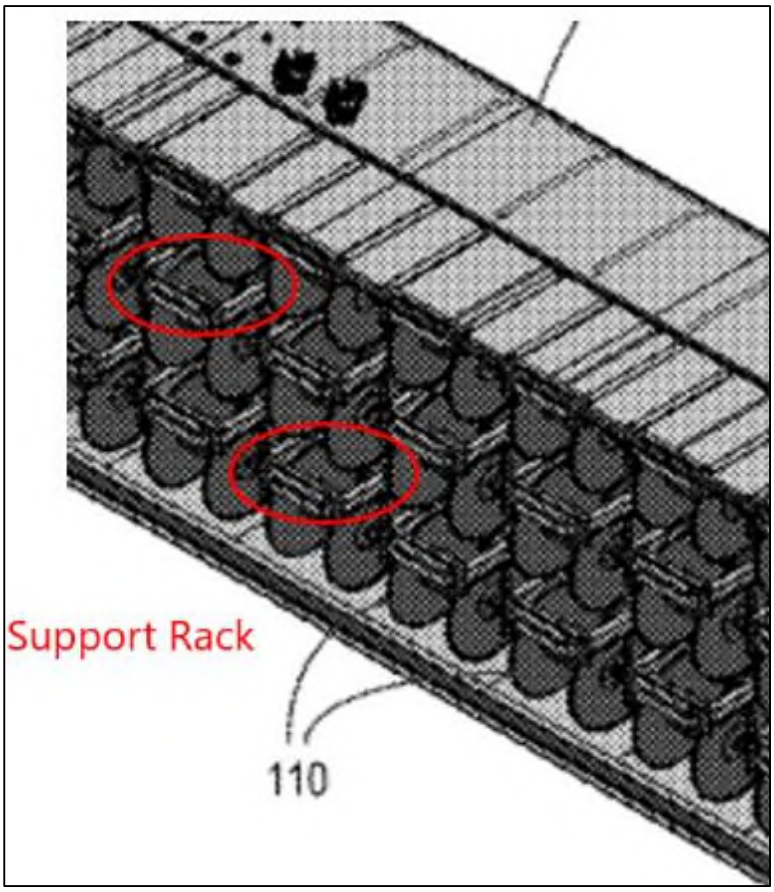
313. As depicted above, *Lowrie* teaches multiple rows of reels with hoses 110. Lowrie further discloses "[e]ach refueling hose 110 may be wound on a reel for storage, and pulled out for dispensing fuel to a receiving fuel tank at a work site 380."[365] A POSITA would have understood that *Lowrie*'s teaching of multiple rows of reels, resulting in at least an upper and lower row of reels, combined with *AFD*'s teaching of reels and hoses arranged on opposing sides of a trailer, teaches the limitation of Claim 2 as claimed. Accordingly, the combination of *Van Vliet, AFD* and *Lowrie* renders obvious Claim 2.

**3. Claim 3: "The distribution station as recited in claim 2, further comprising first and second support racks on which the reels are supported, the first support rack arranged on the first side and the second support rack arranged on the second side"**

314. *Lowrie* discloses or at least suggests "first and second support racks on which the reels are supported, the first support rack arranged on the first side and the second support rack arranged on the second side." For example, a support rack is depicted in FIG. 1:[366]

[365] EX1006, [0037], see also EX1013, 6:13-16

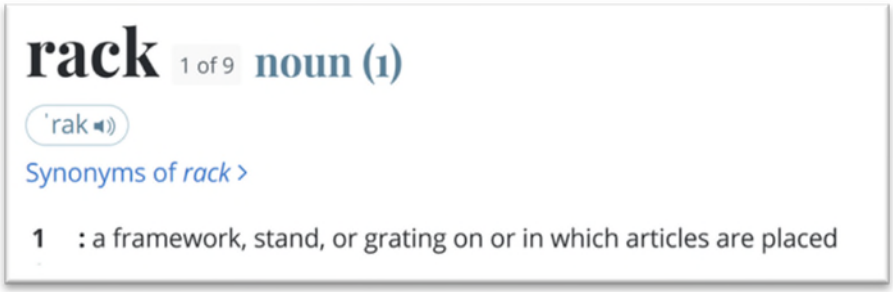
[366] EX1006, FIG. 1 (excerpted and annotated); see also EX1013, FIG. 1 (same).




315. A POSITA would have understood that *Lowrie*'s teaching of multiple rows of reels require a support structure (*i.e.*, the claimed support rack) and thus—combined with *AFD*'s teaching of reels and hoses arranged on opposing sides of a trailer—teaches the limitation of Claim 3 as claimed.

316. Alternatively, to the extent that *Lowrie* does not explicitly disclose a support rack to support its multiple rows of reels, a POSITA would have recognized that a rack is a common and well-known means by which rows of reels would be supported. For example, the Merriam Webster dictionary defines rack as a

"framework, stand, or grating on or in which articles are placed."[367] A POSITA would have recognized that a framework or stand would be an appropriate and common method of supporting the stacked reels of *Lowrie*.


rack 1 of 9 noun (1)
'rak
Synonyms of *rack* >
1 : a framework, stand, or grating on or in which articles are placed

317. To the extent that *Lowrie* does not already disclose a rack, a POSITA would have been motivated to modify the teaching of *Lowrie* to include a support rack to effectuate *Lowrie*'s teaching using multiple rows of reels. Further, a POSITA would have a reasonable expectation of success in implementing a support rack in this way because it would merely involve the use of well-known components in a conventional way. Accordingly, the combination of *Van Vliet, AFD* and *Lowrie* render obvious Claim 3.

**4. Claim 6: "The distribution station as recited in claim 2, wherein a ratio of a number of reels in the upper row to a number of reels in the lower row is 1:1"**

318. *Lowrie* discloses "wherein a ratio of a number of reels in the upper row to a number of reels in the lower row is 1:1." For example, Figure 1 of *Lowrie* shows

[367] EX1029.

an equal number of reels in the top and bottom rows (9 on the top row and 9 on the bottom row)—resulting in a 1:1 ratio:[368]

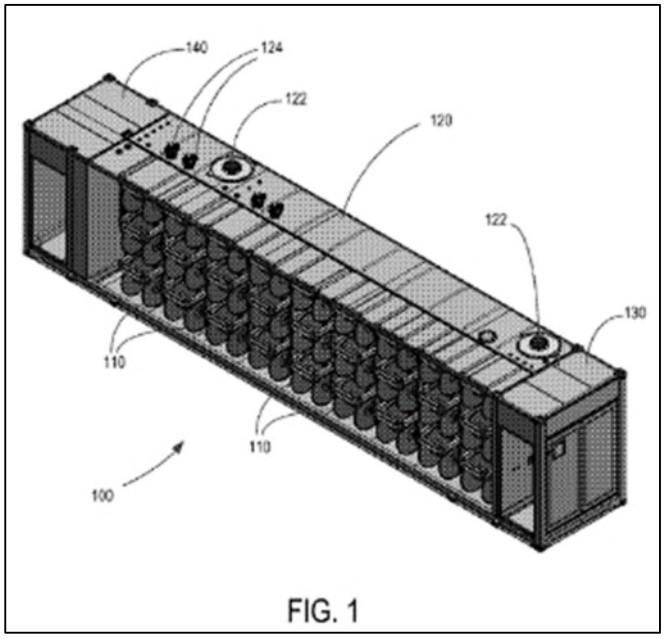


FIG. 1

Accordingly, the combination of *Van Vliet, AFD* and *Lowrie* render obvious Claim 6.

**5. Claim 19: "The distribution station as recited in Claim 18, wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels"**

319. As explained above regarding claim 3 in Section XI.F.3 and incorporated herein by reference, *Lowrie* discloses "wherein the reels on each of the first and second opposed sides are arranged in upper and lower rows of reels."

[368] EX1006, FIG. 1; EX1013, FIG. 1; *see also* EX1006 FIG. 2b.

Accordingly, the combination of *Van Vliet, AFD* and *Lowrie* render obvious Claim 19.

### G. Ground 7: Claims 4, 5, 20, and 21 are rendered obvious by *Van Vliet* in view of *AFD, Lowrie* and *Coxreels*

#### 1. Rationale and motivation for combining *Van Vliet, AFD,* and *Lowrie* with *Coxreels*

320. A POSITA would have been motivated to combine *Coxreels* with *Van Vliet*, *AFD*, and *Lowrie*. For example, *Coxreels* is in the same field of endeavor as *Van Vliet, AFD, Lowrie* and the '805 Patent and is directed to solving the same problem—distribution of hydrocarbon liquids.[369] *Coxreels* is therefore analogous art to *Van Vliet, AFD, Lowrie* and the '805 Patent claims.

321. It would have been obvious to a POSITA to combine *Coxreels*' reels with *Van Vliet* (as modified by *AFD* and *Lowrie*). A POSITA, based on the teachings of *Van Vliet* and *Cable* regarding storage of hoses on reels, would have been motivated to reference information on commercially available hose reels, such as the ones disclosed in *Coxreels* when designing the layout of the fuel distribution station. Information contained in *Coxreels*, such as dimensions and capacities of commercially available reels, would have been invaluable to the designer when

[369] EX1001, 1:22-35; EX1004, [0003], [0014], and Abstract; EX1007, 2-3; EX1006, [0002], [0004], [0005], [0032], Abstract; EX1008.

evaluating the size, layout, location, and spatial orientation of equipment on the mobile distribution station.

322. It would have been obvious to a POSITA to use the specific reel described in *Coxreels*' in the system of *Van Vliet* (as modified by *AFD* and *Lowrie*). A POSITA would have been motivated to combine *Coxreels*' reel with the system of *Van Vliet* (as modified by *AFD* and *Lowrie*). *Van Vliet* discloses the use of reels.[370] A POSITA designing a system of *Van Vliet* would have looked to commercially available reel components like those described in *Coxreels*, among other reasons, as a cost-effective and readily available option (*e.g.*, as compared to a custom-made reel) for the building of that system. At the time of the '805 Patent, Coxreels were specifically market for use in the oil industry.[371] Accordingly, a POSITA would have recognized the advantage of using *Coxreels*' reel in *Van Vliet*'s mobile fuel delivery system. This would have predictably resulted in enabling *Van Vliet*'s system to operate using a specified reel of a specified size.

323. *Coxreels* describes the "1125 Series hand crank and motorized hose reels have the features demanded by industry professionals. Coxreels describes "industry preferred design features [such as] a sturdy one piece all welded 'A' frame

[370] EX1004, [0015]

[371] *See* EX1030, 5-6 (showing the 1125 series reels as an option on the "Petroleum" page).

base, low profile outlet riser and open drum slot design provides a non-crimping, flat smooth hose wrap."[372] A POSITA would have recognized the advantage of using *Coxreels*' reels with *Van Vliet*'s system (as modified by *AFD* and *Lowrie*).

324. A POSITA would have had a reasonable expectation of success in combining *Coxreels* with *Van Vliet* (as modified by *AFD* and *Lowrie*). To combine *Van Vliet* with *Coxreels*, a POSITA would have needed only to select *Coxreels*' reel when choosing which reel to implement. Incorporating *Coxreels*' reel into *Van Vliet*'s mobile fuel delivery system (as modified by *AFD* and *Lowrie*) would merely involve combining a known prior art reel according to known methods, installing and using the reel in a conventional way. Therefore, a POSITA would have expected that the *Coxreels* reel would work successfully and according to its known functionality in this combination.

**2. Claim 4: "The distribution station as recited in claim 3, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3."**

325. *Coxreels*, when combined with *Van Vliet*, *AFD*, and *Lowrie*, discloses or suggests "wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3." For example, as discussed above with respect to Ground 5 in Section XI.E.2.i,

[372] EX1008.

and incorporated herein, *AFD* discloses a trailer with an aisle walkway down the middle to allow access to reels (to operate manual shut-off valves among other reasons). Because a human operates the manual shut-off valves in the combined system as taught by *Van Vliet*, OSHA Occupational Safety and Health Standards ("OSHS") require an exit path that is at least 28 inches wide at all points. OSHA regulations, contained in 49 CFR §1910.36(g)(2) require "[a]n exit access must be at least 28 inches (71.1 cm) wide at all points.[373] Where there is only one exit access leading to an exit or exit discharge, the width of the exit and exit discharge must be at least equal to the width of the exit access."[374] *Coxreels* teaches a reel with a 17 and 5/8" diameter.[375] Thus, the *Van Vliet-AFD* system using *Coxreels*' 1125 Series reel described in EX1008 would have a ratio between the walkway and the reel diameter of 1.588, which falls within the claimed range.

$$\frac{28"}{17.625"} = 1.588$$

[373] EX1031.

[374] *See also* EX1007 ("The self-contained unit has ***been built to meet and exceed fire code and hazardous location standards*** ….").

[375] *See* EX1008. Notably, for the model of reel shown in EX1008, the diameter of the reel stays constant while the height and width are adjusted to accommodate different lengths of hose. *See* EX1008.

326. As discussed above in Ground 6, the combination of *Van Vliet*, *AFD* and *Lowrie* render obvious Claim 3 from which Claim 4 depends. Accordingly, Claim 4 is rendered obvious by the combination of *Van Vliet*, *AFD*, *Lowrie* and *Coxreels*.

**3. Claim 5: "The distribution station as recited in claim 4, wherein the trailer has a trailer width of no greater than about 96 inches."**

327. The combination of *Van Vliet* and *AFD* render obvious "wherein the trailer has a trailer width of no greater than about 96 inches." As discussed in Section VIII.C above, and further described in Section XI.A.6, *Van Vliet* references a commercially-available trailer that had a width of 96 inches, and the maximum width of a vehicle which would have universal access to well sites (including ones on State and County maintained roads) is 96 inches. Therefore, it would have been obvious to a POSITA to design a trailer having a trailer width of no greater than the legal limit for universal access to well sites. Accordingly, the combination of *Van Vliet* and *AFD* renders the limitation in Claim 5 obvious.

**4. Claim 20: "The distribution station as recited in claim 19, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3."**

328. Claim 20 is essentially identical to Claim 4 (other than the references to different independent claim numbers) and is rendered obvious for the same reasons as those set forth in Section XI.G.2 above and incorporated herein. As

discussed above in Ground 6, the combination of *Van Vliet, AFD* and *Lowrie* render obvious Claim 19 from which Claim 20 depends. Accordingly, Claim 20 is rendered obvious by the combination of *Van Vliet, AFD, Lowrie* and *Coxreels*.

**5. Claim 21: "The distribution station as recited in claim 4, wherein the trailer has a trailer width of no greater than about 96 inches."**

329. Claim 21 is essentially identical to Claim 5 (other than the references to different independent claim numbers) and is rendered obvious for the same reasons as those set forth in Section XI.G.4 above and incorporated herein. Accordingly, Claim 20 is rendered obvious by the combination of *Van Vliet, AFD, Lowrie* and *Coxreels*.

### H. Ground 8: Claims 11 and 12 are rendered obvious by *Van Vliet* in view of *AFD* and *Coxreels*

#### 1. Rationale and motivation for combining *Van Vliet,* and *AFD* with *Coxreels*

330. The rationale and motivation for combining *Van Vliet* and *AFD* with *Coxreels* is the same as discussed for Ground 7 and is incorporated herein. *See supra.* Section XI.G.1.

**2. Claim 11: "The distribution station as recited in claim 1, wherein the aisle walkway has an aisle width and the reels have a reel diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3."**

331. *Coxreels*, when combined with *Van Vliet* and *AFD*, discloses or suggests "wherein the aisle walkway has an aisle width and the reels have a reel

diameter, and the aisle width is greater than the reel diameter by a factor of at least 1.3." For example, as discussed above with respect to Ground 5 in Section XI.E.2.i, and incorporated herein, *AFD* discloses a trailer with an aisle walkway down the middle to allow access to reels (to operate manual shut-off valves among other reasons). Because a human operates the manual shut-off valves in the combined system as taught by *Van Vliet*, OSHA Occupational Safety and Health Standards ("OSHS") require an exit path that is at least 28 inches wide at all points. OSHA regulations, contained in 49 CFR §1910.36(g)(2) require "An exit access must be at least 28 inches (71.1 cm) wide at all points.[376] Where there is only one exit access leading to an exit or exit discharge, the width of the exit and exit discharge must be at least equal to the width of the exit access."[377] *Coxreels* teaches a reel with a 17 and 5/8" diameter. Thus, the *Van Vliet-AFD* system using Coxreels' 1125 Series reel described in EX1008 would have a ratio between the walkway and the reel diameter of 1.588, which falls within the claimed range.

$$\frac{28"}{17.625"} = 1.588$$

[376] EX1031.

[377] *See also* EX1007 ("The self-contained unit has ***been built to meet and exceed fire code and hazardous location standards*** ….").

332. As discussed above in Ground 5, the combination of *Van Vliet* and *AFD* render obvious Claim 1 from which Claim 11 depends. Accordingly, Claim 11 is rendered obvious by the combination of *Van Vliet*, *AFD* and *Coxreels*.

**3. Claim 12: "The distribution station as recited in claim 11, wherein the aisle width is greater than the reel diameter by a factor of at least 1.5."**

333. For the same reasons explained regarding claim 11 above, and incorporated herein by reference, the combination of *Coxreels* with *Van Vliet* and *AFD*, discloses "wherein the aisle width is greater than the reel diameter by a factor of at least 1.5." *See supra.* Section XI.H.2.

## XII. SECONDARY CONSIDERATIONS

334. I am not aware of any secondary indicia applicable to the claimed invention. However, should the Patent Owner put forth any alleged evidence of secondary considerations in this proceeding or the related litigation, I reserve the right to consider such evidence, to consider whether any such evidence has a nexus to any claims of the Challenged Patent, and to update my analysis.

## XIII. CONCLUSION

335. In my opinion the '805 Patent does not claim a novel or non-obvious invention. For all the reasons explained above, the prior art anticipates or renders obvious the '805 Patent claims.

## XIV. DECLARATION

336. I hereby declare that all the statements made in this Declaration are of my own knowledge and true; that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Executed in Tulsa, OK on August 7, 2023.

/*Robert A. Durham*/
Robert A. Durham