

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BAZOOKA-FARMSTAR, LLC,

Petitioner

v.

NUHN INDUSTRIES LTD.,

Patent Owner

Case No. IPR2024-00004

Patent No. 11,491,835

**DECLARATION OF DOUGLAS S. PRAIRIE REGARDING
PATENT OWNER'S REVISED MOTION TO AMEND
U.S. PATENT NO. 11,491,835**

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I. INTRODUCTION

I, Douglas S. Prairie, declare as follows:

1. I have been retained by Nuhn Industries Ltd. (“Patent Owner” or “Nuhn”) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“USPTO”) regarding U.S. Patent No. 11,491,835 (“the ‘835 Patent”). I have been asked to consider whether certain references disclose or suggest the features recited in at least independent Substitute Claims 41, 57, 79, and 80 in Patent Owner’s Revised Motion to Amend the ‘835 Patent. My opinions are set forth below.

2. I have also been retained by Nuhn as an independent expert consultant in IPR2023-01161, which Bazooka-Farmstar, LLC (“Petitioner” or “Bazooka”) filed against U.S. Patent No. 11,358,425 (“the ‘425 Patent”), and IPR2024-00098, which Petitioner filed against U.S. Patent No. 11,541,708 (“the ‘708 Patent”). I previously provided declarations in those proceedings. The ‘835 Patent, the ‘425 Patent, and the ‘708 Patent are continuations filed off of a common PCT application.

3. In my previous declarations filed in the IPRs challenging the ‘835 Patent, the ‘425 Patent, and the ‘708 Patent, I describe the general background of the art and the teachings of the ‘835 Patent. I have not included those sections here for brevity, but incorporate those statements herein by reference.

4. I am being compensated at my typical rate of \$325 per hour for the time I spend on this matter. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

II. BACKGROUND AND QUALIFICATIONS

5. I am an agricultural engineer with over 25 years of experience in machine design and product development solutions, specializing in off-highway and agriculture machinery systems.

6. I grew up on a family grain and livestock farm in southern Minnesota where I operated tractors, tillage equipment, skid steers, and manure handling and spreading equipment. My father was a professional mechanic, so we serviced and repaired most of the machinery on our family's operation. I have in-laws who own and operate an 800 head dairy farm near Sioux Falls, South Dakota. I have worked at their dairy farm many times over the past 25 years helping with feeding, equipment maintenance, harvest, tillage, and working with their manure systems. The lagoon on their dairy farm is typical of most lagoons of their herd size in the upper Midwest. It is an earthen style structure with steep side walls and a shallower concrete apron where the tractor and power take-off ("PTO") powered agitator can be backed into the lagoon to agitate prior to the manure being pumped out. The lagoon often crusts over and has a fence around it to minimize the chance for someone to inadvertently walk on a surface that could easily be mistaken for a weedy pasture. My father-in-law always makes sure to remind me of the hazards of the lagoon when my children might happen to be playing near that area of the farm. Fall harvest operations keep everyone busy with their operations, so they often hire a commercial manure applicator to pump the lagoon out and spread or knife in the manure on their harvested ground prior to fall tillage. The commercial manure applicator sometimes brings a floating manure agitator to speed up the lagoon agitation process and produce a more homogenous manure product. The lagoon is pumped out annually in the fall and quite often during the summer months after alfalfa harvest.

7. I am currently employed in Brookings, South Dakota as a lecturer at South Dakota State University ("SDSU") in the Agriculture and Biosystems Engineering ("ABE") Department. SDSU is a premier land grant research and teaching institution and is the first in the country to offer a four-year Precision Agriculture Degree. Courses I am responsible for involve every aspect of the design, operation, service, and ownership of agriculture machinery systems, including livestock manure management technologies. My students include Agriculture and Biosystems Engineers, Mechanical Engineers, Electrical Engineers, Agriculture Technology students and Precision Agriculture students. These students enter the workforce into a wide variety of career

paths including design of agriculture machinery systems, design of livestock structures, design of manure management systems, livestock farm owners and operators, plus many other agriculture careers such as commercial manure applicators.

8. Prior to joining SDSU in August of 2016, I was employed within the agriculture and construction equipment industry for 20 years in roles ranging from design engineering to product and sales management. My experience includes design of planting and seeding equipment, design of concrete placing and cutting equipment, construction project management, design of high horsepower trash pumps, product/sales management of precision agriculture control systems, and research on cellulosic ethanol production systems.

9. In December of 2004, I received a master's degree from Boise State University in Mechanical Engineering, and in May of 1997, I received a bachelor's degree from SDSU in Agricultural Engineering with a Power and Machinery Focus.

10. I am a registered Professional Engineer in the State of Idaho.

11. I have designed and developed a wide variety of agricultural and construction equipment including planting and seeding equipment, precision agriculture control systems, concrete power trowels, concrete saws, and high horsepower job site trash pumps. One of the courses I lead at SDSU is a two-semester Capstone Design course for our senior ABE students. Students that select the Natural Resource tract of the ABE program often work on projects related to the design of agriculture livestock structures and livestock waste management systems. These capstone projects are sponsored by regional livestock farmers, so the students obtain exposure to actual, modern-day livestock industry design challenges.

12. I am the named inventor on 8 patents and 1 pending patent application. These patents are generally directed to seed delivery systems, agricultural implements, and concrete machinery.

13. I have consulted as an expert witness on previous intellectual property disputes involving patents. My work in this capacity has included, among other things, reviewing and

analyzing accused products, reviewing and analyzing patents, writing expert reports, and providing deposition testimony.

14. A copy of my curriculum vitae, a list of my patents and patent applications, and a list of the cases I have worked on as an expert witness are attached as EX2005.

III. MATERIAL CONSIDERED AND SUMMARY OF OPINIONS

15. The opinions contained in this Declaration are based on the documents I reviewed, my professional judgment, as well as my education, experience, and knowledge regarding agricultural equipment, farming operations, and manure lagoons.

16. In reaching the opinions and conclusions discussed herein, I reviewed, considered, and/or relied upon the following materials:

<i>Exhibit #</i>	<i>Description</i>
--	Bazooka-Farmstar, LLC's Petition for IPR2024-00004
1001	U.S. Patent No. 11,491,835 ("the '835 Patent")
1002	Prosecution History of U.S. Patent No. 11,491,835
1003	Curriculum Vitae of Eric Winkel
1004	Declaration of Eric Winkel, dated October 13, 2023 ("Winkel Decl.")
1005	U.S. Patent Application Publication No. 2012/0185129 ("Carrier")
1006	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER ("Truxor")
1007	Declaration of Jan David Arnoldsson, dated February 26, 2023
1008	Declaration of Reidar Olofsson, dated February 27, 2023
1009	Declaration of Nathaniel E Frank-White, dated December 12, 2022
1010	KR Publication No. 20130016490 ("Yoon")
1011	English Translation of Yoon (EX1010) and Declaration of Taylor Liff, dated June 7, 2023
1012	SENWATEC-SCHRÖER UMWELT-& GEWÄSSERTECHNOLOGIE GMBH & CO. KG, LIGHT AMPHIBIOUS BOAT/VEHICLE "AMPHI-KING®" SWT--AB380 ("SenwaTec")
1013	Declaration of Ansgar Lonnemann, dated June 15, 2023
1014	U.S. Patent Application Publication No. 2014/0112093 ("Puck")

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1015	U.S. Patent No. 7,314,395 (“Bryham”)
1016	U.S. Patent Application Publication No. 2014/0288763 (“Bennett”)
1017	U.S. Patent Application Publication No. 2021/0331752 (“Bennett-II”)
1018	U.S. Provisional Patent Application No. 61/805,133 (“the ‘133 Provisional”)
1019	U.S. Patent No. 7,478,817 (“Carrier-II”)
1020	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (2013) (“Truxor-II”)
1021	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (2013) (“Truxor-III”)
1022	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (“Truxor-IV”)
1023	Russian Patent Application No. 2012137830/11 (“Melnikov”)
1024	English Translation of Melnikov (EX1023) and Declaration of Samuel Goldfarb, dated June 7, 2023
1025	Johanna Kaschik, Der Frosch als Vorbild, HNA (August 25, 2011), https://www.hna.de/lokales/rotenburg-bebra/frosch-vorbild-1376974.html
1026	English Translation of Der Frosch als Vorbild (EX1026) and Declaration of Beverly Santamaria, dated June 8, 2023
1027	Screenshots from UD Umwelt-Dienste GmbH Amphi-King Manure Pumping Video
1028	U.S. Patent No. 8,944,758 (“the ‘758 Patent”)
1029	U.S. Provisional Patent Application No. 61/867,598 (“the ‘598 Provisional”)
1030	Excerpts of Prosecution History of U.S. Patent No. 10,710,422
1031	Excerpts of Prosecution History of U.S. Patent No. 10,974,557
1032	Excerpts of Reexamination History of U.S. Patent No. 10,974,557
1033	Stipulation Regarding Invalidity Contentions Filed in the ‘015 Litigation
1034	NE. REG’L AGRIC. ENG’G SERV., LIQUID MANURE APPLICATION SYSTEMS DESIGN MANUAL (1998)
1035	DONALD L. PFOST & CHARLES D. FULHAGE, U. MO. EXTENSION, LAND APPLICATION EQUIPMENT FOR LIVESTOCK AND POULTRY MANURE MANAGEMENT (2001)
1036	DONALD L. PFOST & CHARLES D. FULHAGE, U. MO. EXTENSION, BEEF MANURE MANAGEMENT SYSTEMS IN MISSOURI (2000)

1037	William F. Wright, <i>Dairy Manure Particle Size Distribution, Properties, and Implications for Manure Handling and Treatment</i> , in 2005 ASAE ANN. INT'L MEETING (2005)
1038	EFFECTS OF LIQUID VISCOSITY ON ROTODYNAMIC (CENTRIFUGAL AND VERTICAL) PUMP PERFORMANCE (AM. NAT'L STANDARDS INST. 2010)
1039	Ole Thygesen et al., <i>Indicators of Physical Properties and Plant Nutrient Content of Animal Slurry and Separated Slurry</i> , 5(3) BIOLOGICAL ENG'G TRANSACTIONS 123 (2012)
1040	Randy L. Beaver, William E. Field, <i>Summary of Documented Fatalities in Livestock Manure Storage and handling Facilities—1975-2004</i> , 12 J. AGROMEDICINE 3 (2007)
1041	ROBBIN MARKS, NAT'L RES. DEF. COUNCIL AND THE CLEAN WATER NETWORK, CESSPOOLS OF SHAME (2001)
1042	Dwight D. Bowman & Jeffrey C. Burnham, <i>Manure Pathogens: Real Issues and Real Risks</i> , in PROCEEDINGS OF THE WATER ENV'T FED'N 694 (2000)
1043	U.S. Ctr. for Disease Control, <i>Fatalities Attributed to Entering Manure Waste Pits - Minnesota, 1992</i> , 42 MORBIDITY & MORTALITY WKLY REP. 325 (1993)
1044	U.S. CTR. FOR DISEASE CONTROL, NAT. INST. FOR OCCUPATIONAL SAFETY AND HEALTH, PREVENTING DEATHS OF FARM WORKERS IN MANURE PITS, Publ. No. 90-103 (1990)
1045	U.S. GOV'T ACCOUNTABILITY OFF., GAO-05-96, WORKPLACE SAFETY AND HEALTH: SAFETY IN THE MEAT AND POULTRY INDUSTRY, WHILE IMPROVING COULD BE FURTHER STRENGTHENED (2005)
1046	SIDUO ZHANG, NAT'L COLLABORATING CTR. FOR ENV'T HEALTH, AIR QUALITY AND COMMUNITY HEALTH IMPACT OF ANIMAL MANURE MANAGEMENT (2011)
1047	MANURE STORAGE SAFETY ASAE EP470 JAN1992 (AM. SOC'Y OF AGRIC. AND BIOLOGICAL ENG'GS 2005)
1048	MIDWEST PLAN SERV., LIVESTOCK WASTE FACILITIES HANDBOOK (3d ed. 1993)
1049	C.A. Loto & A.P.I Popoola, <i>Environmental Surface Degradation of Galvanised and Mild Steels in Cattle and Poultry Wastes and Urea Solution</i> , 6(13) INT'L J. PHYS. SCI. 3074-81 (2011)
1050	L.M. Safley, Jr. & P.W. Westerman, <i>Corrosion of Galvanized Steel in Animal Waste Environments</i> , 40 BIORESOURCE TECH. 53 (1992)
1051	FRANK YEAPLE, FLUID POWER DESIGN HANDBOOK (3d ed. 1995)

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1052	Charles D. Fulhage, <i>Solids Removal from Livestock Manure Lagoons</i> , U. MO. EXTENSION (Nov. 1995), https://extension.missouri.edu/publications/wq324
1053	U.S. Patent No. 613,809
1054	ED ODGERS ET AL., MANURE GAS SAFETY: REVIEW OF PRACTICES AND RECOMMENDATIONS FOR WISCONSIN LIVESTOCK FARMS (2008)
1055	U.K. Patent App. No. 2,366,218
1056	U.S. DEP'T AGRIC., <i>Agricultural Waste Characteristics</i> , in AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 4 (2008)
1057	U.S. DEP'T AGRIC., <i>Agricultural Waste Management System Component Design</i> , in AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 10 (2009)
1058	U.S. DEP'T AGRIC., <i>Waste Utilization</i> , in AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 11 (2013)
1059	U.S. DEP'T AGRIC., <i>Waste Utilization</i> , in AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 11 (1996)
1060	U.S. DEP'T AGRIC., <i>Waste Management Equipment</i> , in AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 12 (2011)
1061	U.S. DEP'T AGRIC., <i>Operation, Maintenance, and Safety</i> , in AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 13 (2011)
1062	Scheduling and trial Setting Order in the '015 Litigation (Dkt. 76)
1063	Certificate of Correction for U.S. Patent No. 10,124,638
1064	Declaration of Michael A. Erbele
1065	Order Granting in Part and Denying in Part Defendant's Motion to Modify Scheduling Order
1066	Complete copy of UD Umwelt-Dienste GmbH Amphi-King Manure Pumping Video (EX1027)
1067	English Translation of UD Umwelt-Dienste GmbH Amphi-King Manure Pumping Video (EX1066) and Declaration of Ute von Wietersheim, Dated January 31, 2024
1068	<i>Gequirlder Klärschlamm</i> , MAIN POST, https://www.mainpost.de/regional/main-spessart/gequirlder-klaerschlam-art-5778615 (last updated Oct. 15, 2010)
1069	English Translation of <i>Gequirlder Klärschlamm</i> (EX1068) and Declaration of Ute von Wietersheim, Dated January 27, 2024
1070	<i>Custom Applicator Uses Dredge to Pump Lagoons</i> , 33 FARM SHOW MAG., no. 4, 2009, at 9
1071	Don D. Jones et al., <i>Closure of Earthen Manure Structures (Including Basins, Holding Ponds and Lagoons)</i> , (Animal Agric. & Env't: Nat'l Ctr. Manure & Waste Management White Paper No. 11, 2006),

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	https://elibrary.asabe.org/azdez.asp?JID=6&AID=20256&CID=aae2006&T=2&confid=aae2006&redirType=animal_agriculture.asp
1072	Declaration of Eckhard Funck, Dated March 8, 2024
1073	English Translation of Declaration of Eckhard Funck (EX1072) and Declaration of Ute von Wietersheim, Dated March 12, 2024
1074	Declaration of Reinhard Speerschneider, Dated April 24, 2024
1075	English Translation of Declaration of Reinhard Speerschneider (EX1074) and Declaration of Ute von Wietersheim, Dated May 9, 2024.
1076	Excerpts of the Transcript of the Parties' Meet and Confer in the '015 Litigation, dated June 26, 2024
1077	Excerpts of Email Correspondence between the Parties' Litigation Counsel in the '015 Litigation
1078	Petitioner's Proposed Amended Protective Order
1079	The Parties' Stipulated Proposed Protective Order
1080	The Parties' Redlined Stipulated Proposed Protective Order
1080- 1086	Intentionally Omitted
1087	USDA DAIRY FORAGE RESEARCH CENTER ET AL., NORTHAMERICAN MANUREXPO PROFESSIONAL MANURE MANAGEMENT (2012).
1088- 1109	Intentionally Omitted
1110	Declaration of Eric Winkel in Support of Petitioner's Reply to the Patent Owner's Response, Dated October 1, 2024
1111	Declaration of Eric Winkel in Support of Petitioner's Opposition to Patent Owner's Motion to Amend, Dated October 1, 2024
1112	MANURE MANAGER, Jan./Feb. 2011 (Manure-Manager)
1113	MANURE MANAGER, July/Aug. 2011 (Manure-Manager-II)
1114	Fisher Pumps, Inc., FISHER PUMPS
1115	Declaration of Royal Burrows, Dated June 21, 2023
1116	Deposition Transcript of Ian Nuhn, Taken on May 30, 2024
1117	Deposition Transcript of Douglas Prairie, Taken on June 25, 2024
1118	U.S. DEP'T AGRIC., WILDLAND FIRE ENGINE GUIDE (2000)
1119	Declaration of Benny D. Puck, Dated July 31, 2024
1120	Declaration of Ernie Sundstrom, Dated August 1, 2024
1121	Declaration of Benny D. Puck, Dated August 28, 2024
1122	Puck Enterprises, Inc., <i>Puck Agitation Boat - 2012</i> , YOUTUBE (Sept. 19, 2012), https://www.youtube.com/watch?v=1fRPrwGUyM0 (referred to as "Exhibit A" in EX1121)

1123	Puck Enterprises, Inc., <i>Puck Lagoon Agitation Boat and MobileStar Pump Control</i> , YOUTUBE (Dec. 28, 2011), https://www.youtube.com/watch?v=cMplzZ6lRYE (referred to as “Exhibit B” in EX1121)
1124	Puck Enterprises, Inc., <i>Puck Agitation Boat - Jeremy Puck</i> , YOUTUBE (Aug. 10, 2011), https://www.youtube.com/watch?v=1MqPldkqOq4 (referred to as “Exhibit C” in EX1121)
1125	Puck Enterprises, Inc., <i>Puck Agitation Boat - Ben Puck</i> , YOUTUBE (July 29, 2011), https://www.youtube.com/watch?v=gfNO0bi0uk0 (referred to as “Exhibit D” in EX1121)
1126	Puck Enterprises, Inc., <i>Puck Agitation Boat - Front Cannon 8.30.11</i> , YOUTUBE (Sept. 9, 2011), https://www.youtube.com/watch?v=4whiyZZ9N3s (referred to as “Exhibit E” in EX1121)
1127	<i>Between</i> , MERRIAM-WEBSTER.COM, http://web.archive.org/web/20130518001225/https://www.merriam-webster.com/dictionary/between
1128	Progressive Dairy, <i>Equipment demonstrations: Manure agitation boats</i> , YOUTUBE (July 9, 2014), https://www.youtube.com/watch?v=FXRS-9Ip1pE (referred to as “Exhibit C” in EX1120)
1129	<i>Hydrostatic Pto's Run in Reverse</i> , 1 FARM SHOW 1, 7 (1977)
1130	RICHARD S. HARTENBERG & JACQUES DENAVIT, KINEMATIC SYNTHESIS OF LINKAGES 38-39 (Robert M. Drake, Jr. & Stephen J. Kline, eds., 1964)
1131	Deposition Transcript of Ansgar Lonnemann, Taken on September 6, 2024
1132	Deposition Transcript of Reidar Olofsson, Taken on September 5, 2024
1133	T.H. MORRELL, SOC'Y OF AUTO. ENG'RS TECH. PAPER NO. 800943, THE DEVELOPMENT OF AGRICULTURAL EQUIPMENT POWER TAKE- OFF MECHANISM (1980)
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2107	U.S. Patent Application Publication 2013/0145980 to Puck (“Puck II”)
2108	Chart Showing Support For Substitute Claims
2109	Redline Comparison between U.S. Provisional Patent Application No. 61/867,598 and International Patent Application No. PCT/CA2014/050789

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2114	Redline Comparison between U.S. Provisional Patent Application No. 61/867,598 and U.S. Patent Application No. 17/201,100 (now U.S. Patent No. 11,491,835)
2115	Nuhn Header Series Vertical Pit Pump Brochure

17. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art (“POSITA”), as defined below, would have understood the claims and the specification of the ‘835 Patent at the time of the alleged invention.

18. As I discuss in detail below, it is my opinion that the prior art of record fails to disclose or render obvious the Substitute Claims present in Patent Owner’s Revised Motion to Amend, including at least independent Substitute Claims 41, 57, 79, and 80.

19. As I discuss in detail below, it is my opinion that the prior art cited in Petitioner’s Opposition to Patent Owner’s Revised Motion to Amend the ‘835 Patent fails to disclose or render obvious the Substitute Claims proposed in Patent Owner’s Revised Motion to Amend, including at least independent Substitute Claims 41, 57, 79, and 80. In particular, it is my opinion that Petitioner has not demonstrated that Substitute Claims 41-80 are rendered unpatentable as obvious over Puck in view of the Puck Boat, Bryham, and Manure-Manager under 35 U.S.C. § 103.

IV. APPLICABLE LEGAL STANDARDS AND PRINCIPLES

20. I am not an attorney and do not purport to offer legal opinions. In forming my opinions, however, I have been asked to apply certain standards pertaining to the patentability issues presented in this proceeding that I know from my experience as an inventor and expert witness or were provided to me by counsel for the Patent Owner.

21. I understand that for a patent to be valid, the invention claimed in the patent must be new, useful, and non-obvious. I understand that, in this *inter partes* review, the Petitioner has the burden of proving that each challenged claim is unpatentable by a preponderance of the evidence.

A. The Prior Art

22. I understand that applicable patent law provides categories of information that constitute prior art that may be used to “anticipate” patent claims or to render them “obvious.” I understand that for a reference to qualify as “prior art” in an *inter partes* review, the reference must have been published, patented, or must have been the subject of a patent application by another person, before the priority date of the patent, and in this matter, must satisfy one of the standards of 35 U.S.C. § 102.

B. Anticipation

23. I understand that a claim of a patent is invalid if the claimed invention is not new. I understand that the scope of prior art is limited in *inter partes* reviews. It is my understanding that a claimed invention is not new if all the limitations of the claim are described in a single prior art reference, and as arranged in the claim.

24. I understand that the prior art reference does not have to use the same words as those used in the claim, but that all the limitations must be present, either expressly or inherently, so that a person having ordinary skill in the art viewing the reference would have everything necessary to make and use the invention as claimed. I understand that something is inherent in a prior art reference if it necessarily exists in the prior art reference.

25. Therefore, it is my understanding that a single prior art reference that discloses each requirement of a claim, either expressly or inherently, invalidates the claim by anticipation.

C. Obviousness

26. I understand that a claim is unpatentable if the differences between the claim and the prior art are such that the claimed subject matter as a whole would have been obvious to a

person having ordinary skill in the art. Obviousness may be shown by a single prior art reference or by a combination of prior art references.

27. Although I understand that a finding of obviousness may be based upon combining prior art references, I also understand that a patent claim may not be proved obvious merely by demonstrating that each of its limitations was independently known in the prior art. I further understand that there must be a motivation to combine elements of the prior art in the manner claimed. I also understand that a claim cannot be found obvious based on a hindsight combination of components selected from the prior art using the patent claims as a roadmap.

28. I further understand that in determining whether a prior art reference would have been combined with other prior art, a showing must be made that a person of ordinary skill in the art would have a reasonable expectation that the asserted combination could be made successful and would achieve the claimed invention.

29. In determining whether a claim would have been obvious, I understand that obviousness is determined from the perspective of a person having ordinary skill in the art in the field of the claimed invention. I understand that as part of my analysis of whether a given patent claim is obvious, I should consider: (1) the level of ordinary skill in the pertinent art; (2) the scope and content of the prior art; (3) the differences, if any, between the prior art as a whole and the claim at issue; and (4) as appropriate, secondary considerations of non-obviousness.

D. Written Description

30. I understand from counsel that for a patent claim to be valid under the written description requirement set forth in 35 U.S.C. §112(a), the subject matter recited in the claim must be described in the patent specification in such a way as to reasonably convey to a person of ordinary skill in the art that the inventor had possession of the claimed invention at the time the application was filed.

V. PERSON OF ORDINARY SKILL IN THE ART

31. I understand that Petitioner asserts that a POSITA for the technology underlying

the ‘835 Patent would have had “a bachelor’s degree in mechanical engineering or similar field, and two years of professional experience in marine and off-road vehicles. A [POSITA] would have had a working knowledge of fluid pumps and livestock manure.” Petition, p. 31; EX1004, Winkel Decl. ¶82. Petitioner also states that a “[l]ack of work experience can be remedied by additional education, and vice versa.” *Id.*

32. I disagree with the Petitioner’s definition of a POSITA because it excludes those most familiar with manure agitation equipment – livestock farmers and commercial manure applicators. A commercial manure applicator is a person who is employed by a business entity engaged in the business of transporting, handling, storing, or applying manure for a fee. *See* EX2024. It is commonplace in the agricultural industry for end users of farm equipment to be highly knowledgeable of its design, operation, and limitations because they use, maintain, and modify it.

33. The Petitioner’s definition of a POSITA is overly generic and made without reference or regard to the sole application for the claimed vehicle – manure lagoon agitation/pumping. Moreover, “professional experience in marine and off-road vehicles”, general experience in “designing agricultural equipment”, or “working knowledge of . . . livestock manure”, does not equate to experience, generally, in a niche art—the care of agricultural lagoons and agitating and pumping of agricultural lagoons.

34. The ‘835 Patent repeatedly mentions “animal husbandry” (i.e., livestock farming operations) and the problems encountered when storing and pumping animal manure in farm lagoons or pits. EX1001, ‘835 Patent, col. 1, ln. 26-49; col. 3, ln. 14-21; col. 7, ln. 20-46; col. 8, ln. 5-25.

35. Moreover, the ‘835 Patent has been classified as being directed to “amphibious vehicles specially adapted for particular purposes” and “manure” handling:

Classifications

- B60F3/0061 Amphibious vehicles specially adapted for particular purposes or of a particular type
- A01C23/045 Filling devices for liquid manure or slurry tanks
- A01C3/026 Storage places for manure, e.g. cisterns for liquid manure; Installations for fermenting manure with mixing or agitating devices

EX2009, p. 3.

36. The ‘835 Patent does not suggest that the claimed vehicle finds utility in doing anything other than operating in manure lagoons.

37. Based on this intrinsic evidence, it is my opinion that a POSITA is “a livestock farmer or commercial manure applicator familiar with manure agitation equipment or an engineer with at least 2 years of experience designing agricultural equipment and knowledge of manure agitation equipment.”

38. All of my opinions in this declaration are from the perspective of a POSITA, as I have defined it in the preceding paragraph, during the relevant timeframe of August 2013.

VI. CLAIM CONSTRUCTION

39. I understand that in an *inter partes* review proceeding, the claim terms are to be construed in accordance with the ordinary and customary meaning of such term as understood by a POSITA. I understand that when interpreting the claims, the primary focus must be on the intrinsic evidence, which consists of the claim language, the specification, and the prosecution history. I further understand that extrinsic evidence, such as definitions found in dictionaries and handbooks, is less pertinent and persuasive than the intrinsic evidence. I also understand that express definitions of terms in the patent should govern the construction of the claims. I have followed these claim construction principles in my analysis.

A. “along the longitudinal centerline”

40. Substitute Claims 41 and 57 require components/portions of the vehicle that are submerged when the vehicle is floating to be positioned forward or and rearward of the pump housing “along the longitudinal centerline” of the floatable vehicle body.

41. Dr. Winkel asserts that phrase “along the longitudinal centerline” means “on or next to the longitudinal centerline.” EX1174, ¶13. I disagree with this interpretation because it eviscerates the geometric position claimed. The phrase “or next to” in Dr. Winkel’s construction expands this limitation to cover structure that is positioned to the right or left of the longitudinal centerline. In my opinion, this is contrary to how a POSITA would understand the phrase “along the longitudinal centerline.” A POSITA would understand that the language requiring a submerged component/portion of the vehicle to be “along the longitudinal centerline” to mean that the component/portion of the vehicle is centered between / with respect to the right and left sides of the vehicle. In my opinion, a POSITA would not understand components or portions of the vehicle positioned to the right or left of the longitudinal centerline to be positioned “along the longitudinal centerline” within the meaning of the claims. If a component or portion of the vehicle is to the right or left of the longitudinal centerline, it necessarily follows that it is not positioned along the longitudinal centerline. For that reason, a POSITA would find it illogical to describe a component that is closer to right side of the vehicle and further from the left side of the vehicle (or vice versa) as being positioned “along the longitudinal centerline.”

42. If the phrase “along the longitudinal centerline” is not limited to structures on the longitudinal centerline and includes structures to the right and left of the longitudinal centerline, the phrase “along the longitudinal centerline” becomes superfluous as it adds nothing to further define the position of the submerged component / portion of the vehicle.

43. Dr. Winkel’s construction is inconsistent with Petitioner’s own dictionary evidence, which defines “along” as “at a point or points on.” EX1175. The words “or next to” is not part of the definitions found in EX1175.

44. Petitioner’s construction is also inconsistent with the specification of the ‘835 Patent, which uses the phrase “along the longitudinal centerline” to describe the location of the center of gravity:

“The center of gravity may be located along the longitudinal centerline of the vehicle. The center of gravity may be located substantially in the middle of the vehicle, for example at an intersection of longitudinal centerline of the vehicle and the transverse centerline of the vehicle. The center of gravity may be located rearward of the transverse centerline of the vehicle. The center of gravity may be located forward of the transverse centerline of the vehicle.”

EX1001, col. 4, ln. 20-26.

This language of the ‘835 Patent explains that the vehicle is designed to have a center of gravity that is positioned at a point on the longitudinal centerline, which may be at the intersection of the longitudinal and transverse centerlines or on the longitudinal centerline, but forward or rearward of the transverse centerline. Nothing in this language suggests that the term “along the centerline” would include locations that are to the right or left of the longitudinal centerline, which the phrase “or next to” covers. Dr. Winkel’s attempt to broaden the meaning of the term “along” to include “next to” is simply not supported by the intrinsic or extrinsic documentary evidence.

45. In view of the language in the ‘835 Patent quoted above and the dictionary definition set forth in EX1175, it is my opinion that the proper construction of the claim term “along the longitudinal centerline” is “on the longitudinal centerline.”

B. “liquid manure pump”

46. The Substitute Claims of the ‘835 Patent use the term “liquid manure pump.”

47. The Institution Decision (Paper 12, pp. 17-18) suggested that the Parties need to further develop what specific structure is required to pump liquid manure, but in my opinion that attempts to apply a bright-line rule to a question that is not clear cut. For example, the “Liquid Manure Application Systems Design Manual” (EX1034 at pp. 51-52) cited by Petitioner identifies a number of different types of pumps including closed impeller, semi-open impeller, open impeller, elevator, helical screw, piston, and air-driven pumps. There is no bright line rule

delineating these various pump types where one type is universally considered a liquid manure pump and another type is not. Most likely any one of these types of pumps could be designed to pump liquid manure if provided with an appropriate materials, size, tolerances/clearances, flow rate, pump head, power requirements, and appropriate housing, impeller, inlet, outlet, seals, and bearing design.

48. Because there are no bright-line rules, a POSITA would look at the following pieces of evidence to understand if a pump is a “liquid manure pump” (i.e., a “pump that pumps liquid manure” or a “pump with a structure that is capable of pumping liquid manure with suspended solids”):

- (1) was the pump designed to pump liquid manure;
- (2) was the pump marketed as a liquid manure pump;
- (3) has the pump been tested and validated (i.e., proven) for liquid manure pumping applications; and
- (4) does the pump have structure that would become clogged and/or damaged by pumping liquid manure.

49. POSITAs understand that a “liquid manure pump” is a particular type/class of pump that you can go out and buy / select for manure pumping applications. Indeed, references to “manure pumps” are scattered throughout various advertisements and articles in the Manure-Manager publications (EX1112 and EX1113), demonstrating that this is a term known and used by POSITAs in the art to reference to a particular type / class of pumps. Liquid manure pumps differ from ordinary pumps in that the materials and components of a liquid manure pump must be capable of withstanding the highly corrosive environment of liquid manure lagoons and the shear behavior / forces associated with pumping a non-Newtonian fluid. They must also have components and tolerances that will perform in liquid manure pumping applications without failure or clogging.

50. The ‘835 Patent discloses an exemplary liquid manure pump, which is described as

a “fluid pump 9 [that] comprises a pump housing 18 with three tangential fluid outlets 19 that are combined into a single fluid conduit 20” (EX1001 at 5:43-45) and further states that an “example of pump 9 suitable for use with the vehicle is disclosed in co-pending U.S. Patent Application Ser. No. 13/038,189. . . .” (EX1001 at 7:43-45). The ‘835 Patent defines non-limiting embodiments of a liquid manure pump that a POSITA would understand as sufficient structure for pumping liquid manure or a liquid with suspended solids. If a pump departed from this exemplary design, then in my opinion, a POSITA would look to evidence of the enumerated factors above to determine if the pump could accurately be characterized as a “liquid manure pump.”

51. Suspended solids in liquid manure include the hard, thick crust, solid chunks of the crust, bedding material, any vegetation growing in the crust, and any sludge that has been stirred up from the bottom of the lagoon.

52. Dr. Winkel alleges that “[c]onventional water pumps were known for pumping liquid manure and manure slurries” and “[c]onventional water pumps were regularly used for this purpose because liquid manure has a similar consistency to water.” EX1004, Winkel Decl. ¶ 97. But Dr. Winkel also goes on to admit that “[o]ne potential concern associated with pumping liquid manures is the presence of larger solids and/or fibrous materials which can reduce efficiency or even plug/clog pump impellers and pumping systems, depending on the manure properties and the specific application.” *Id.* at ¶ 107. He then admits that there is a limit to the size of solids that water pumps can handle, stating: “Water pumps are typically capable of handling solid matter up to a specific size.” *Id.* As I describe herein, liquid manure does not have a similar consistency to water.

53. Like many of the exhibits that Dr. Winkel cites, they tend to refute his arguments that a water pump is capable of pumping liquid manure. For example, rather than stating that any “conventional water pump” can be used to pump animal waste, Chapter 12 of the AWMFH states that “[p]ump selection and rating depend on the amount and type of solids in the waste (see chs. 4 [EX1062], 9 [EX2023], and 11 [EX1064, EX1065] of this handbook), capacity desired, head or operating pressure needs, and available power.” EX1066 at 42. Acknowledging that manure is not

like water, Chapter 12 of the AWMFH further describes the severe conditions that manure pumps are subjected when pumping manure:

The wear on most pump bearings and seals is rapid when pumping waste. The severe pumping conditions also damage controls and valves. Regular lubrication and cleanup extend pump life and performance. A spare pump should be readily available to replace essential pumps in a waste system when they break down.

Id.

54. Dr. Winkel cites to the LMASD Manual to argue that “pumps designed for conventional water irrigation” can be used to pump liquid manure. EX1004, Winkel Decl. 103. However, the sentence he quotes specifically limits its statements to “liquid manures with less than approximately 4% total solids.” *See* EX1040 at 54. Elsewhere in the LMASD manual, it makes clear that liquid manure can include solids content much higher than 4%. *See id.* at 17 (“Liquid manure is *sometimes* defined as a mixture having less than **8 to 10% solids**, but **this range is arbitrary and no industry standard exists**. The categories solid, semisolid, and liquid (figure 1.1) merely provide a convenient way to discuss manure handling.”) (emphasis added); *see also id.* at 18 (“For example, a mixture containing 115 pounds of **liquid manure (13% TS)** and 55 pounds of inorganic sand bedding (95% TS) will remain an unstackable semisolid even though the mixture has an actual total solids content of approximately 40%.”) (emphasis added); *id.* at 28 (Table 1.5 showing liquid manures with total solids of up to 14%). Thus, as described above, a POSITA would understand that liquid manure is not limited to 5% total solids as Petitioner suggests and that a “conventional water” pump would not be able to pump liquid manure.

55. When properly evaluated and as understood by a POSITA, the LMASD Manual describes that “[w]hen the total solids content is between 4% and 12%, special chopper pumps and sprinklers **must be used** to avoid equipment clogging problems.” *Id.* at 16 (emphasis added). Contrary to Dr. Winkel’s assertion that “conventional water pumps” can be used to pump liquid

manure, the LMASD Manual clearly describes that specialized pumps are best for agitating and pumping: “**High volume, chopper-type, liquid manure pumps are best for agitation and pumping.**” *Id.* at 57 (emphasis added). Furthermore, a POSITA would have understood that lengthy agitation was required to completely mix the liquid manure prior to pump out and that special liquid manure pumps are **required** in order to accomplish the job:

Generally, a six-month accumulation of slurry in a large earthen storage requires about four to twelve hours of agitation for complete mixing. Propeller-type agitator or agitation pumps with large capacities are required. Most inclined shaft choppers have an effective radius of agitation of about 75 feet (table 3.2, page 42). For agitation, the discharge stream of a chopper-agitator pump is first directed over the surface of the storage to break up any floating matter or crust. Next, the stream is directed below the liquid surface to re-suspend settled bottom solids. A pump equipped with a chopper or rotating auger section at the inlet is better able to break up the surface crust and draw solids into the pump. A typical inclined-shaft chopper pump discharges between 3,000 gallons per minute and 5,000 gallons per minute.

EX1040 at 61. Even in the irrigation context—after agitation—the LMASD Manual’s indication that a chopper pump be positioned ahead of an irrigation pump illustrates that “conventional water pumps” will not work for pumping liquid manure:

In high-pressure pumping of liquid manure for irrigation, it is critical that the slurry be well mixed and free of large foreign material. High-pressure pumping of dairy manure works best if a chopper is positioned ahead of the pump. In some storages, a PTO-driven chopper-agitator pump is used in addition to a closed impeller irrigation pump rather than attaching a cutter or beater blade to the closed impeller. Pumping liquid manure for irrigation requires pumps specially designed to fit the pressure and flow requirements of the application system (see “High-Head Pumps,” page 54). Irrigation systems should also have a source of clean water or compressed air to flush lines and wash any growing vegetation after liquid manure irrigation to prevent possible ammonia burn.

Id.

56. I acknowledge that when liquid manure does have low solids content, specialized agitation or liquid manure pumps may not be required. However, as described herein, a POSITA would not understand liquid manure to be limited to fluid with 5% or less total solids; rather, a POSITA would have understood that liquid manure can and often does have total solids content well above 5%. *See supra* Section IX.A.1. And the LMASD Manual recognizes—rather than ignores—the variability of the total solids content of liquid manure and that at total solids content above 4%, “conventional water pumps” simply will not work to pump liquid manure, but that specialized pumping equipment is **required**:

The decision of whether to haul manure or to pump it through pipes depends on several factors. One of the most important factors is the solids content of the manure. Manure slurries with up to about 4% total solids can be handled with essentially the same equipment as water, with some precautions. Slurries with solids over 4% generally require special equipment to be pumped (see “Storage Agitation and Emptying,” page 47). With proper separation, dilution,

EX1040 at 61. The LMASD Manual also explains that manure pump manufacturers publish pump curves to assist POSITAs in determining the proper pump for the needs of the pumping system.

See id. at 66-67. Importantly, it explicitly states that “[p]ump curves are based on actual pump tests. Since pump tests are done with clean water, care must be used when applying manufacturer’s performance data to manure.” *Id.* at 66. This also teaches that mere “conventional water pumps” are not suited for pumping liquid manure. Thus, the LMASD Manual clearly illustrates that a POSITA would have understood that a fluid pump for pumping liquid manure would not be a mere “conventional water pump” but would be a pump specifically designed to pump liquid manure, one that could pump the crust and the other solids suspended therein.

57. Even Puck (EX1014) relied upon by Petitioner describes that its liquid manure or slurry pump 38 is “most preferably” designed to move “about sixteen thousand liters of material per minute” and “is capable of handling manure crust, supernatant, sludge, and the combined slurry.” *See* EX1014 at ¶¶ [0025], [0026]. As such a POSITA would have understood that in order to pump the liquid manure—including the solids and crust suspended therein—more than just a mere “conventional water pump” would be required.

58. Dr. Winkel further alleges that the LMASD Manual “similarly describes the use of water pumps for pumping and irrigation. *See* EX1004, Winkel Decl. ¶ 104. But Dr. Winkel’s arguments—likely due to his complete lack of experience in manure lagoon agitation and pumping—are focused on the pumping of liquid manure *after* it has been agitated and the surface crust has been disrupted. Specifically, his citation to the statement in the LMASD Manual that “Semi-open impeller centrifugal pumps are often used for pumping and irrigation of liquid manure slurries with solids contents up to 10%” (EX1040 at 65-67) refers not to agitating and pumping within a manure lagoon, but refers to pumping for irrigation after the liquid manure lagoon is agitated. Additionally, this statement does not support Dr. Winkel’s argument that water pumps are used; rather it states that liquid manure pumps can be used for irrigation. Simply, that a liquid manure pump can be used for irrigation does not mean that water pumps can be used for pumping liquid manure.

59. Therefore, the LMASD Manual demonstrates that pumping liquid manure—and

not just liquid manure with Petitioner’s artificially imposed 5% total solid content limit—requires the use of special pumps; not mere water pumps. Accordingly, a POSITA would understand that “conventional water pumps” would not be capable of agitating and pumping liquid manure.

60. Petitioner’s construction of “liquid manure pump” as “a pump with structure capable of pumping liquid with suspended solids” also overgeneralizes and impermissibly broadens the scope of the “liquid manure pump” limitation to no longer require a pump that is capable of pumping liquid manure. Liquid manure is not simply a fluid with suspended solids. In addition to containing suspended solids, liquid manure is highly corrosive and acts as a non-Newtonian fluid when pumped.

61. Dr. Winkel readily admits that a POSITA would have understood that liquid manure lagoon is highly corrosive. *See* EX1004, Winkel Decl. ¶ 120.



Dr. Winkel even cites studies reporting that “several millimeters of material could be lost from a metallic plate in a year’s time” when placed in a manure lagoon and “describe some metal samples losing the entirety of their metal mass in less than 30 months of exposure to the lagoon surface.” EX1004, ¶120; EX1049, 5; EX1050; 8.

62. The construction proposed by Petitioner and Dr. Winkel defining a “liquid manure pump” as “a pump with structure capable of pumping liquid with suspended solids” completely overlooks the undisputed fact that liquid manure is highly corrosive and would corrode/damage the components, bearings, and seals of traditional water pumps – even water pumps capable of pumping suspended solids.

63. Water behaves as a Newtonian fluid. Dr. Winkel ignores that cattle manure—even at 1 to 2% total solids content—has been found to act as a **non-Newtonian** fluid. *See, e.g.*, EX2097 at 2, H. Landry et al., *Physical and Rheological Properties of Manure Products*, APPLIED ENGINEERING IN AGRICULTURE, at 278 (2004) (discussing study by Chen (1982) that “included rheological properties for TS ranging from 1% to 14%. Beef cattle slurries were described as non-Newtonian pseudoplastic fluids, the deviation from Newtonian behavior increasing with TS”); *id.* at 2 (“Achkari-Begdouri and Goodrich (1992) studied the rheological properties of Moroccan dairy cattle manure with total solids concentrations ranging from 2.5% to 12% at temperatures between 20°C and 60°C. Their results showed that in the ranges of total solids and temperature of the study, Moroccan dairy cattle manure behaved as a pseudoplastic fluid.”); *see also id.* at 11 (“The animal manures studied were non-Newtonian pseudoplastic fluids and the power law could be used to relate shear stress and shear rate. The value of the consistency coefficient increased with the total solids concentration. The apparent viscosity was well correlated to TS for dairy cattle, poultry, and pig manure.”).

64. The construction proposed by Petitioner and Dr. Winkel defining a “liquid manure pump” as “a pump with structure capable of pumping liquid with suspended solids” also overlooks the non-Newtonian behavior of liquid manure, which differentiates the pumping characteristics of

liquid manure compared to what and produces different shear behavior and therefore the forces/loads placed on the components and bearings of a pump, which can become damaged as a result if not properly designed / validated for manure pumping applications.

65. In summary, it is my opinion that a POSITA would not have understood a “liquid manure pump” to be “a pump with structure capable of pumping liquid with suspended solids” as Dr. Winkel suggests. In my opinion, a “liquid manure pump” is “a pump with structure capable of handling the suspended solids, highly corrosive nature, and non-Newtonian behavior of liquid manure.” In my opinion, a POSITA would also understand that such a pump would be designed, tested, and/or validated to pump liquid manure and the solids therein. A POSITA would look to evidence of how a pump was designed, tested, and/or validated in determining whether the pump may properly be characterized as a “liquid manure pump.”

VII. SUPPORT FOR THE SUBSTITUTE CLAIMS

66. I previously reviewed U.S. Provisional Application No. 61/867,598 (filed August 19, 2013) (“the ‘598 Application”) (EX2081) and each of the Substitute Claims presented in the Patent Owner’s Revised Motion to Amend and offered my opinion that a POSITA would have understood that the inventors possessed the Substitute Claims as of the filing date of the ‘598 Application. I also opined that the information contained in the ‘598 Application was sufficient to inform POSITAs how to make and use the invention. In particular, in Paragraph 40 of my November 12, 2024 Declaration (EX2099), I included a chart listing the paragraphs of the ‘598 Application, which when read in conjunction with Figures 1-8 of the ‘598 Application, provide support for each of the following elements of the Substitute Claims.

67. I understand that Petitioner has challenged the sufficiency of this analysis on the grounds that I did not show where each element of the Substitute Claims is found in the applications that followed the provisional application. I disagree with the premise of Petitioner’s argument because the provisional application and subsequent applications all share substantially the same specification. To illustrate this point, I have included with this Declaration at EX2109 -

EX2114 redline comparisons between the provisional application and each of the applications in the '835 Patent's priority chain to show how each subsequent application has substantially the same specification as the provisional application. I have also included with this Declaration an updated chart at EX2108 identifying where each element of the Substitute Claims is supported in the provisional application and subsequent applications.

68. I also understand that Petitioner has challenged two elements in the Substitute Claims as lacking written description support under 35 U.S.C. § 112. I disagree with those arguments for the reasons explained below.

A. There is written description support for the language in Claims 79 and 80 requiring the pump housing of the liquid manure pump to be “mounted to the underside” of the floatable vehicle body

69. Dr. Winkel and Petitioner are wrong in stating that the specification only explains the position of the liquid manure pump and not how it is mounted. As shown in the drawings (including at least Figure 8) and explained in the specification, the liquid manure pump may be mounted to the underside of the floatable vehicle body by a “linear actuator” and/or “a lever structure of the vehicle.” EX1001, 3:5-11 and Fig. 8.

70. Figure 8 of the '835 Patent illustrates the linear actuator at element 35:

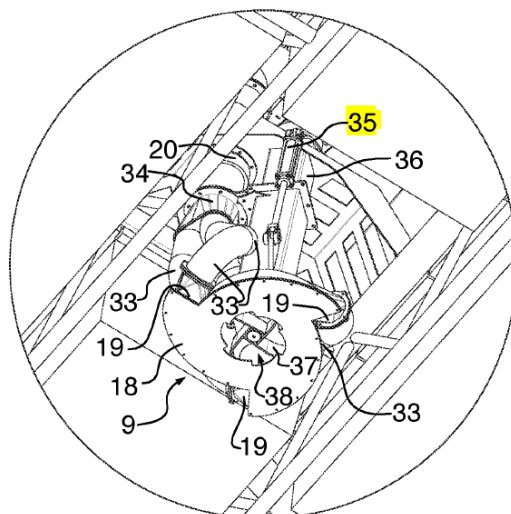


FIG.8

EX1001, 9.

71. In addition to this illustrated embodiment, the specification explains that “a lever arm structure” could be used as an alternative to the telescopic support structure shown in the illustrated embodiment:

3

outlets. A greater number of tangential fluid outlets may be provided, for example three fluid outlets. The tangential fluid outlets may be combined into a single fluid conduit for directing the combined output of the fluid pump to a desired location. The vehicle may comprise structure configured to cause raising and lowering of the fluid pump, especially the fluid pump housing, relative to the vehicle body. For example, a hydraulically or electrically driven linear actuator may be provided on the vehicle and configured to raise and lower the fluid pump. This may be accomplished via a telescoping structure or a lever structure of the vehicle. The tangential fluid outlets may be equipped with flexible or telescoping connections to the single fluid conduit. Lowering the fluid pump for immersion into the fluid obviates the need for priming the fluid pump, which can be problematic when the fluid is manure comprising solid materials that can plug the pump or priming structure. Immersion of the pump also simplifies intermittent operation of the pump, due to eliminating potential loss of prime, and reduces the need for pump maintenance.

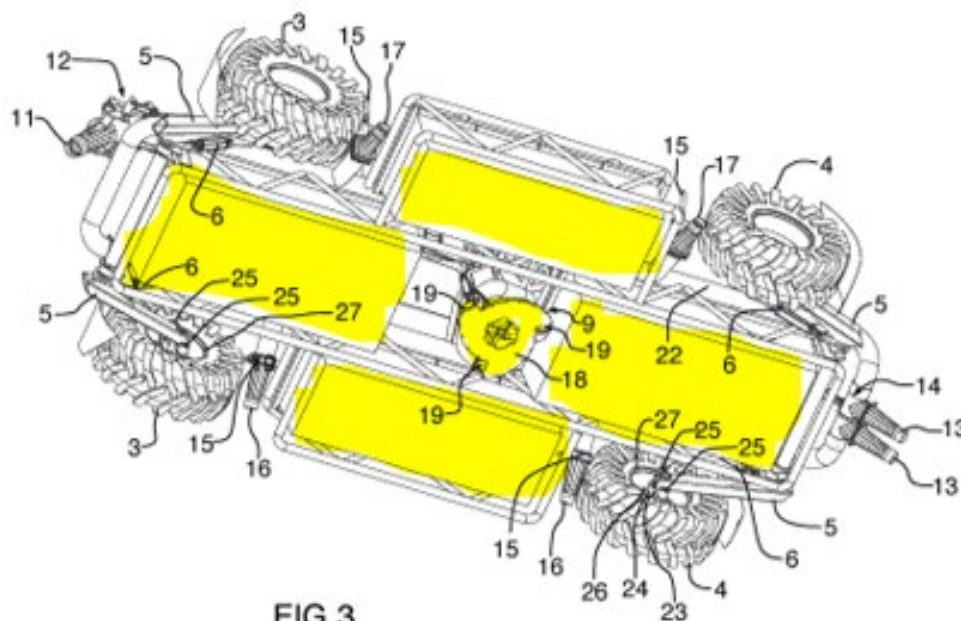
EX1001, col. 3, ln. 1-20. It is my opinion that a POSITA would have understood that this lever structure would be mounted to the underside of the floatable vehicle body, to the front, rear, or side of the pump housing, to act as a swing arm that would allow the pump to move up and down in a manner similar to the lever structures 5 that raise and lower the wheels.

72. It is therefore my opinion that the limitation of Claims 79 and 80 requiring the pump housing of the liquid manure pump to be “mounted to the underside” of the floatable vehicle body has written description support under 35 U.S.C. § 112.

B. There is written description support for the language in Claims 41, 57, 79, and 80 stating that the submerged components / portions of the

vehicle function “to keep floating solid material away from the bottom fluid opening in the pump housing”

73. Dr. Winkel and Petitioner argue that Substitute Claims 41, 57, 79, and 80 recite a negative limitation. But the language reciting that the submerged components/portion of the vehicle are positioned around the pump housing “to keep floating solid material away from the bottom fluid opening in the pump housing” does not appear to be a negative limitation because it does not describe the absence of a structural feature or the absence of a function. Rather this claim language positively recites the function that the claimed arrangement provides (i.e., the submerged components/portions of the vehicle that are positioned around the liquid manure pump act as a barrier to the floating crust). My reading of the Substitute Claims, from the viewpoint of a POSITA, is that the claimed function “to keep floating solid material away from the bottom fluid opening in the pump housing” is explicitly tied to the structure recited in the claims – the submerged components/portions of the vehicle that are positioned to the right, left, front, and rear of the pump housing. The specification clearly shows this arrangement, where portions of the frame and the buoyant elements are to the right, left, front, and rear of the pump housing of the submersible liquid manure pump.



EX1001, Fig. 3, p. 5.

74. It is therefore my opinion that the language of Substitute Claims 41, 57, 79, and 80 stating that submerged components/portions of the vehicle are positioned around the pump housing “to keep floating solid material away from the bottom fluid opening in the pump housing” has written description support under 35 U.S.C. § 112.

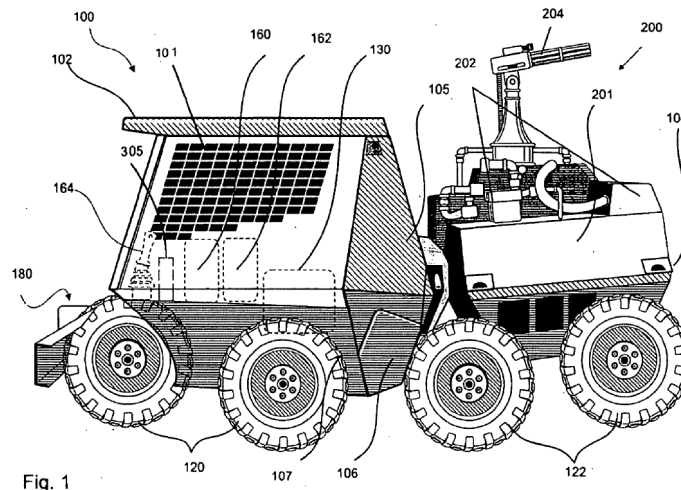
VIII. OVERVIEW OF RECORD EVIDENCE

75. In this section I describe various vehicles and pumps shown and/or described in the evidentiary record for this proceeding.

A. Carrier [EX1005]

76. Carrier teaches a general-purpose amphibious vehicle having various objectives, none of which are in nature. For example, Carrier describes one “objective is to provide a multi-purpose vehicle for National Security issues such as Sneek [sic] and Peek operations and Silent Search and Destroy Missions.” EX1005, Carrier, ¶ [0015]. “Another objective is to provide a multi-purpose vehicle for Military and National Security issues such as Explosive Energy Defeat

and Ballistic Armor Capabilities.” EX1005, Carrier, ¶ [0016]. Carrier goes on to describe that its general-purpose amphibious vehicle with eight wheels that can optionally be equipped with a water pump and water cannon for firefighting. EX1005, Carrier, ¶¶ [0060]-[0061]. In particular, Carrier states that an important feature of its vehicle is that “the tank, hoses, and pump may be readily removed from the vehicle through the use of quick-release devices.” EX1005, Carrier, ¶ [0060].



77. Carrier describes that its vehicle has an “ability to transport a pump or other device to direct the water, foam and dry chemicals at the fire, as well as decontamination solutions for decon missions.” See EX1005, Carrier, ¶ [0059]. The optional pump in Carrier is further described as “capable of pumping water from a lake or stream,” not liquid manure from a farm lagoon. See EX1005, Carrier, ¶ [0061]. Carrier does not include any description that the pump has any capabilities beyond pumping water, foam, dry chemicals at a fire, or decontamination solutions. Carrier does not state that its pump is capable of pumping liquid manure. And Carrier includes no description of the structure of its optional pump. Carrier makes no reference to manure, farm lagoons, or animal husbandry (livestock farming).

B. Truxor [EX1006]

78. Truxor describes an amphibious vehicle that is designed to carry an onboard operator and a number of different tool attachments. EX1006, Truxor, pp. 6-15. In particular, the tool attachments of Truxor includes aquatic weed cutters (EX1006, Truxor, pp. 6-7), rakes

(EX1006, Truxor, pp. 8-9), buckets and log grabbers (EX1006, Truxor, p. 9), dredge pumps (EX1006, Truxor, pp. 10-11), excavators (EX1006, Truxor, p. 12), cultivators (EX1006, Truxor, p. 13), and oil decontamination tools (EX1006, Truxor, pp. 14-15). Truxor does not describe that its vehicle or its dredge pumps are used to pump manure or are even capable of pumping manure. In fact, Truxor employs a “wheel or screw feeding” in addition to the dredging pump such that the wheel or screw feeding “gives a greater flow of sediment to the pump inlet when the sediment is soft”. EX1006, 10.



Truxor may also employ a dredge pump that “is mounted on to the lift arm which can be pressed into the sediment.” Paper 12, 25; EX1006, 11. In other words, the dredge pumps disclosed in Truxor requires that larger sized or harder suspended solids be fed through a wheel or screw feed prior to entering an inlet of the dredge pumps or be sufficiently soft, light and small in size so as to allow the “sediment to be transported long distances”. Paper 12, 25.

79. The vehicle in Truxor includes a pair of powered tracks and is advertised as being designed for weed removal and dredging. EX1006, Truxor, p. 1. Additionally, Truxor states: “Driven with care and with its minimal ground pressure, damage to river banks and sensitive areas can be 38inimized [, sic] making the *Truxor* ideal for working on golf courses, nature reserves and public parks where larger, heavier machines have difficulty operating.” EX1006, Truxor, p. 2. Truxor makes no reference to manure, farm lagoons, or animal husbandry (livestock farming).

C. SenwaTec [EX1012]

80. Like Truxor, SenwaTec discloses an amphibious vehicle that is designed to carry an onboard operator and a number of different tool attachments. EX1012, SenwaTec, p. 2. For example, SenwaTec's tool attachments include hydraulic augers, tree cutters, clearing and collecting rakes, t-cutter bars, mowing buckets, excavating buckets, suction augers, and centrifugal pumps. EX1012, SenwaTec, pp. 2-3. SenwaTec's marketing material does not describe that its vehicle or its centrifugal pumps are used to pump manure or are even capable of pumping manure.

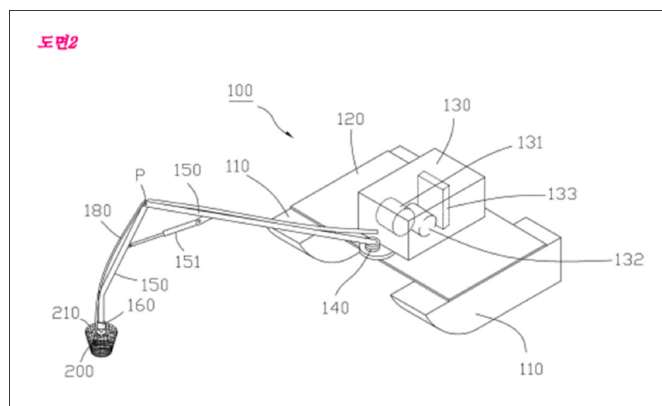


EX1012, SenwaTec, p. 2.

81. Two different drivetrain configurations are advertised in SenwaTec, one being an amphibious vehicle with six wheels and the other being an amphibious vehicle with tracks. EX1012, pp. 1-2. The vehicle in SenwaTec is advertised as being designed for weed removal and dredging. EX1012, SenwaTec, p. 1. SenwaTec makes no reference to manure, farm lagoons, or animal husbandry (livestock farming).

D. Yoon [EX1010 and EX1011]

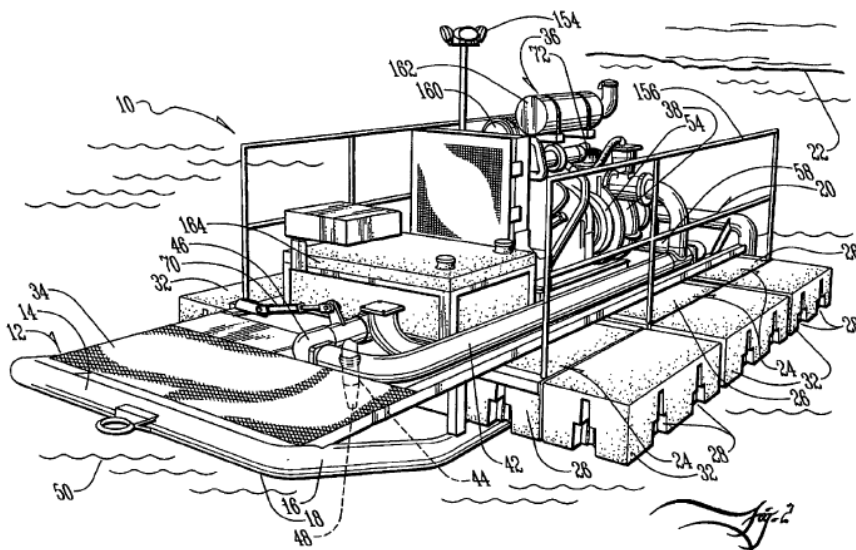
82. A POSITA would understand Yoon for generally disclosing a remote control vehicle with a water pump. Yoon describes a remote-controlled vehicle with an onboard water pump 131:



83. Yoon describes that its “invention is about an amphibious water treatment device that is installed at streams or on storage tanks, reservoirs, and so on, into which waste materials are dumped in order to treat industrial waste materials.” EX1011, Yoon, ¶ [0001]. Yoon includes a main body 130 in which a water pump 131 is installed. EX1011, Yoon, ¶ [0047]. The water pump 131 of Yoon is not immersed in the storage tank or reservoir. Yoon’s water pump 131 pumps wastewater and sludge from the storage tank or reservoir and into a water collection device 300, where it is “separated into wastewater and sludge.” EX1011, Yoon, ¶ [0070]. Then, “the sludge separated from the stored water is collected by a sludge transportation car, which is not illustrated, and then treated.” EX1011, Yoon, ¶ [0077]. Yoon only includes a generalized statement that “a remote receptor (not illustrated) is installed on the controller (133) installed on the main body (130) in order for the operator to control work using a remote controller from the land.” EX1011, Yoon, ¶ [0048]. However, other than this generalized statement, Yoon provides no details as to how its remote control is designed or implemented. A POSITA would understand from Yoon that its water pump would clog if used to pump liquid manure, which is also consistent with Bazooka’s public statements that “most pumps cannot operate” in liquid manure. Accordingly, a POSITA would also understand from Yoon that a pump requiring a “sludge filtering device” is not a pump that pumps liquid manure because the “sludge filtering device” would filter out suspended solids contained in liquid manure.

E. Puck [EX1014]

84. Puck teaches a traditional manure agitation boat that must be launched and retrieved using a trailer:

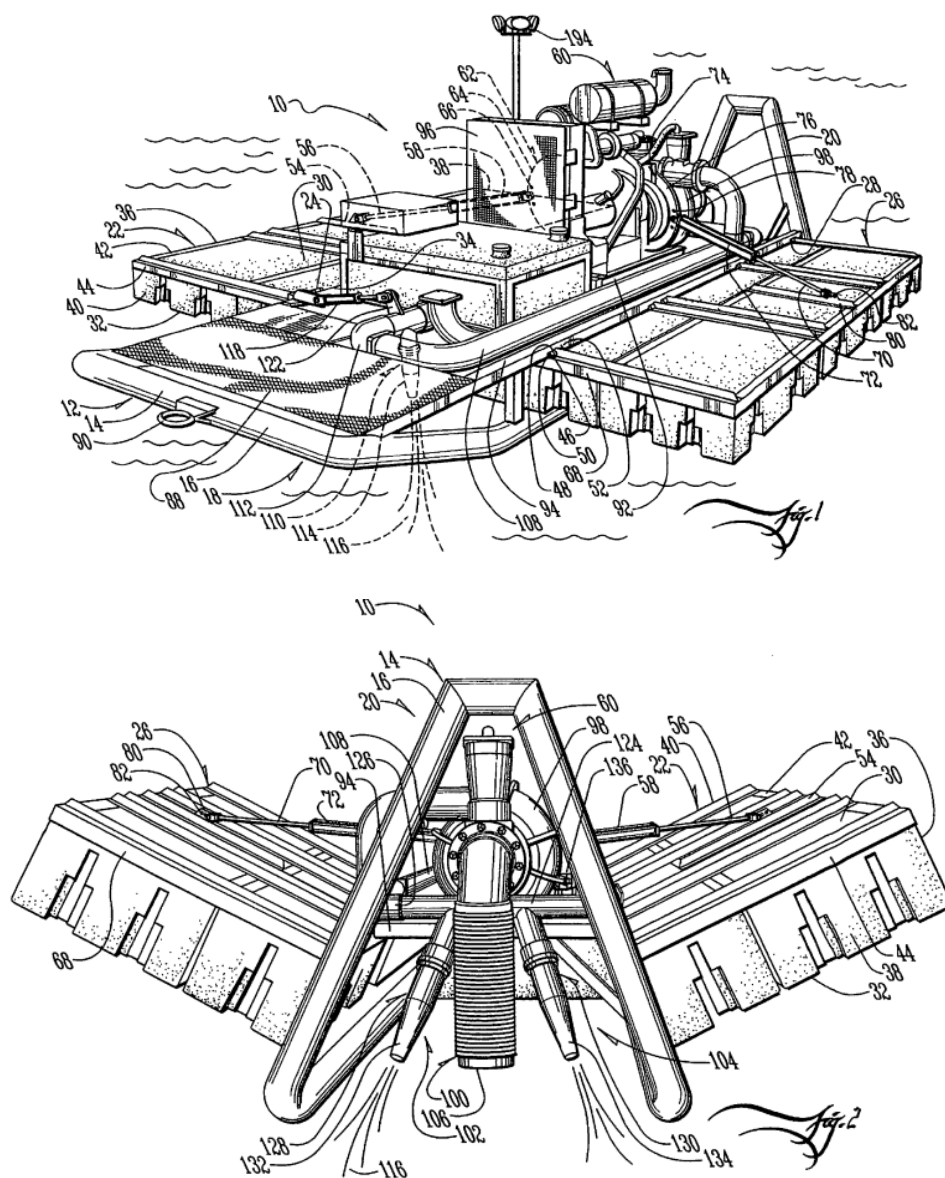


EX1014, Puck, p. 3, FIG. 2.

85. Puck describes that its vessel 12 includes modular dock sections 26. EX1014, Puck, Paras. [0022]-[0023]. Puck describes that it includes a slurry pump 38, which is a Cornell Redi-Prime centrifugal pump. EX1014, Puck, ¶ [0025]. Puck describes that the “slurry pump (38) is coupled to a liquid manure intake, such as a slurry intake, which is a downwardly directed intake pipe (40)” and that the “intake pipe (40) is constructed to extend about twenty-four inches below the surface of the lagoon (22).” EX1014, Puck, ¶ [0026]. Figures 1, 2, 6, and 8 of Puck show the slurry pump 38 with only a single inlet and a single outlet. EX1014, Puck, pp. 2, 3, 7, and 9. Figure 4 of Puck shows the slurry pump 38 above the manure lagoon 22 and above the crust 126. EX1014, Puck, p. 5. Puck does not include any ground engaging propulsion structure. Instead, Puck’s agitation boat is “transported to the manure lagoon (22) using a trailer (132) and pulling vehicle (134).” EX1014, Puck, ¶ [0034]. Puck includes a remote control system 64, but because Puck lacks a ground engaging propulsion structure, Puck does not include any description that its remote control system 64 can control a ground engaging propulsion structure.

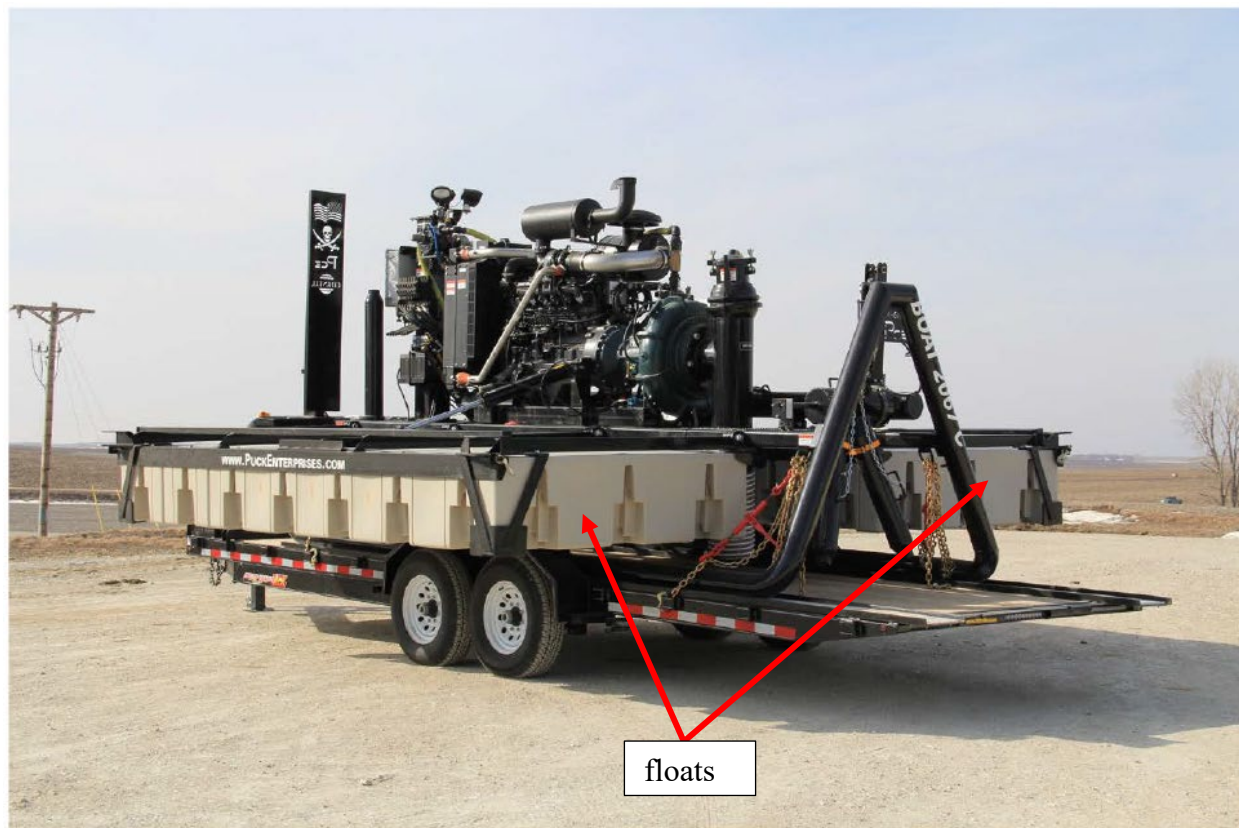
F. The Puck Boat [EX1121-EX1126], [EX1160-EX1161], and [EX1163-EX1168]

86. The Puck Boat is a manure agitation boat and the commercial embodiment of the vehicle described in U.S. Publication No. 2013/0145980 (EX2107, Puck II).



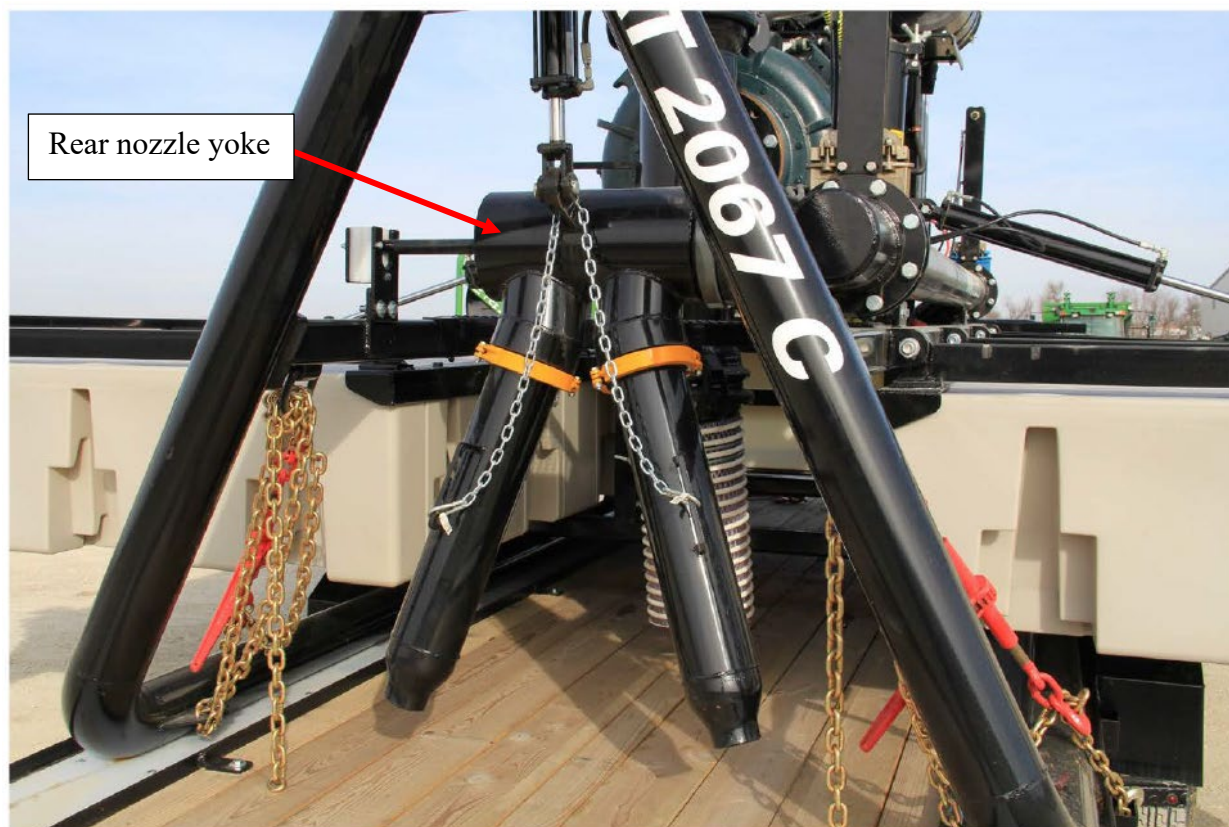
EX2107, Puck II, pp. 2-3, FIGS. 1-2.

The Puck Boat, which is depicted and described in a collection of photographs, videos, and documents filed in the record at EX1121-EX1126, EX1160-EX1161, and EX1163-EX1168, and discussed in the declaration and deposition transcript of Mr. Puck at EX1121 and EX1158, has hydraulically folding floats that are deployed when the boat is being launched into a manure lagoon:



EX1164, p. 32.

87. The Puck Boat has a Cornell Redi-Prime centrifugal pump that is installed on the Puck Boat above the floats and therefore above surface of the manure lagoon. The pump is coupled to a downwardly directed intake pipe that extends below the surface of a manure lagoon. Unlike in Puck II, where the rear nozzle yolk 124 is positioned forward of the downwardly directed intake pipe 100, the rear nozzle yolk on the Puck Boat (i.e., the commercial embodiment) is positioned behind the downwardly directed intake pipe near the rear “A” frame structure.



EX1164, p. 41.

G. The Puck Prototype [EX1120]

88. The Puck Prototype, which is depicted and described in a collection of photographs filed in the record at EX1159 and discussed in the deposition transcript of Mr. Puck at EX1158, was designed to be pulled across a manure lagoon using another vehicle and guide wires / cables, which can be seen in the image reproduced below:



EX1159, p. 5.

89. The Puck Prototype included two submersible, boom-mounted pumps positioned on the right and left sides of the floating barge:

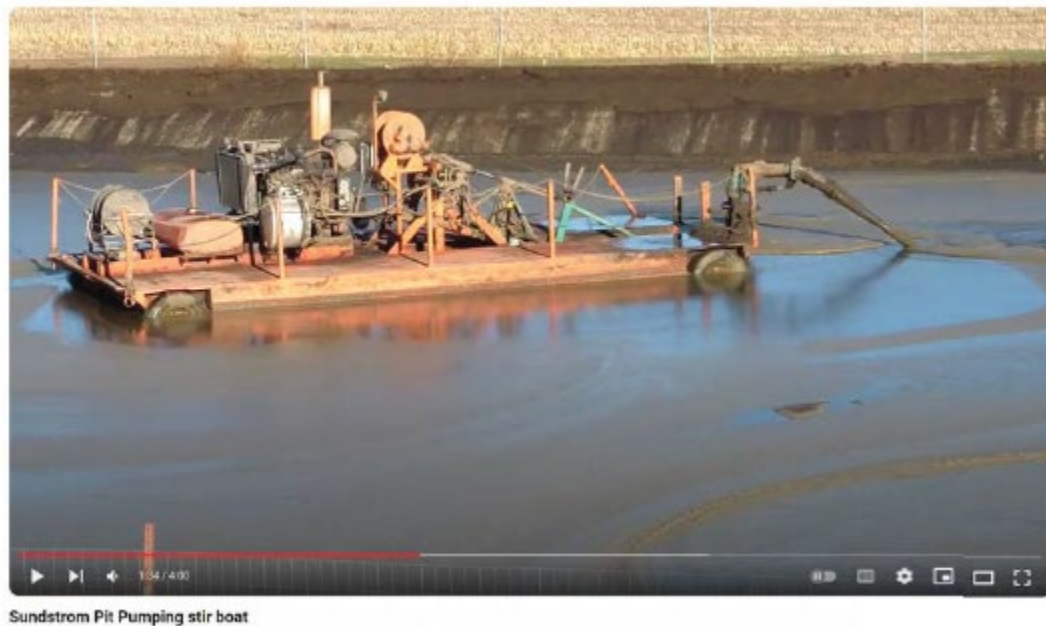


EX1159, p. 3.

As shown in the photographs above, the submersible pumps are mounted on the far end of a boom arm that can tilt/swing up and down and be lowered into and out of the manure lagoon. In the lowered operating position, the submersible pumps on the end of the boom arms are spaced far below the bottom of the barge by a distance that appears to be on the order of several feet.

H. Sundstrom [EX1120]

90. Sundstrom [EX1120] depicts a floating manure agitator that is designed to be pulled across a manure lagoon using one or more cables and winches, which can be seen along the top of the vehicle in the images reproduced below:



EX1120, Sunstrom, p. 10.

91. The Sundstrom manure agitator includes a liquid manure pump and nozzle/cannon assembly that are mounted on the far end of a boom arm that can tilt up and down to a limited degree. In accordance with this arrangement, the liquid manure pump on the end of this boom arm hangs off the front of Sunstrom's barge by a distance that appears to be on the order of several feet:



EX1120, Sunstrom, p. 11.

I. Manure-Manager [EX1112]

92. Manure-Manager (EX1112) is an industry publication (i.e., a trade magazine) from January/February 2011 that includes an advertisement for Nuhn's "G-Force" a tractor mounted / tractor powered manure lagoon agitation pump assembly ("Nuhn's Pit Pump"), which includes an impeller and pump housing located on the far end of the boom arm while the other end of the boom arm is connected to the rear hitch of a farm tractor:

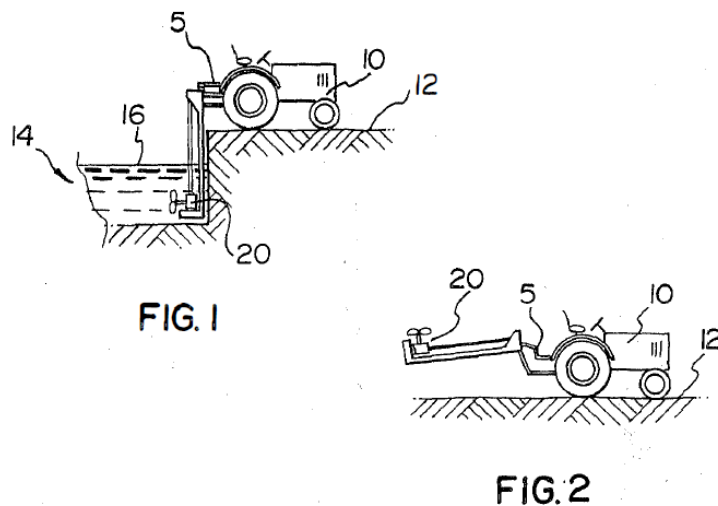


EX1112, p. 27.

The boom arm on Nuhn's Pit Pump is about 10 feet in length and the pump impeller is driven by the PTO of the tractor through a gearbox assembly in the boom arm. Similar boom mounted, tractor driven pumps are also cited on the face of the '835 Patent, including Houle (EX2010) and Depault (EX2017).

J. Houle [EX2010]

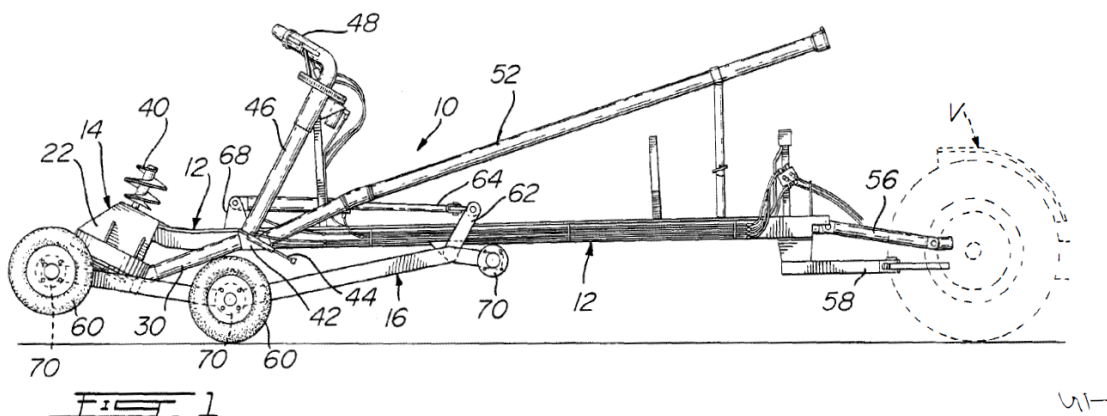
93. US 4,406,413 to Houle (EX2010) discloses a tractor mounted / tractor powered manure lagoon agitation pump 20 that is mounted on the end of a boom arm. The manure agitation pump 20 is located on the far end of the boom arm while the other end of the boom arm is connected to the rear hitch 5 of a farm tractor 10:



EX2010, FIGS. 1-2.

K. Depault [EX2017]

94. CA2002619A1 to Depault (EX2017) discloses a tractor mounted / tractor powered manure lagoon agitation pump 14 that is mounted on the end of a boom arm 12. The manure agitation pump 14 is located on the far end of the boom arm 12 while the other end of the boom

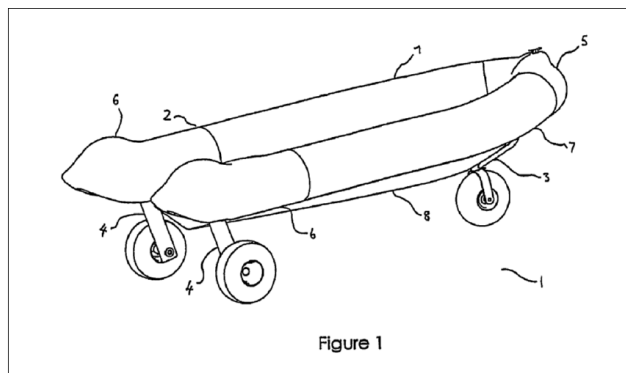


arm is connected to the rear hitch of a tractor V:

EX2017, FIG. 1.

L. Bryham [EX1015]

95. Bryham describes a three-wheeled land propulsion and steering system that retracts into and extends out from a boat hull:



EX1015, Bryham, p. 2.

96. Bryham’s vee-boat hull boat, with its three wheels (one at the bow and two at the stern), is designed for operation in lakes and other bodies of water. In one embodiment, Bryham describes its boat as an “inflatable craft 2, fitted with a single nose undercarriage assembly 3 and two aft undercarriage assemblies 4, providing means for the craft to travel over land.” EX1015, Bryham, p. 22, col. 11, ln. 56-59. Bryham also states that its craft includes fiberglass cowlings “towards the front of the craft and towards the rear 6,” that the “cowlings are shaped to conform to the lines of the inflatable tubes 7,” and that the undercarriage assemblies 3 and 4 can be “retracted and stowed within the cowlings 5 & 6.” EX1015, Bryham, p. 22, col. 11, ln. 59 – col. 12, ln. 4. Bryham does not describe any sort of remote control. Nor does Bryham makes any reference to manure, farm lagoons, or animal husbandry (livestock farming).

M. Bennett-II [EX1017]

97. Bennett-II describes a general-purpose amphibious vehicle that has a pair of tracks:

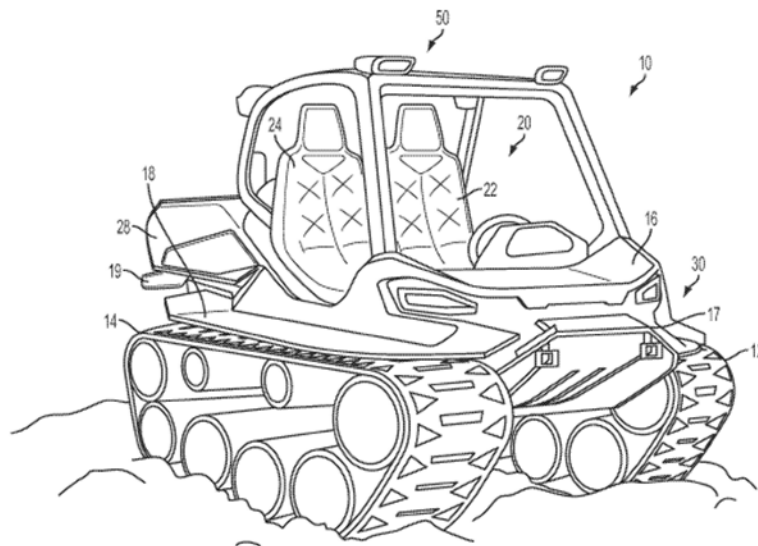


FIG. 1

EX1017, Bennett-II, p. 2.

98. Bennett-II describes that its vehicle 10 has a pair of tracks 12, 14 that are driven by two drive units 590, 592 through a transmission 550 that is powered by an engine 502:

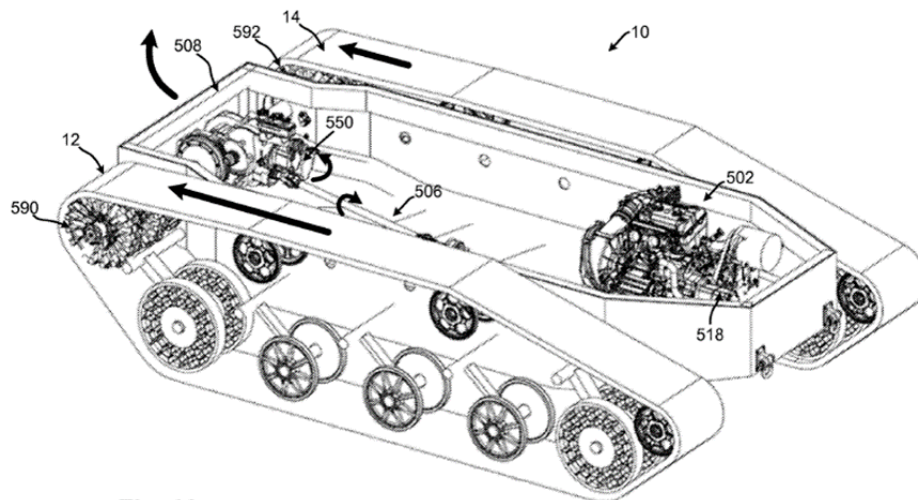


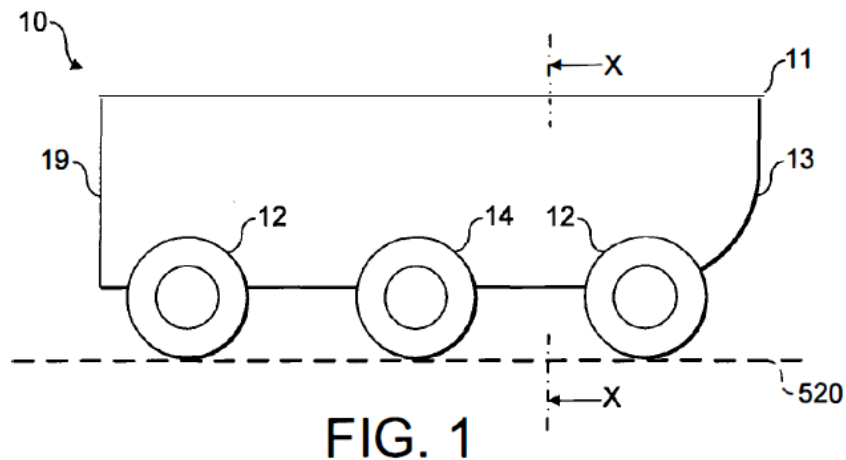
Fig. 16

EX1017, Bennett-II, p. 22, Paras. [0048], [0077]. Bennett-II only includes generalized statements that its “vehicle 10 may be operated by remote control” and in “one embodiment, vehicle 10 is adapted to be remotely controlled. For example, a remote control electronic device may be used to control vehicle 10 wirelessly without an operator being positioned in the vehicle 10.” EX1017,

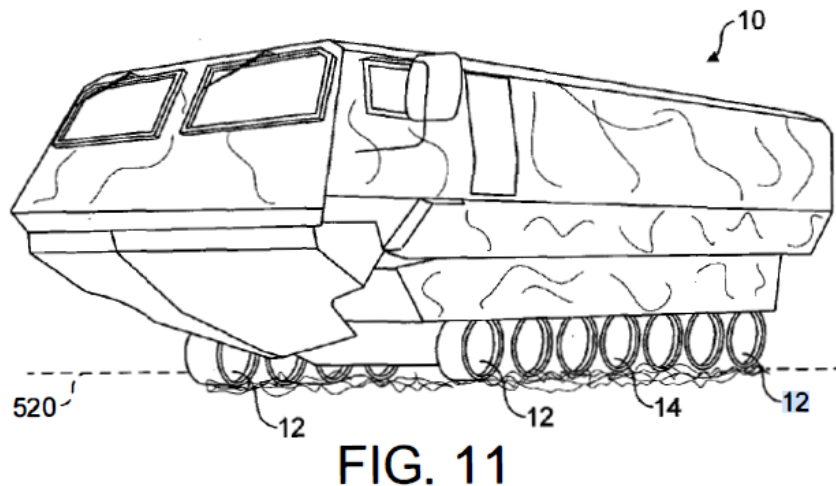
Bennett-II, Paras. [0043], [0121]. Other than these generalized statements, Bennett-II provides no details as to how its remote control is designed or implemented. Additionally, Bennett-II makes no reference to manure, farm lagoons, or animal husbandry (livestock farming).

N. Bailey [EX2084]

99. Bailey describes a general-purpose amphibious vehicle that six or more retractable wheels:



EX2084, Bailey, p. 2.



EX2084, Bailey, p. 5.

100. Bailey's "Background" section explains that multiple axle off-road vehicles with 3

or more sets of wheels (i.e., 6 or more wheels) have many advantages over vehicles with 2 axles (i.e., 4 wheels) in off-road and amphibious vehicle applications. EX2084, Baily, Paras. [0001]-[0007].

IX. SUBSTITUTE CLAIMS 41-80 ARE PATENTABLE OVER THE CITED ART

101. I have reviewed the Substitute Claims submitted with Patent Owner's Revised Motion to Amend, the prior art cited in this IPR, the prior art considered during prosecution of the '835 Patent, and the prior art cited in the IPRs Petitioner filed against Nuhn's '425 Patent (IPR2023-01161) and Nuhn's '708 Patent (IPR2024-00098). After reviewing the Substitute Claims, it is my opinion that the prior art I have reviewed, and have personal knowledge of, does not anticipate or render obvious the Substitute Claims.

102. There are a total of forty (40) Substitute Claims with Claims 41, 57, 79, and 80 being written in independent form. My analysis below focuses on the four Substitute Claims that are independent, which are shown in the comparison chart presented below:

Substitute Claim 41	Substitute Claim 57	Substitute Claim 79	Substitute Claim 80
41. An amphibious vehicle, comprising:	57. An amphibious vehicle, comprising:	79. An amphibious vehicle, comprising:	80. An amphibious vehicle, comprising:
a floatable vehicle body with a front, a rear, an underside and a longitudinal centerline;	a floatable vehicle body with a front, a rear, an underside and a longitudinal centerline;	a floatable vehicle body with a front, a rear, and an underside;	a floatable vehicle body with a front, a rear, and an underside;
a ground engaging propulsion structure comprising a plurality of ground engaging elements powered by at least one hydraulic motor;	a ground engaging propulsion structure comprising a plurality of ground engaging elements powered by at least one hydraulic motor;	a ground engaging propulsion structure comprising a set of four ground engaging wheels and wherein each ground engaging wheel is powered by its own variable	a ground engaging propulsion structure comprising a front set of ground engaging wheels at the front of the floatable vehicle body and a rear set of ground engaging wheels at the rear of

		speed hydraulic motor;	the floatable vehicle body and wherein each ground engaging wheel is powered by its own variable speed hydraulic motor;
a hydraulically powered liquid manure mover separate from the ground engaging propulsion structure, [I] the liquid manure mover including an immersible liquid manure pump that is hydraulically powered, at least one fluid conduit, and at least one fluid nozzle, [II] the immersible liquid manure pump of the liquid manure mover including a substantially vertical drive shaft powering an impeller that is positioned in a pump housing and draws liquid manure in through a bottom fluid opening in the pump housing, [V] the pump housing and the impeller of the immersible liquid manure pump are positioned along the underside of the floatable vehicle body at a location	a hydraulically powered liquid manure mover separate from the ground engaging propulsion structure, [I] the liquid manure mover including an immersible liquid manure pump that is hydraulically powered, at least one fluid conduit, and at least one fluid nozzle, [II] the immersible liquid manure pump of the liquid manure mover including a substantially vertical drive shaft powering an impeller that is positioned in a pump housing, the immersible liquid manure pump including a bottom fluid opening in the pump housing, [V] where the pump housing and the impeller are positioned along the underside of the floatable vehicle body at a location	a hydraulically powered liquid manure mover separate from the ground engaging propulsion structure, [I] the liquid manure mover including an immersible liquid manure pump that is hydraulically powered, at least one fluid conduit, and at least one fluid nozzle, [II] the immersible liquid manure pump of the liquid manure mover including a pump housing and an impeller that is driven by a substantially vertical drive shaft, the immersible liquid manure pump including a bottom fluid opening in the pump housing, [V] where the pump housing is mounted to the underside of the floatable vehicle body [VI] in a space collectively defined between the four ground engaging	a hydraulically powered liquid manure mover separate from the ground engaging propulsion structure, [I] the liquid manure mover including an immersible liquid manure pump that is hydraulically powered, at least one fluid conduit, and at least one fluid nozzle, [II] the immersible liquid manure pump of the liquid manure mover including a drive shaft powering an impeller that is positioned in a pump housing and draws liquid manure in through a bottom fluid opening in the pump housing, [V] the pump housing is mounted to the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of

that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body [III] such that the immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating [IV] and has a constant angular orientation relative to the floatable vehicle body;	that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body [III] such that the immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating in a manure lagoon [IV] and has a constant angular orientation relative to the floatable vehicle body;	wheels such that the pump housing is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body [III] and such that immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating [IV] and has a constant angular orientation relative to the floatable vehicle body;	the rear of the floatable vehicle body [III] such that the immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating in a manure lagoon, [II] where the drive shaft is substantially vertical [IV] and has a constant angular orientation relative to the floatable vehicle body;
a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the liquid manure mover; and	a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the liquid manure mover; and	a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the liquid manure mover; and	a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the liquid manure mover; and
a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion structure; (2) control a flow of liquid manure from the immersible liquid manure	a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion structure; (2) control the flow of liquid manure from the liquid manure mover back into the	a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion structure; (2) control a flow of liquid manure from the liquid manure pump; (3) control at	a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion structure; (2) control a flow of liquid manure from the liquid manure mover; (3) control

pump; (3) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and (4) control at least one of the speed and direction of the vehicle when the vehicle is floating,	manure lagoon; (3) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and (4) control at least one of the speed and direction of the vehicle when the vehicle is floating,	least one of the speed and direction of the vehicle when the vehicle is ground engaging; and (4) control at least one of the speed and direction of the vehicle when the vehicle is floating,	at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and (4) control at least one of the speed and direction of the vehicle when the vehicle is floating,
[VII] wherein components of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump.	[VII] wherein portions of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to the right and left of the pump housing and are spaced from and positioned forward of and rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump.	[VII] wherein portions of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump.	[VII] wherein components of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to the right and left of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump.

103. I have annotated various limitations / elements of the above claims using color coding and bracketed Roman Numerals to identify Distinguishable Elements [I] – [VII], which I reference in my discussion below.

104. Distinguishable Element [I], which is present in Substitute Claims 41, 57, 79, and 80, explicitly defines the “liquid manure mover” as “including an immersible liquid manure pump that is hydraulically powered, at least one fluid conduit, and at least one fluid nozzle.”

105. Distinguishable Element [II], which is present in Substitute Claims 41, 57, 79, and 80, specifies that the immersible liquid manure pump includes “a substantially vertical drive shaft powering an impeller” and “a bottom fluid opening in the pump housing.”

106. Distinguishable Element [III], which is present in Substitute Claims 41, 57, 79, and 80, specifies that “the immersible liquid manure pump is positioned within liquid manure when the vehicle is floating.”

107. Distinguishable Element [IV], which is present in Substitute Claims 41, 57, 79, and 80, specifies that the immersible liquid manure pump / the drive shaft of the immersible liquid manure pump “has a constant angular orientation relative to the floatable vehicle body.”

108. Distinguishable Element [V], which is present in Substitute Claims 41, 57, 79, and 80, specifies that the immersible liquid manure pump includes a housing that is positioned along or mounted to “the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body.”

109. Distinguishable Element [VI], which is present in Substitute Claim 79, further specifies that the pump housing is mounted to the underside of the floatable vehicle body “in a space collectively defined between the four ground engaging wheels.”

110. Distinguishable Element [VII], which is present in Substitute Claims 41, 57, 79, and 80, specifies that “components/portion of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side / to the right and left of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing ... to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump.”

111. In my opinion, the prior art fails to disclose each and every limitation of Substitute

Claims 41, 57, 79, and 80 (listed above) because, the prior art, whether considered alone or in combination, fails to disclose the claimed combinations of Distinguishable Elements [I] – [VII].

112. Substitute Claims 42-56 depend from Substitute Claim 41 and are patentable at least due to their dependency from Substitute Claim 41. Substitute Claims 58-77 depend from Substitute Claim 57 and are patentable at least due to their dependency from Substitute Claim 57.

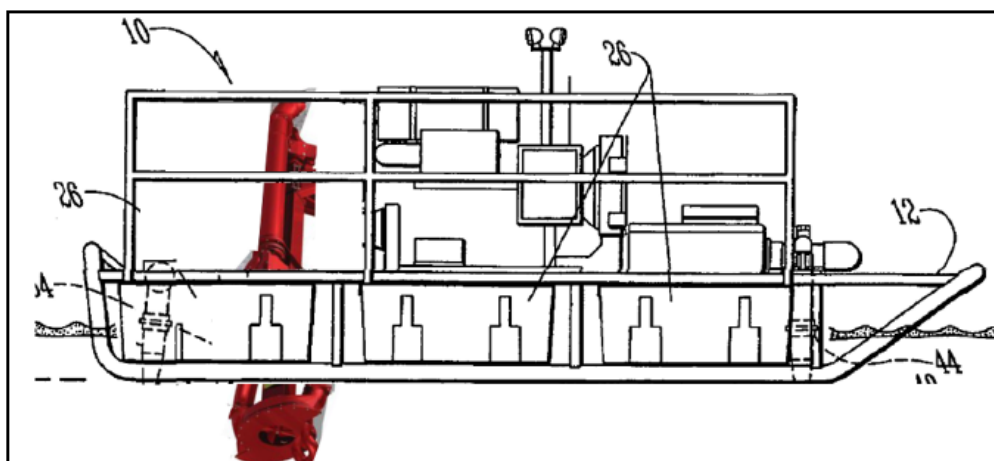
113. The prior art does not teach an amphibious vehicle for agitating / mixing manure lagoons that combines a floatable vehicle body, hydraulically powered wheels, a hydraulically powered immersible liquid manure pump that is connected to a nozzle by a conduit (Distinguishable Element [I]), where the liquid manure pump is mounted in the position and orientation recited in Distinguishable Elements [II] – [VII].

114. I disagree that a POSITA would patch the prior art together in the manner Dr. Winkel and Petitioner suggest without using the '835 Patent claims as a blueprint. But even if a POSITA were to combine the prior art as Dr. Winkel and Petitioner suggest, the resulting combination still does not yield a machine with the liquid manure pump placement and orientation described in the Substitute Claims (i.e., where (1) the immersible liquid manure pump is hydraulically powered, has a bottom fluid opening in the pump housing, is positioned along the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body, is immersed in the liquid manure when the vehicle is floating, has a substantially vertically oriented drive shaft, and has a constant angular orientation relative to the floatable vehicle body, and (2) components/portion of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side / to the right and left of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump.

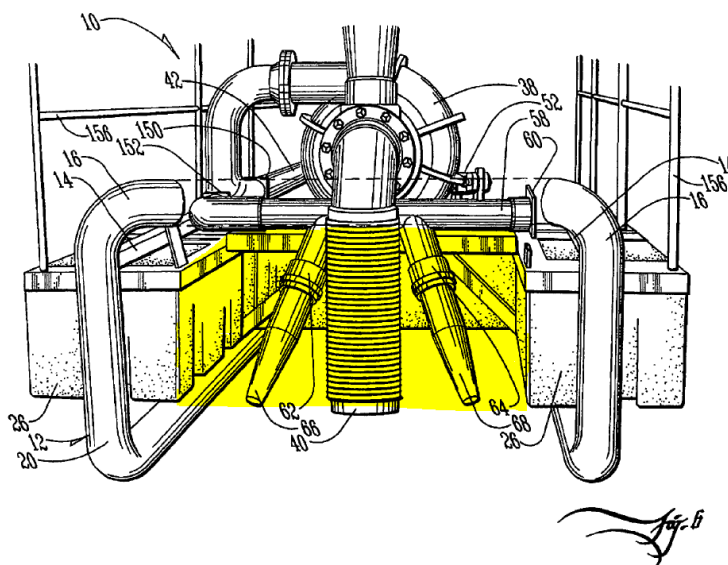
115. The ubiquitous teachings of the prior art suggest locating the pump high and dry inside or on top of the vehicle body (like in Carrier, Yoon, and Puck) or placing a submersible

pump at the far end of a boom arm (like in Truxor, SenwaTec, Sundstrom, Manure-Manager, Houle, and Depault). The prior art does not teach or suggest the claimed arrangement where the immersible liquid manure pump has a pump housing that is positioned along / mounted to the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body. Nor does the prior art teach or suggest a vehicle where the immersible liquid manure pump has a substantially vertical drive shaft, a bottom fluid opening in the pump housing, and a constant angular orientation relative to the floatable vehicle body. Indeed, the submersible pumps disclosed in Truxor, SenwaTec, Sundstrom, Manure-Manager, Houle, and Depault are all boom mounted and therefore do not have a constant angular orientation relative to the floatable vehicle body. Any combination of these references with Puck and/or Bryham by a POSITA would have resulted in a vehicle with a boom mounted pump that could swing up and down, which is precisely what Sundstrom discloses. Absent impermissible hindsight bias, a POSITA would not mount any of these boom-mounted, submersible pumps in a central location (i.e., rearward of the front and forward of the rear of the vehicle) along the underside of Puck's boat, with a vertical drive shaft, and a constant angular orientation, as required by the Substitute Claims.

116. Even if, for argument's sake, a combination were made where Nuhn's Pit Pump is fitted in the manner Dr. Winkel and Petitioner suggest, as shown below, the resulting vehicle still lacks the claimed configuration.



Distinguishable Element [VII] states that components / portions of the vehicle that are submerged when the vehicle is floating are: (1) spaced from and positioned to each side of the pump housing, and (2) spaced from and positioned directly forward of and directly rearward of the pump housing, to form a protective perimeter that functions to keep floating solid material away from the immersible liquid manure pump. As shown in Fig. 6 of Puck (reproduced below), placement of Nuhn's Pit Pump in this U-shaped opening at the rear of Puck's boat, between the floating dock sections 26, would still result in a vehicle where no submerged component or portion of the vehicle is spaced from and positioned directly rearward of the pump housing, as required by Distinguishable Element [VII].



EX1014, Fig. 6, p. 7. In other words, even if a POSITA made the Puck, Bryham, Manure-Manager combination in the manner in which Petitioner suggests, there would be no submerged structure directly behind the pump housing that would keep/block floating solid material (i.e., crust) from floating into the U-shaped opening in the rear of Puck's boat, where it could clog the immersible liquid manure pump. As will be explained in further detail below, the addition of the Puck Boat, and its placement of the rear nozzle yoke, does not correct this deficiency for a variety of reasons, including that the rear nozzle yoke cannot reasonably be considered a "submersed component" or portion of the vehicle.

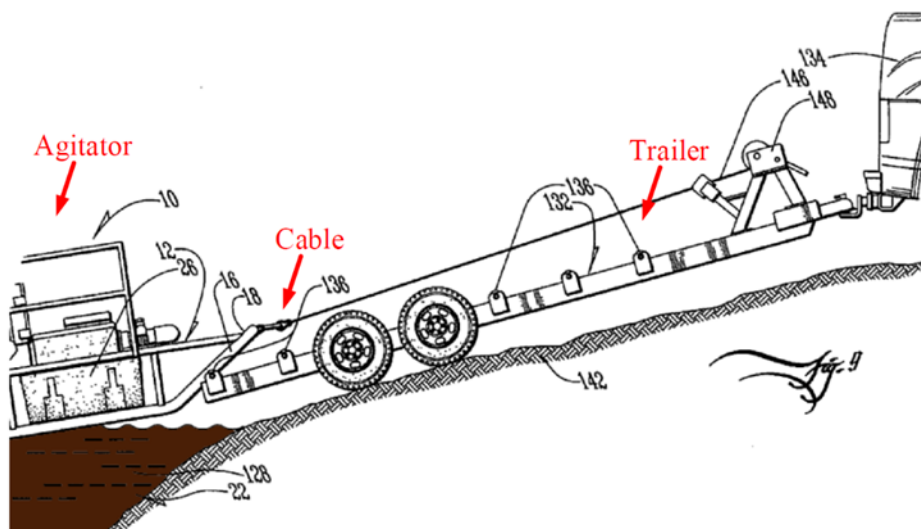
117. The differences between the prior art and Distinguishable Elements [I] – [VII] are not immaterial. The particular arrangements claimed (where (1) the immersible liquid manure pump is hydraulically powered, has a bottom fluid opening in the pump housing, is positioned along the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body, is immersed in the liquid manure when the vehicle is floating, has a substantially vertically oriented drive shaft, and has a constant angular orientation relative to the floatable vehicle body, and (2) components/portion of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side / to the right and left of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump) directly contribute to the new and unexpected results and commercial success experienced by Nuhn's invention. The particular arrangement of the elements recited in the Substitute Claims results in an amphibious vehicle where the position of the liquid manure pump along the underside of the floatable vehicle body and the churning action of the ground engaging elements work together in synergy to breakup thick crust around the vehicle, generating a working pocket or opening within which the liquid manure pump can operate without clogging. Placing the claimed

elements elsewhere would destroy this synergy, which depends on the specific location of the liquid manure pump as claimed.

X. A POSITA WOULD NOT HAVE BEEN MOTIVATED TO ARRIVE AT PETITIONER’S COMBINATION OF PUCK, THE PUCK BOAT, BRYHAM, AND MANURE-MANAGER

118. In my opinion, a POSITA would not have been motivated to combine Bryham with Puck, the Puck Boat, and Manure-Manager. Dr. Winkel incorrectly asserts that a POSITA would have been motivated to combine the teachings of Puck with the teachings of Bryham “to make the process of launching and retrieving the Puck boat from the manure lagoon safer and easier without having to place a trailer or one’s feet into the hazardous and corrosive manure lagoon.” EX1004, Winkel Decl., ¶331. Neither of these reasons/flaws in Puck’s design are actually supported by Puck’s disclosure.

119. As shown in the annotated image below from Paragraph 332 of the Winkel Declaration, Puck actually discloses a system where the manure agitation boat can be launched and retrieved without backing the trailer into the manure lagoon:



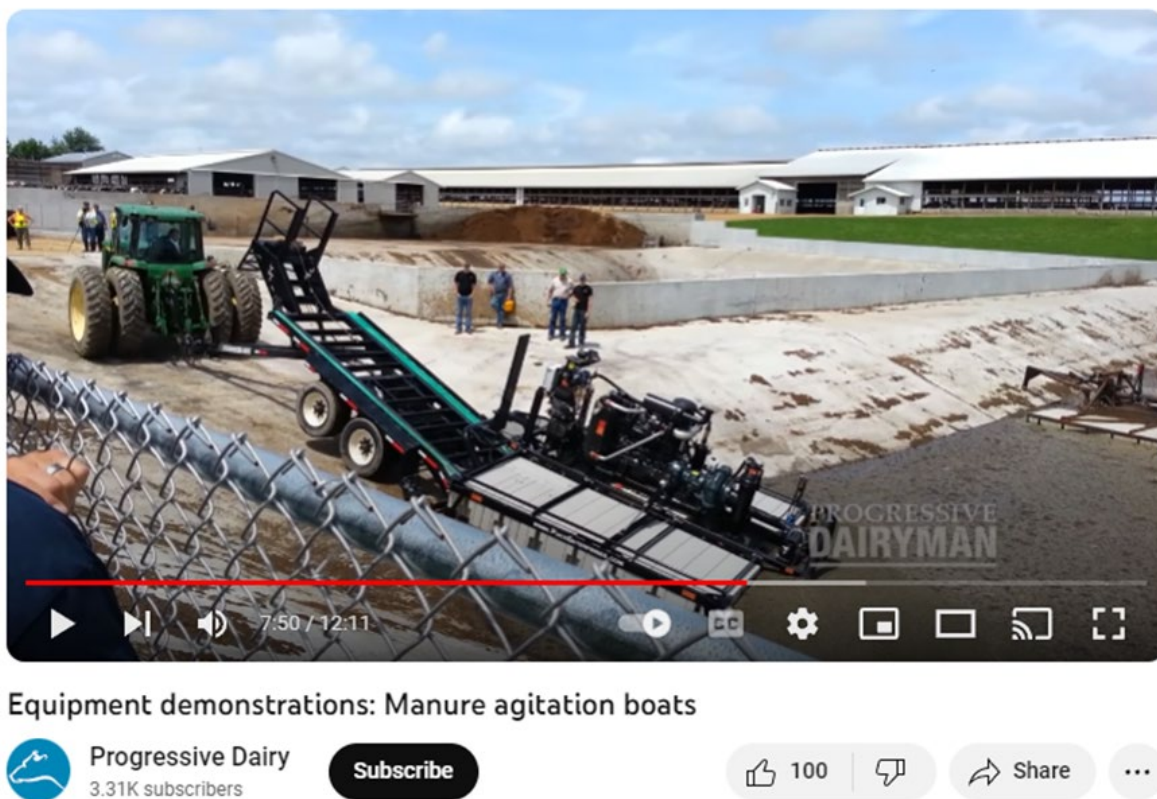
(*Id.*, FIG. 9 (annotated).)

EX1004, Winkel Decl., ¶332.

120. A POSITA would recognize that the process of launching and retrieving Puck’s

boat does not require placing “a trailer or one’s feet into the hazardous and corrosive manure lagoon” as Dr. Winkel incorrectly argues. Indeed, nothing of the sort is shown or described in Puck’s disclosure. Rather Puck describes that “the agitator (10) may roll off the trailer (132) by the force of gravity or may be manually pushed from the trailer (132) into the lagoon” and that the “trailer (132) may be fitted with a plurality of rollers (136) to facilitate the removal of the agitator (10) from the trailer (132). EX1014 at ¶ [0034]. At no point does Puck describe a person needing to go near the lagoon to launch or retrieve Puck’s boat.

121. My opinion in this regard is further informed by the manure boat demonstration video published by Progressive Dairyman (EX2008), where neither the trailer nor the operator is shown entering the lagoon when Puck’s boat is launched in the video:



EX2008, p. 7.

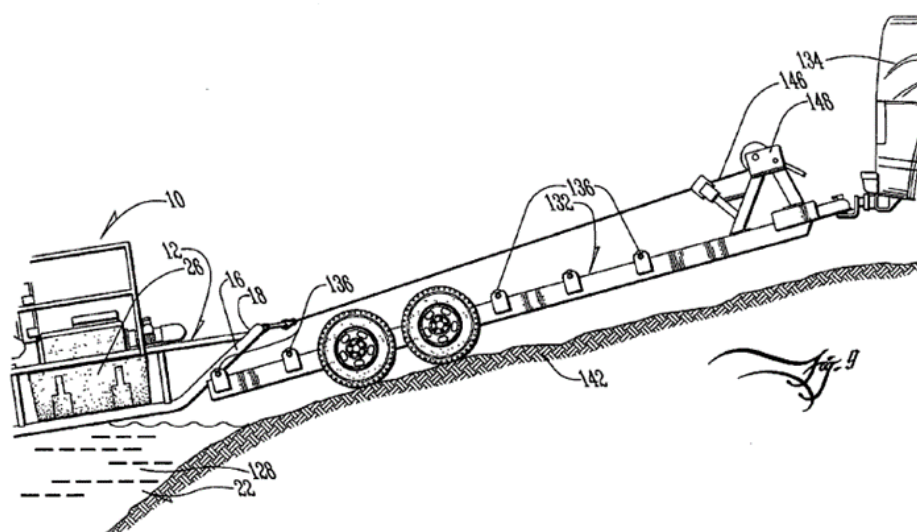
122. In my opinion, POSITA would not have seen any problem with Puck’s design in the first place that would have led them to look for the Bryham reference.

123. Dr. Winkel points to Bryham as identifying alleged difficulties and problems with launching and retrieving boats that would have led a POSITA to combine Bryham with Puck. In particular, Dr. Winkel asserts that “Bryham explains ‘that when there is no jetty or wharf in the area in which the boat is to be landed, then at least one of the occupants of the boat usually needs to get their feet wet.’” EX1004, Winkel Decl. ¶ 333 (citing EX1015 at col. 1, ln. 18-21). Dr. Winkel alleges that this is pertinent to manure lagoon applications. *Id.* But Dr. Winkel ignores that Bryham refers to an “occupant of the boat” that must exit the boat, get into the water, and assist the boat out of the water. In Puck’s boat, *there is no occupant*. Without an occupant on Puck’s boat, that non-existent occupant does not have to get into the manure lagoon to assist Puck’s boat out of the manure lagoon. Likewise, without needing to have an occupant on Puck’s boat once it is launched into the manure lagoon, a user does not have to enter the manure lagoon to get onto Puck’s boat. Therefore, the problems attempted to be solved by Bryham do not exist for Puck’s boat. As such, without such problems existing for Puck, no POSITA would have combined Bryham with Puck.

124. Furthermore, if a POSITA were concerned about “exposing a towing vehicle and trailer to highly corrosive environments” as Dr. Winkel argues (*see* EX1004, Winkel Decl., ¶335), they certainly would not have looked to substitute Puck’s trailer, which did not need to be submersed in a manure lagoon, for a ground engaging propulsion structure that would be submersed in a manure lagoon the entire time the manure agitation vehicle was operating in the lagoon. In other words, if a POSITA were concerned that the “corrosive” environment of a manure lagoon might damage Puck’s trailer and trailer wheels/bearings, that concern would lead them away from adding Bryham’s wheels to Puck’s manure lagoon agitation boat because the wheels, bearings, etc. of Bryham’s ground engaging propulsion structure would be immersed and remain in the corrosive manure lagoon for the entire period of time during regular agitation sessions, which often take multiple hours. It is entirely illogical to believe that a POSITA that would be concerned about corrosion to trailers and components of trailers such as wheels, would then put those components on the vehicle that would be in the corrosive environment.

125. As a result, it is my opinion that Petitioner's combination of Puck and Bryham would not actually solve the alleged problem of equipment exposure to the corrosive manure lagoon environment. In fact, the opposite is true. A POSITA would expect corrosion problems to be worse if Bryham's wheels and associated steering, support, and propulsion structure were added to Puck's manure agitation boat.

126. The manure agitation boat disclosed in Puck is designed to be launched and retrieved using a trailer:



EX1014, Puck, Figs. 8 and 9. As a result, Puck fails to teach the limitation of Claims 41, 57, 79, and 80 reciting “ground engaging propulsion structure comprising a plurality of ground engaging elements/wheels.”

127. Dr. Winkel asserts that a POSITA would **add** Bryham's wheels to the manure agitation boat disclosed in Puck; however, in my opinion a POSITA would not have had a reasonable expectation of success in making this combination and achieving the claimed invention.

128. Bryham discloses a vee-hull boat with three wheels (one at the bow and two at the stern) that can retract and extend into and out of the boat hull:

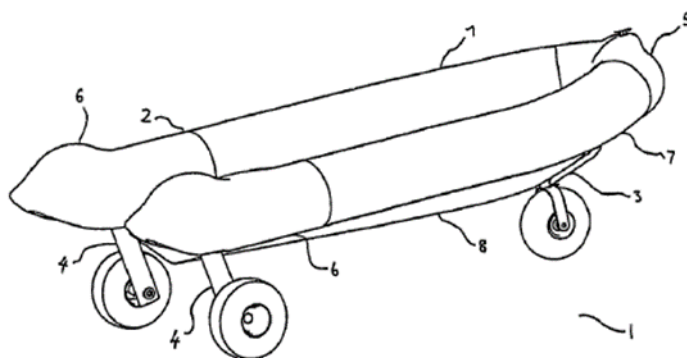


Figure 1

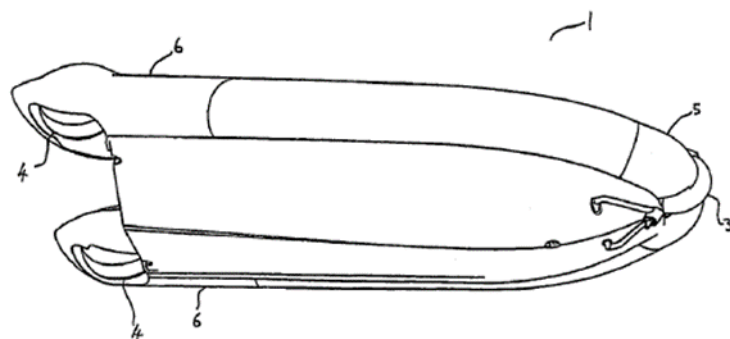


Figure 2

EX1015, Bryham, p. 2.

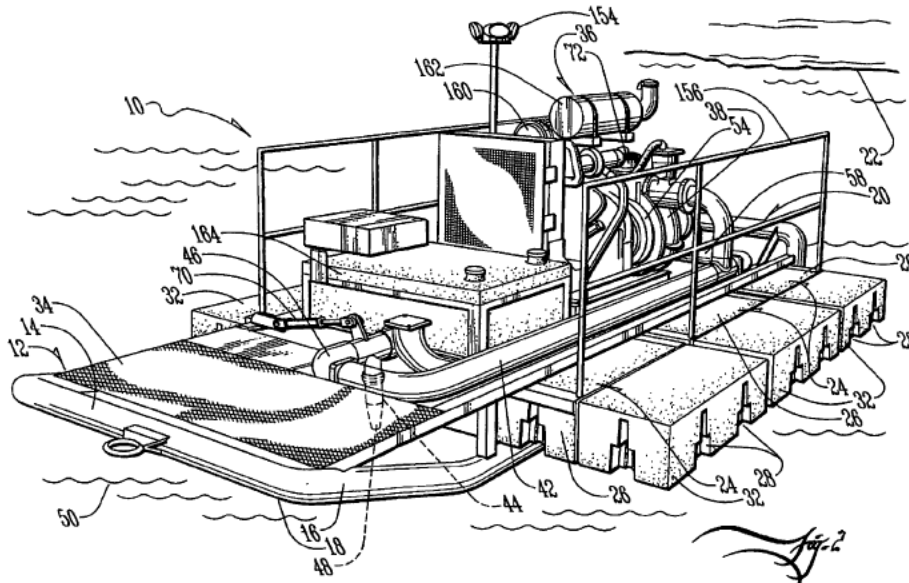
129. Unlike Bryham, Puck is more of a barge compared to a traditional boat and is constructed from modular floating dock sections 26 that are placed in a plurality of receiver slots 24 in a ladder-like frame 14:

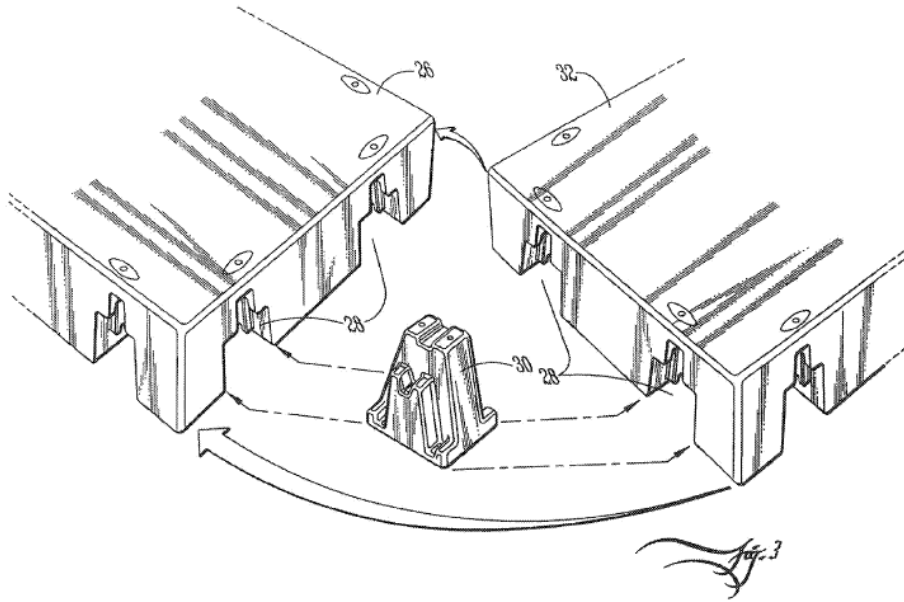
(10) from a manure lagoon (22). (FIGS. 1-2). The frame (14) defines a plurality of receiver slots (24) into which are provided modular dock sections (26), such as those known in the art. In the preferred embodiment, the dock sections (26) are 1000 series dock components manufactured by Connect-A-Dock, Inc. of Atlantic, Iowa.

[0023] The modular dock sections (26) are provided with connector slots (28) to fit into interlocking mating engagement with connector pins (30). The connector pins (30) allow the modular dock sections (26) to connect to additional dock sections (32) in a manner such as that known in the art. (FIGS. 1 and 3). The use of interlocking additional dock sections (32) allows for the buoyancy of the vessel (12) to be increased and allows the additional dock sections (32) to be removed to reduce the overall width of the agitator (10) for transport and storage. If desired, pontoons, inflatable components or any

EX1014, Puck, ¶¶22-23.

130. The modular dock sections 26 in Puck are held together with connector pins 30:





EX1014, Puck, pp. 3-4.

131. In view of this disclosure, a POSITA would not reasonably expect that Bryham's wheels could be successfully added to Puck's vessel. A POSITA would understand that adding Bryham's wheels would interfere with the modular dock sections required in Puck for floatation as the two could not occupy the same space.

132. In my opinion, a POSITA would also understand that Puck's vessel is not designed so that its entire weight can be carried at 3 discrete points (one in the front and two in the rear) as it would be if Bryham's wheels were added.

133. Puck's vessel is designed so that its weight is evenly distributed when it is on shore and on the trailer. The connector pins that hold the modular dock sections together slide into slots in the modular dock sections from the bottom and the connector pins are wider at the bottom than they are at the top. A POSITA would understand that this design gives the connection between the modular dock sections good weight carrying ability when they are floating, but it is not designed to hold the modular dock sections together when they are suspended above the ground, as they would be if Bryham's wheels were added.

134. Finally, Dr. Winkel readily acknowledges that manure lagoons – the environment

in which Puck's vessel operates – often have steep and slippery embankments:

A POSA would have understood that manure lagoons often do not have a designated paved ramp for launching and retrieving vehicles and that the embankments surrounding lagoons are often steep and may be muddy or covered in vegetation. EX1040, 55. The Northeast Regional Agricultural Engineering Service notes that outside bank slopes may be as steep as 3:1.

EX1004, Winkel Decl., ¶¶334, 336. But Dr. Winkel does not explain why a POSITA would have expected the 3-wheel design disclosed in Bryham to provide Puck's vessel with the capability of traversing these steep and slippery embankments.

135. In my opinion, a POSITA would not reasonably expect that Puck's vessel could successfully drive into and out of manure lagoons even if Bryham's wheels could be added. A POSITA would expect Bryham's 3-wheel design to be inherently unstable, i.e., prone to tipping if used on steep and uneven terrain. A POSITA would also expect the one small steerable front wheel in Bryham to be prone to sliding in this operating environment and would be ineffective in turning the vehicle. Finally, a POSITA would not expect Bryham's 3-wheel design, with only two powered wheels at the stern, to provide sufficient traction through mud and manure. As a result, Dr. Winkel has failed to demonstrate that a POSITA would reasonably expect that Puck's vessel could successfully traverse the steep and slippery embankments when entering and exiting manure lagoons if Bryham's wheels were added to Puck's vessel.

136. In my opinion, a POSITA would recognize that the instability, steering, and traction issues with Bryham's ground engaging wheels would be exacerbated if remote control were added because remote control is less precise, has greater delay (latency), and it is much more difficult for the operator to perceive and counter tipping (i.e., remote control operators lack tactile feedback through the controls and or an on-board perception of sliding and tipping). While the operator might not get hurt if a remote-control vehicle tips, tipping creates a considerable set back as the remote control vehicle can become damaged by tipping and manned heavy equipment would likely

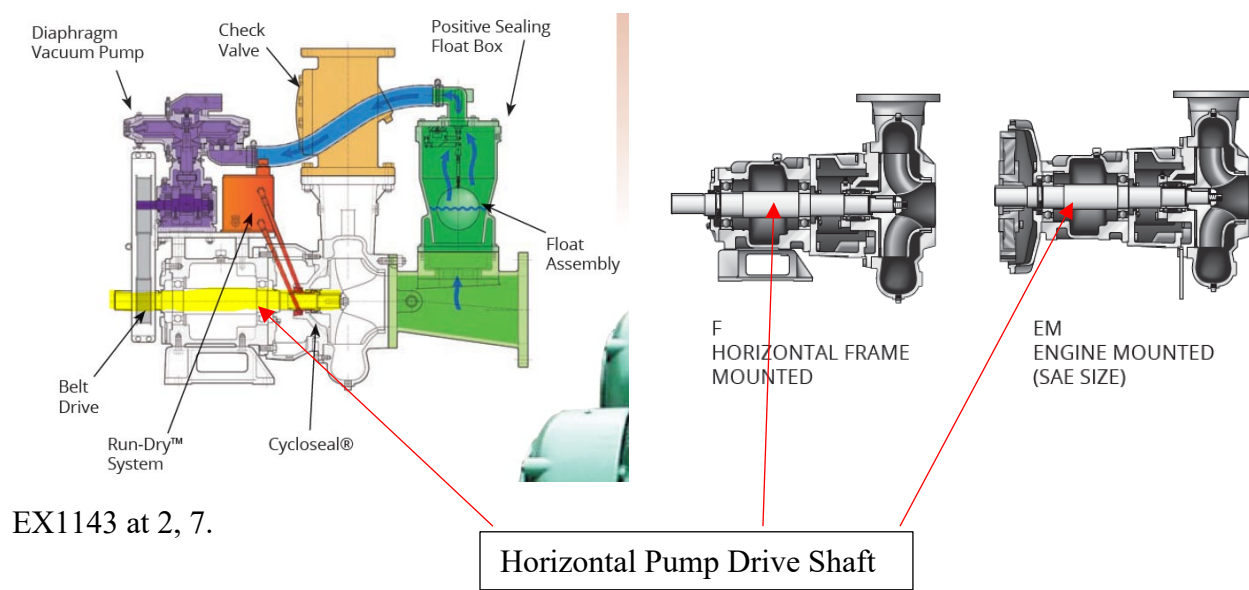
be necessary to extract the vehicle from the manure lagoon and/or right the vehicle. This tilting risk would dissuade a POSITA from adding Bryham's wheels to the remote-controlled manure agitation boat disclosed in Puck.

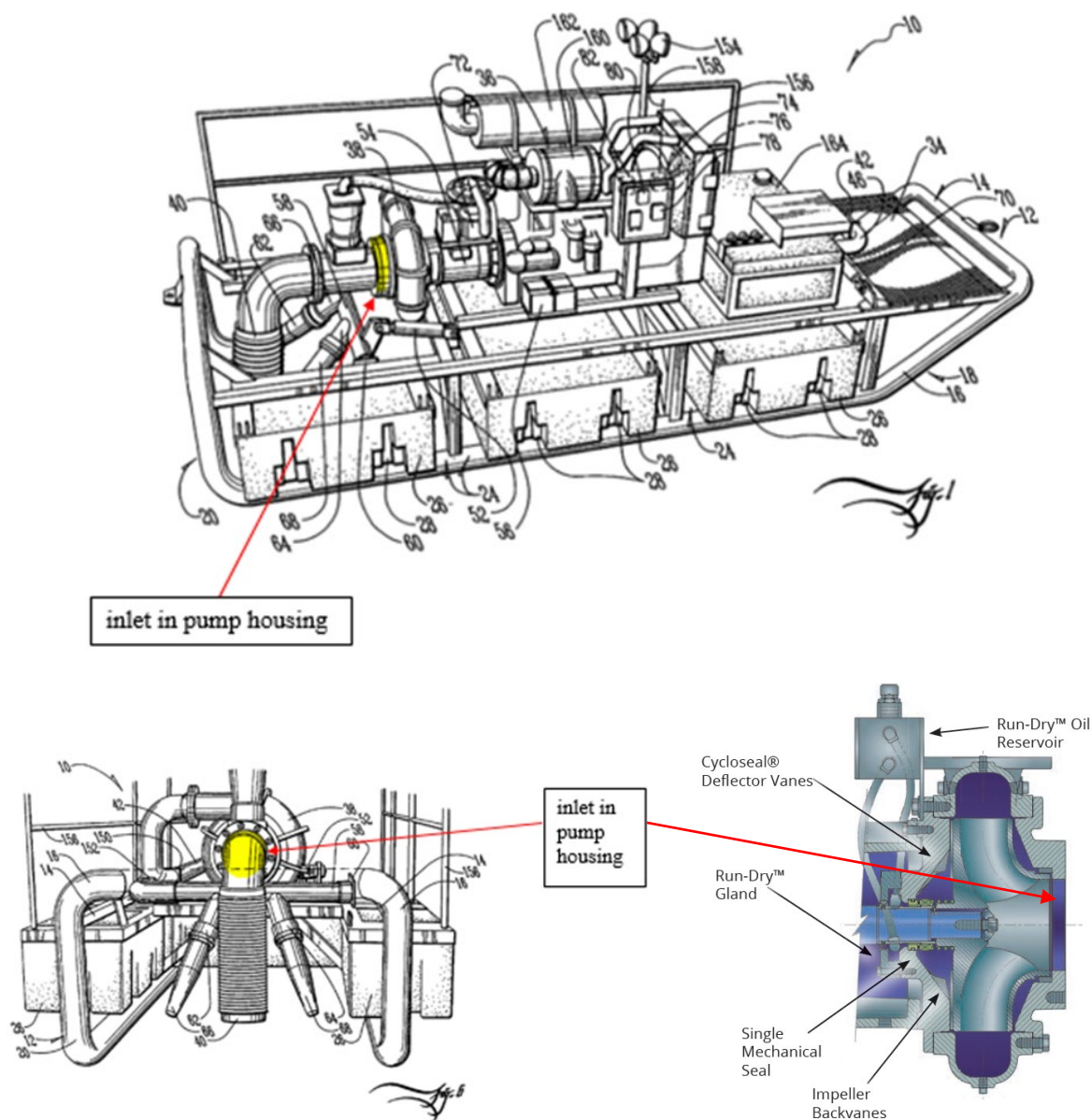
137. In summary, it is my opinion that no POSITA would have ever looked to Bryham when attempting to design an amphibious vehicle for use in agitating and recirculating liquid manure in a liquid manure lagoon, nor would a POSITA have looked to modify Puck to be amphibious. As such, it is my opinion that Petitioner's combinations of references fail to show that the Substitute Claims are obvious.

XI. SUBSTITUTE CLAIMS 41-80 ARE PATENTABLE OVER PUCK IN VIEW OF THE PUCK BOAT, BRYHAM, AND MANURE-MANAGER

138. In the following section, I examine various elements of the '835 Patent and explain why at least Substitute Claims 41, 57, 79, and 80 are not rendered obvious by Puck in view of the Puck Boat, Bryham, and Manure-Manager ("the Puck Combination"), which is the only prior art combination that was asserted by Petitioner in its Opposition (Paper 47) to Patent Owner's Revised Motion to Amend (Paper 42). Substitute Claims 42-56 depend from Substitute Claim 41 and Substitute Claims 58-78 depend from Substitute Claim 57 and are not rendered obvious by the Puck Combination for at least the same reasons.

139. It is my opinion that Substitute Claims 41, 57, 79, and 80 are patentable over Puck in view of the Puck Boat, Bryham, and Manure-Manager. As discussed above, Puck discloses an agitation boat including a slurry pump (38) that is illustrated on top of the boat hull at a location that is high above the surface of a manure lagoon. The liquid manure intake pipe (40) is positioned at the rear of the boat, with a ninety-degree bend so that the intake pipe extends down into the manure lagoon. (EX1014, FIGS. 1 and 8). The slurry pump (38) in Puck is mechanically powered by a horizontal drive shaft and has a rear-facing fluid opening in the back of the pump housing.



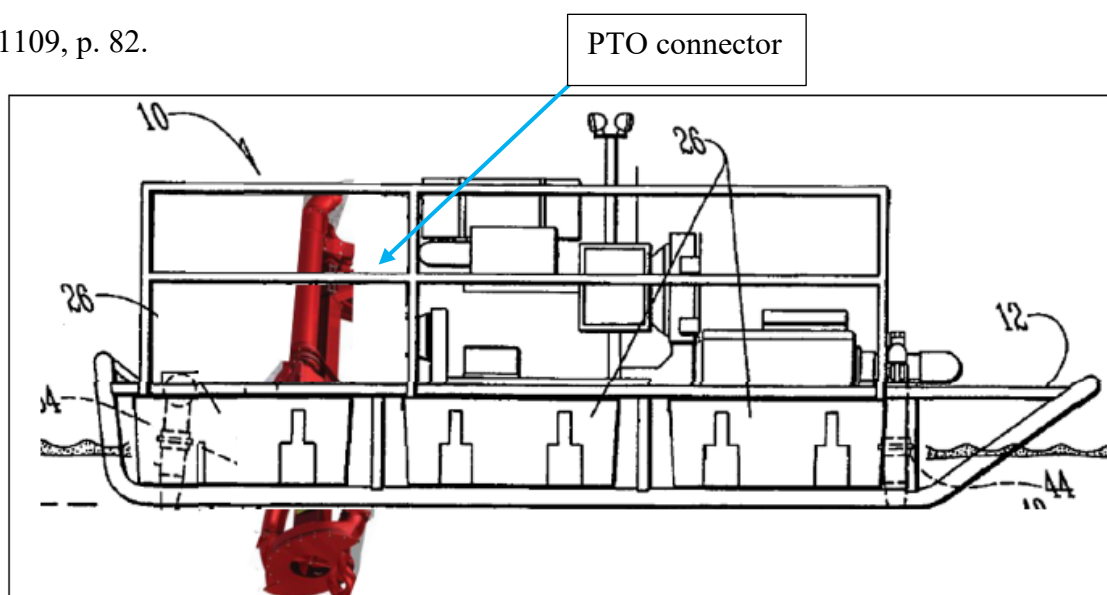


[EX1014], Puck, pp. 2, 7, FIGS. 1 and 6 (pump housing annotations added); EX1143 at 7. The impeller and the pump housing of the slurry pump (38) in Puck are not located on the underside of the boat (Distinguishable Element [V]) and Puck's pump (38) is not immersed in the manure lagoon when the boat is floating (Distinguishable Element [III]). (EX1014, FIGS. 1 and 8). Bryham discloses a boat with amphibious wheels. (EX1015, Bryham, 2). A combination of Puck with Bryham would therefore not result in vehicle with a hydraulically powered, immersible liquid manure pump (Distinguishable Element [I]), much less an arrangement where the pump housing

is positioned along the underside of the floatable vehicle body rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body (Distinguishable Element [V]), is immersed in the liquid manure when the vehicle is floating (Distinguishable Element [III]), has a substantially vertical drive shaft (Distinguishable Element [II]), and/or is located in the space between the four ground engaging wheels (Distinguishable Element [VI]), or where components / portions of the vehicle that are submerged when the vehicle is floating are: (1) spaced from and positioned to each side of the pump housing, and (2) spaced from and positioned directly forward of and directly rearward of the pump housing, to keep floating solid material away from the bottom fluid opening in the pump housing (Distinguishable Element [V]), as required by the Substitute Claims.

140. I disagree with Dr. Winkel's combination of Manure-Manager with Puck, the Puck Boat, and Bryham because, as shown below, where Nuhn's Pit Pump is mounted in a location that would be illogical to a POSITA based on the teachings of Manure-Manager and Puck.

EX1109, p. 82.



The boom arm of Nuhn's Pit Pump is approximately 10 feet long. Petitioner's arrangement is illogical because it would not permit Nuhn's Pit Pump to pivot/swing up and down so it would get in the way upon entry and exit of a manure lagoon. Petitioner's arrangement also places the PTO

connector at the upper end of the boom arm high up far away from the crankshaft of Puck's power source. A POSITA would not think to make such an arrangement. Nor does Manure-Manager or Puck teach or suggest an arrangement where the pump housing and/or impeller of a liquid manure pump is positioned along the underside of the floatable vehicle body.

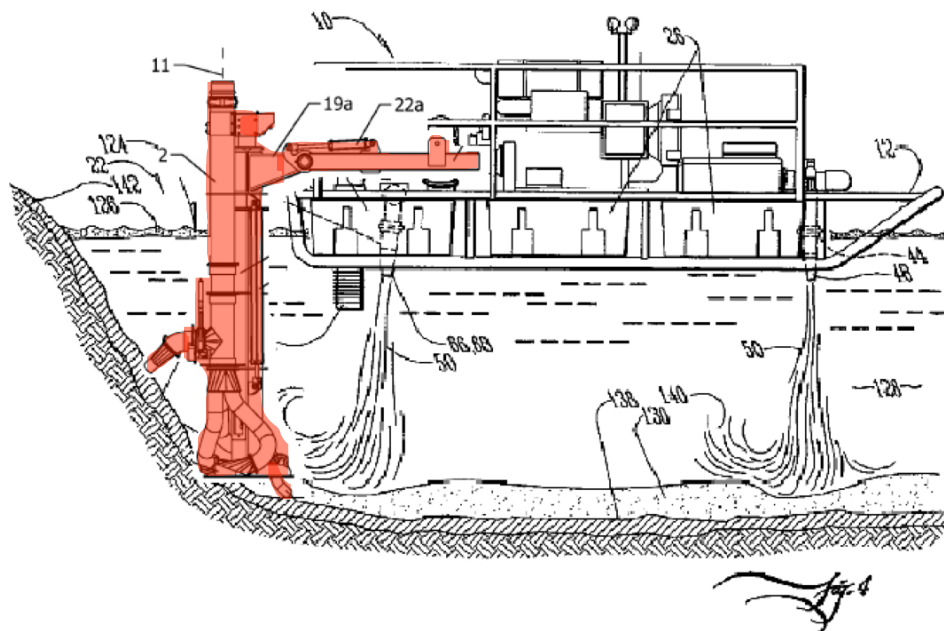
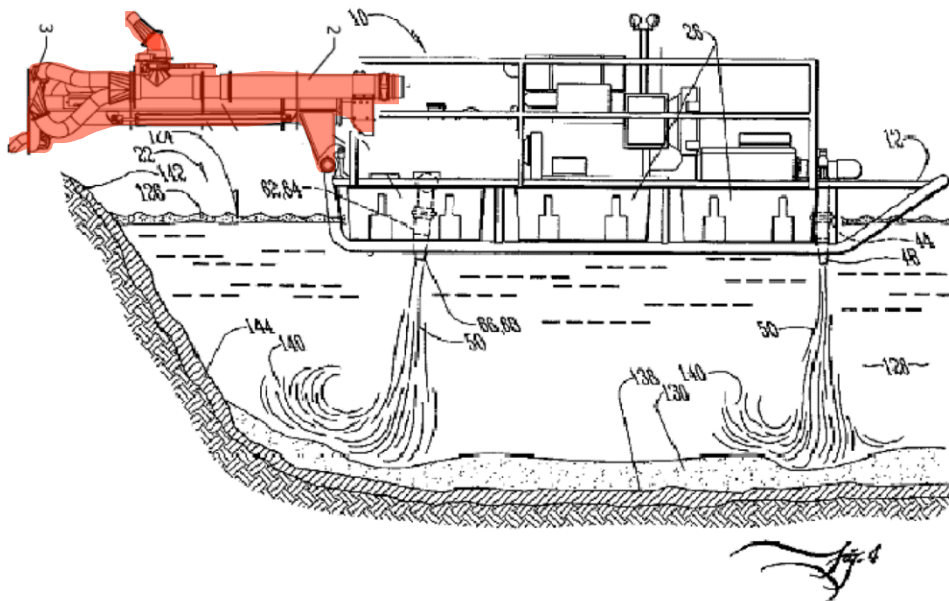
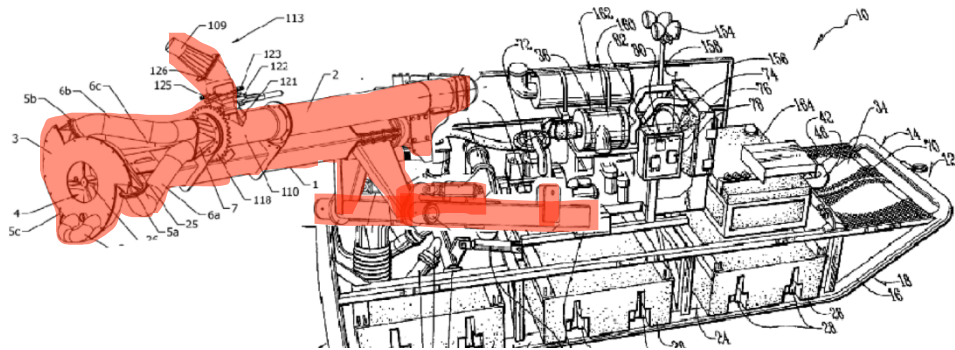
141. Manure-Manager teaches a POSITA to locate a submersible manure pump at the lower end of a boom arm. The upper end of the boom arm opposite the manure pump is configured to be attached to the three-point mount on a tractor and the manure pump is powered/driven by the power-take-off (PTO) of the tractor, which couples to a driveshaft located at the upper end of the boom arm:



EX1088, p. 27.

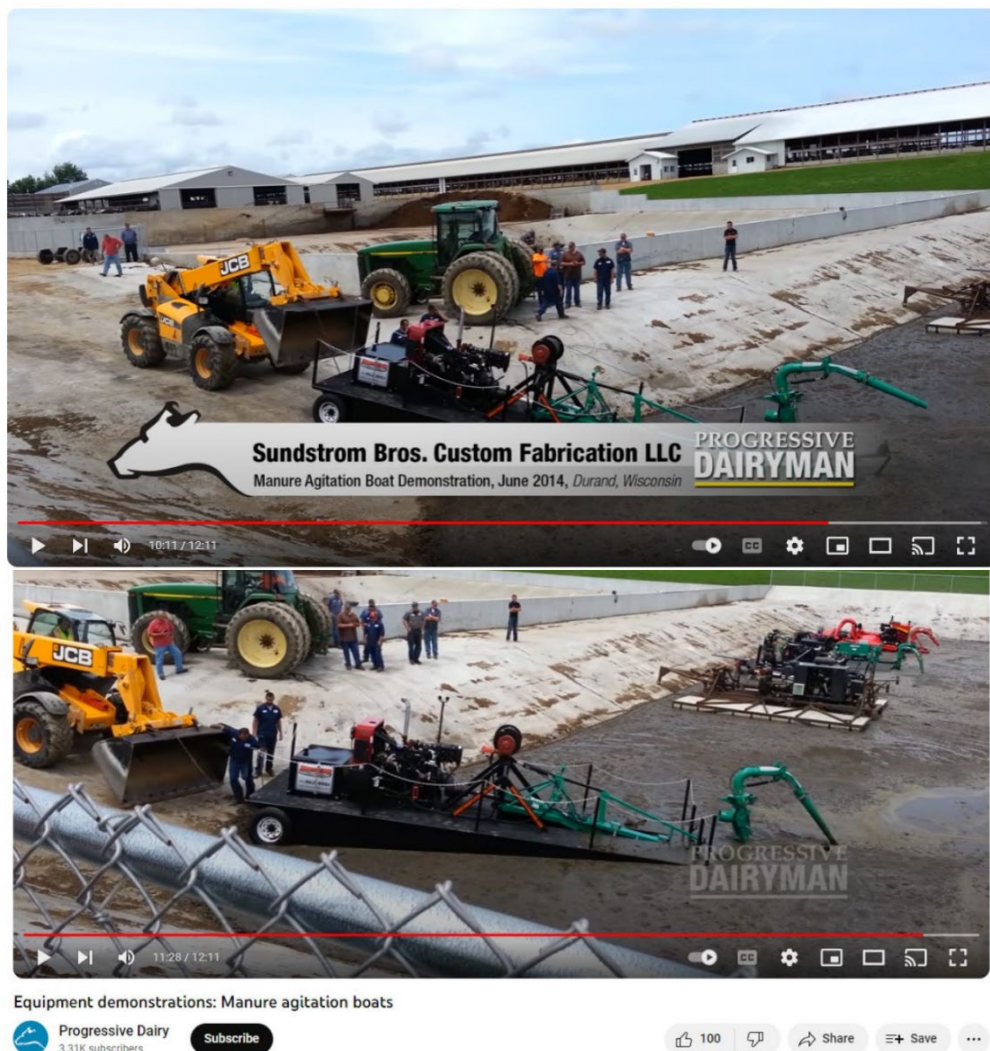
142. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the boom arm to the rear of a vehicle body in such a way that the boom arm could pivot so the lower end is immersed in the manure and the upper end can mate with a drive shaft to receive power. As will be shown below, what would have been logical to a POSITA is to attach the pivot of arm 19a to the rear crossbar 16, 20 in Puck so that Nuhn's Pit Pump could pivot up and down in a similar manner to the way it operates when attached to the rear hitch of a tractor and so that the PTO connector 29 on the upper end of the boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Nuhn's power source.

143. I disagree that a POSITA would add Bryham's wheels to Puck or a combination of Puck and Manure-Manager for the reasons discussed in my previous Declarations (EX2004, EX2094), but if a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump (which is advertised in Manaure-Manager), then the resulting combination would look like this:



144. My opinion regarding how a POSITA would go about adding Nuhn's Pit Pump to Puck, if they were so motivated, is not based on speculation (like Dr. Winkel's opinion), but rather is based on record evidence. In particular, I note that both Sundstrom (EX1153, EX1154, EX1156) and the Puck Prototype (EX1159) show other POSITAs' attempts at adding boom-mounted pumps to manure agitation boats/barges. In both cases, Sundstrom and Puck retained the boom arm, pivot structure, and pivot functionality of the pumps so that the boom-mounted pump could be tilted down and up into and out of the lagoon.

145. As shown below, Sundstrom's floating manure agitator included a GEA Houle liquid manure pump mounted on the front end of a long boom arm. The boom arm extends forward at an angle that can be tilted up and down to a limited degree.



EX2008, 8-9.



EX1156, at 1.

146. The Puck Prototype included two submersible, boom-mounted pumps positioned on the right and left sides of the floating barge:



EX1159, p. 3.



EX1159, p. 5.

As shown in the photographs above, the submersible pumps are mounted on the far end of a boom arm that can tilt/swing up and down and be lowered into and out of the manure lagoon. In the lowered operating position, the submersible pumps on the end of the boom arms are spaced far below the bottom of the barge by a distance that appears to be on the order of several feet.

147. Both Sundstrom and the Puck Prototype reflect what other POSITAs in the art actually did during the same approximate time period (i.e., same decade) as Nuhn's invention. This evidence leads me to the conclusion that a POSITA would have mounted Nuhn's Pit Pump to Puck's boat with little modification, if they were motivated to make such a combination in the first place, and that they would have retained the long 10ft boom arm, pivot structure, and pivot functionality of Nuhn's Pit Pump because that is entirely consistent with what Sundstrom and Puck actually did.

148. On the other hand, this record evidence does not support Petitioner's combination, which does away with the pivot structure and pivot functionality of Nuhn's Pit Pump, and either

significantly shortens the boom arm or does away with it completely. None of those modifications were made by Sundstrom or Puck, let alone vertically orienting a submersible manure pump in a central (i.e., interior) region of the vehicle with a constant angular orientation.

149. In view of the above analysis, if a POSITA were to add Nuhn's Pit Pump to Puck's boat, that combination would result in a pump at the far end of an articulating boom arm hanging off the rear of Puck's boat so that it could swing up and down in the same manner as when Nuhn's Pit Pump is attached to a tractor. Thus, the combination of Manure-Manager and Puck would not result in a vehicle where the liquid manure pump "has a constant angular orientation relative to the floatable vehicle body" (Distinguishable Element [IV]) or a pump housing and impeller "positioned along the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body" (Distinguishable Element [V]), as required by the Substitute Claims.

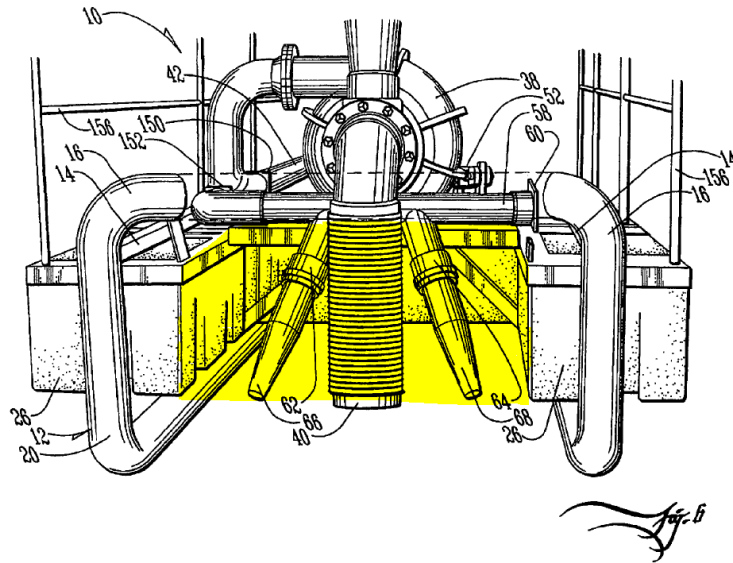
150. Petitioner's proposed combination is flawed because it assumes that a POSITA would skip past the most logical combination, as described above, which would be easier to implement and which is actually suggested by Sundstrom and the Puck Prototype, where the pump is mounted on the end of a pivoting boom arm, in favor of a more complicated and undisclosed arrangement that would require a substantial amount of re-design work to mount and power a vertically oriented submersible manure pump positioned along the bottom of Puck's boat. Such an arrangement is not suggested by the prior art and is purely hindsight based.

151. To implement Petitioner's proposed arrangement of Nuhn's Pit Pump on Puck's boat, a POSITA would be required to: (1) design a new mounting structure for the liquid manure pump and discard the mounting structure disclosed in Manure-Manager, (2) design a new drivetrain to power the liquid manure pump, since the drive shaft of Nuhn's Pit Pump would not be aligned with or at the same orientation as the output shaft of Puck's engine, and (3) design a new conduit system for carrying liquid manure from Nuhn's Pit Pump to Puck's nozzles. In my opinion, a POSITA would not have selected Petitioner's proposed arrangement in view of these

obstacles (i.e., the extra design work involved to implement Petitioner’s proposed arrangement) when a much simpler and easier to implement arrangement was available and was actually suggested by the art (e.g., Sundstrom). That simpler and easier to implement arrangement is the one I have described and illustrated above, where the mounting structure, drivetrain, and pivoting boom arm of Nuhn’s Pit Pump are retained.

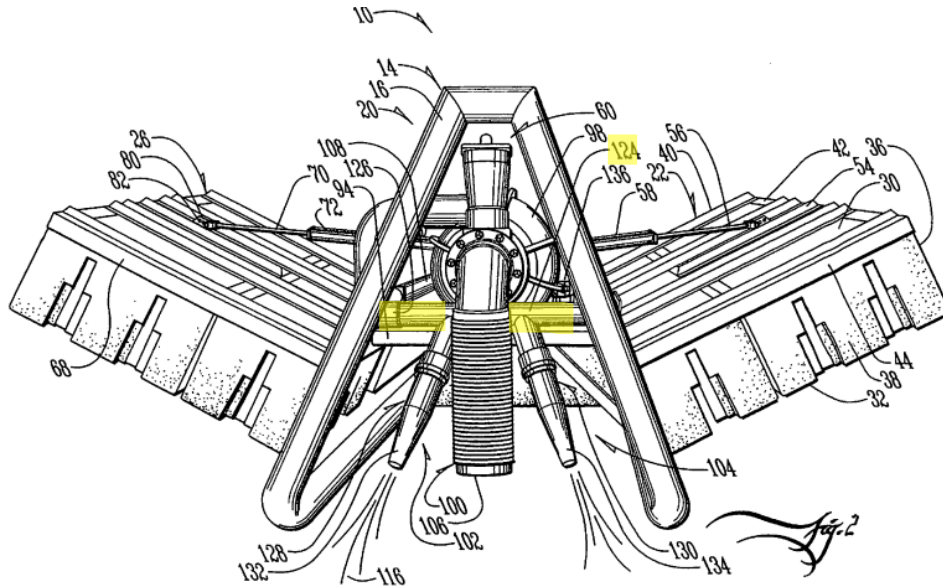
152. I also disagree with Dr. Winkel that a POSITA would have been motivated to select Petitioner’s proposed arrangement. According to Dr. Winkel, a POSITA would have been motivated to position Nuhn’s Pit Pump near the center of Puck’s boat to allow for a more centrally located center of gravity. EX1111, ¶112. But a POSITA would have understood that a vehicle’s center of gravity depends on the combined weight and location of each component of the vehicle, so mounting Nuhn’s Pit Pump to the rear of Puck’s boat, as illustrated above, does not necessarily result in a center of gravity that is not near the center of the vehicle. Indeed, a POSITA would have understood that the weight of Nuhn’s Pit Pump at the rear of Puck’s boat would be offset by the weight of the power source (i.e., its John Deere Tier 3 diesel engine that is “preferably between one hundred fifty and two hundred fifty horsepower”) (EX1014, ¶0024) at the front of Puck’s boat.

153. Finally, even if Petitioner’s combination were made, the resulting vehicle still fails to satisfy the limitations of the Substitute Claims. The rear of Puck’s boat has a U-shaped cut-out between the floating dock sections (26) where the liquid manure intake pipe (40) is positioned, with a ninety-degree bend so that the intake pipe extends down into the manure lagoon.



EX1014, Fig. 6. Even if a POSITA positioned Nuhn's Pit Pump in this space, as Petitioner suggests, there would be no submerged components that "are spaced from and positioned ... directly rearward of the pump housing ... to keep floating solid material away from the bottom fluid opening in the pump housing" (Distinguishable Element [VII]), as required by the language of the Substitute Claims.

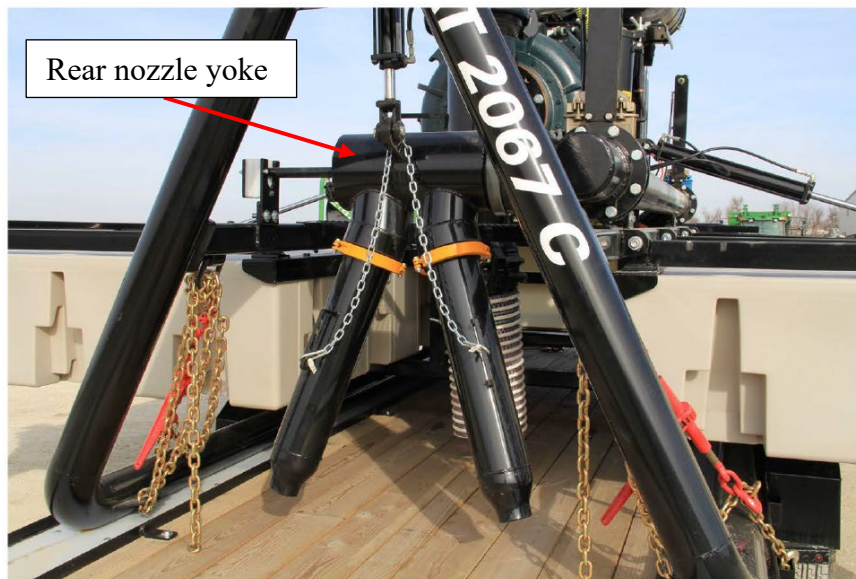
154. As explained above, the Puck Boat is the commercial embodiment of the vehicle described in U.S. Publication No. 2013/0145980 (EX2107, Puck II).



EX2107, Puck II, pp. 2-3, FIGS. 1-2.

As shown above, in Puck II, the rear nozzle yolk 124 is positioned **forward** of the downwardly directed intake pipe 100,

155. Unlike in Puck II, where the rear nozzle yolk 124 is positioned forward of the downwardly directed intake pipe 100, the rear nozzle yolk on the Puck Boat (i.e., the commercial embodiment) is positioned behind the downwardly directed intake pipe near the rear “A” frame structure.



EX1164, p. 41.

156. As discussed above, Nuhn’s Pit Pump is designed to swing up and down, which is a feature that a POSITA would have retained. A POSITA therefore would have positioned the rear nozzle yoke forward of Nuhn’s Pit Pump (like in the configuration disclosed in Puck II) so that the rear nozzle yoke would not interfere with the pivoting boom arm. In my opinion, a POSITA would not have selected the alternative configuration used on the Puck Boat, where the rear nozzle yoke is rearward of the downwardly directed intake pipe, because a POSITA would have recognized that Nuhn’s Pit Pump would contact the rear nozzles and/or rear nozzle yoke when pivoted upward and to the rear of the boat for storage, transport, launching, and retrieval. This interference would have significantly limited the angle one could tilt Nuhn’s Pit Pump upward – a problem that would be avoided by selecting the position of the rear nozzle yoke disclosed in Puck II. As a result, a POSITA would have logically followed the teachings of Puck II’s rear nozzle placement instead of the alternative location for the rear nozzles on Puck’s Boat.

157. Finally, because Puck, the Puck Boat, Bryham, and Manure-Manure all disclose mechanically driven pumps, Petitioner’s combination would still fail to comprise a “hydraulically powered” liquid manure pump (Distinguishable Element [I]), as required by the Substitute Claims.

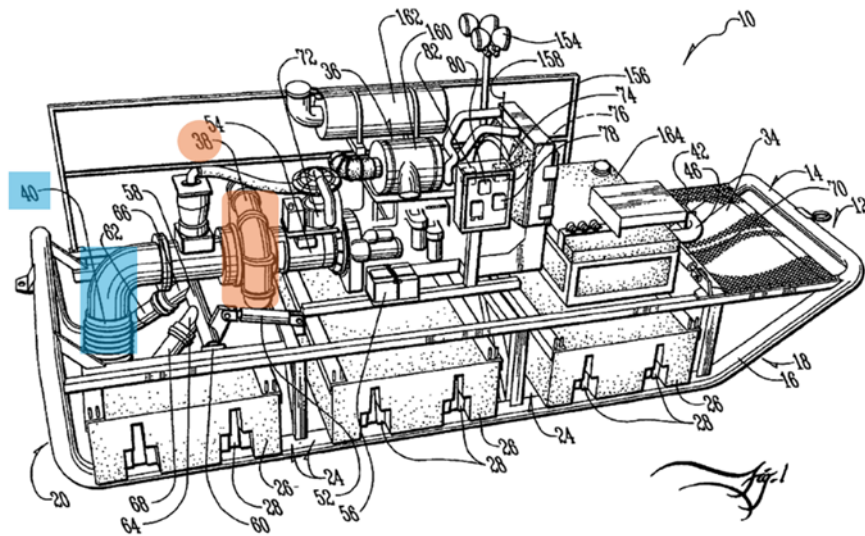
A. Claim 41

1. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST THE CLAIMED POSITION OF THE LIQUID MANURE PUMP, WHERE THE PUMP HOUSING AND IMPELLER ARE POSITIONED ALONG THE UNDERSIDE OF THE FLOATABLE VEHICLE BODY

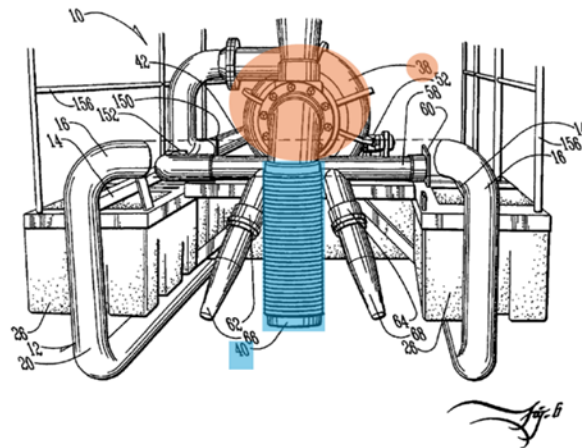
158. The Puck Combination fails to teach or suggest the position of the pump housing and impeller of the liquid manure pump recited in Substitute Claim 41, which requires those components to be positioned along the underside of the floatable vehicle body:

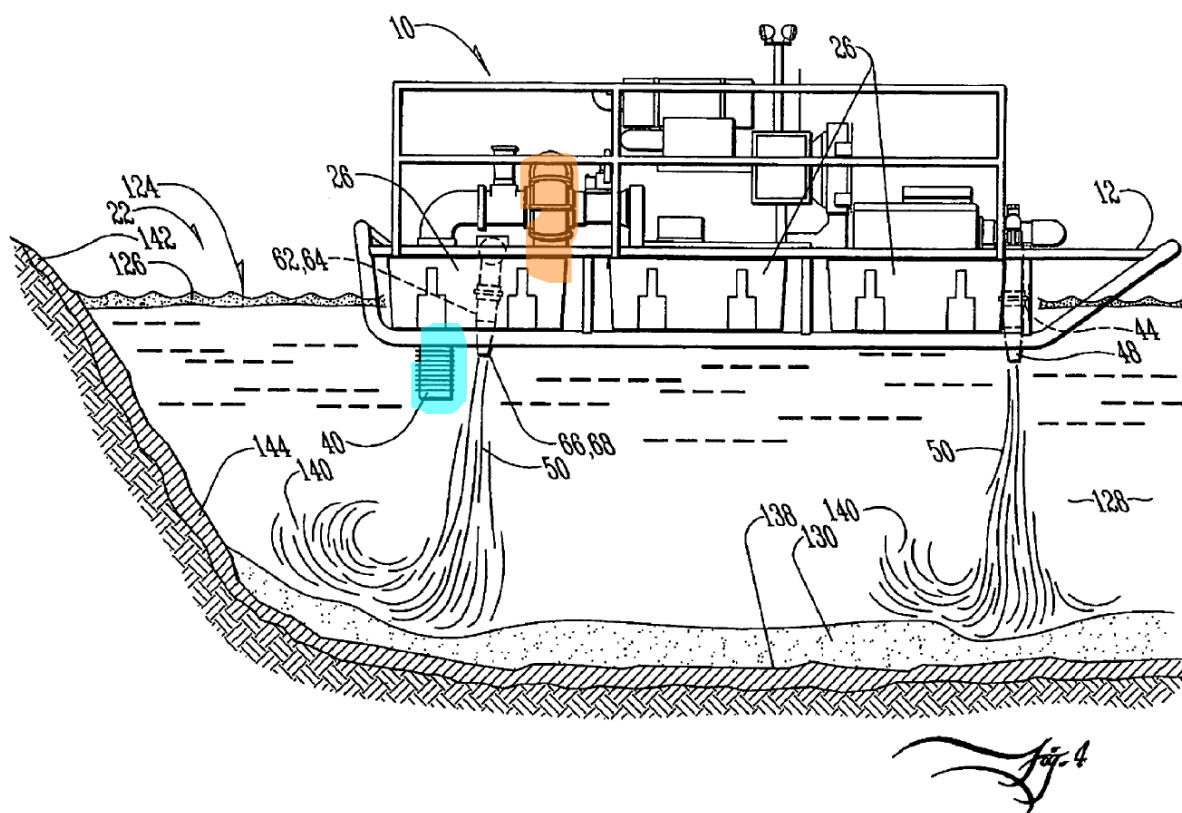
“the pump housing and the impeller of the immersible liquid manure pump are positioned along the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body”

159. Puck discloses a manure agitation boat including a slurry pump (38) that is located well above the floating dock sections (26). As a result, the pump housing in orange in the annotated figures below, and the impeller contained in the pump housing, is spaced above the underside of the floatable vehicle body:



EX1014 at 2 (annotated).





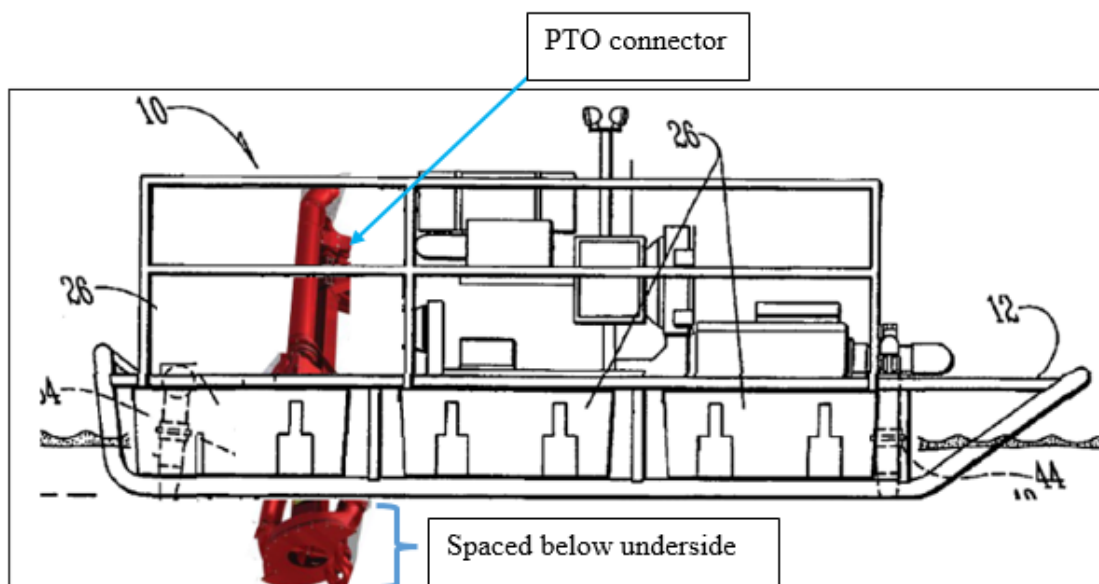
EX1014 at 5, 7 (annotated).

160. A liquid manure intake (40), shown in blue in the annotated figures above, extends towards a reward end of the boat, with a ninety-degree bend downward towards the bottom of the boat. The housing and impeller of the pump (38) are separate and distinct from the intake pipe (40) and are not located on the underside of the boat. Non-immersible liquid manure pumps (like the one disclosed in Puck), require different inlet/housing configurations with pump priming structures compared to submersible pumps. EX1014 at [0031].

161. A POSITA looking to the teachings of Puck when attempting to design a new manure lagoon agitation vehicle would logically follow its disclosure, which teaches placing a non-submersible pump high and dry on top of the floatable vehicle body. Puck does not teach or suggest the claimed arrangements where the liquid manure pump is positioned along the underside of the floatable vehicle body.

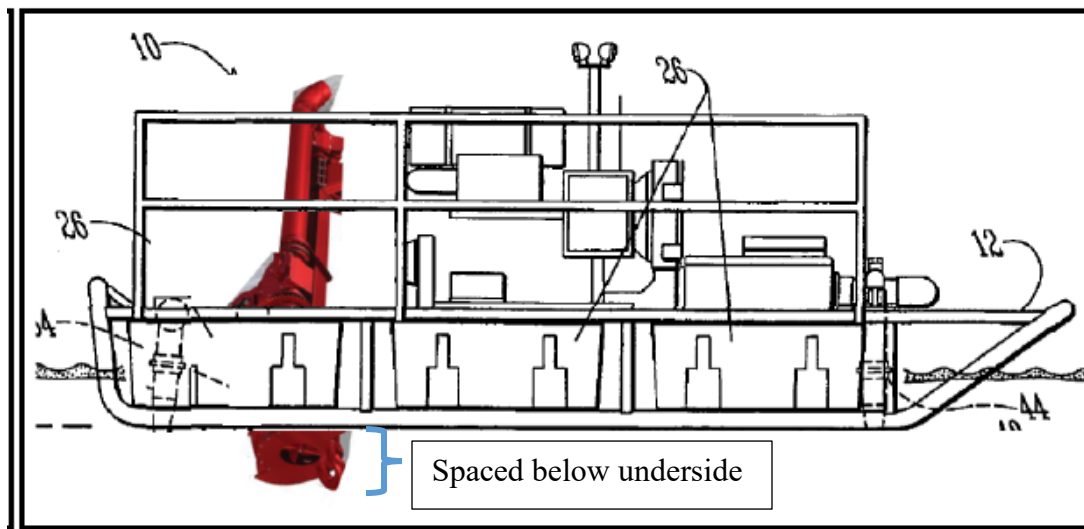
162. I disagree with Dr. Winkel's combination of Manure-Manager with Puck, as shown

below, because Dr. Winkel advocates mounting Nuhn's Pit Pump in a location that would be illogical to a POSITA based on the teachings of Manure-Manager and Puck.



EX1109 in IPR2023-01161, ¶143 (annotated).

Dr. Winkel attempts to correct this in the present IPR, by moving the pump even higher, but these modifications are illogical absent hindsight bias and are contrary to other record evidence (e.g., EX1156 and EX1159) showing how a POSITA would have added Nuhn's Pit Pump to Puck around the time of the invention, if they were motivated to do so.



EX1174, ¶44 (annotated).

163. The boom arm of Nuhn’s Pit Pump is approximately 10 feet long and is therefore much larger than what is shown above. So even if Dr. Winkel’s combination were adopted, the pump housing and impeller would still be spaced well below the underside of the floatable vehicle body by several feet. In other words, a POSITA would not consider the combination shown in the image presented above as a vehicle where the pump housing and impeller are “positioned along the underside of the floatable vehicle body” as required by Substitute Claim 41.

164. Manure-Manager teaches a POSITA to locate a submersible manure pump at the lower end of a boom arm. The upper end of the boom arm opposite the manure pump is configured to be attached to the three-point mount on a tractor and the manure pump is powered/driven by the power-take-off (PTO) of the tractor, which couples to a driveshaft located at the upper end of the boom arm:



EX1088, p. 27 (annotated).

165. Fig. 2 of Nuhn's '758 Patent clearly depicts the PTO connector 29 at the upper end of the boom arm 1 where the driveshaft couples the PTO of the tractor to the gearbox of Nuhn's Pit Pump:

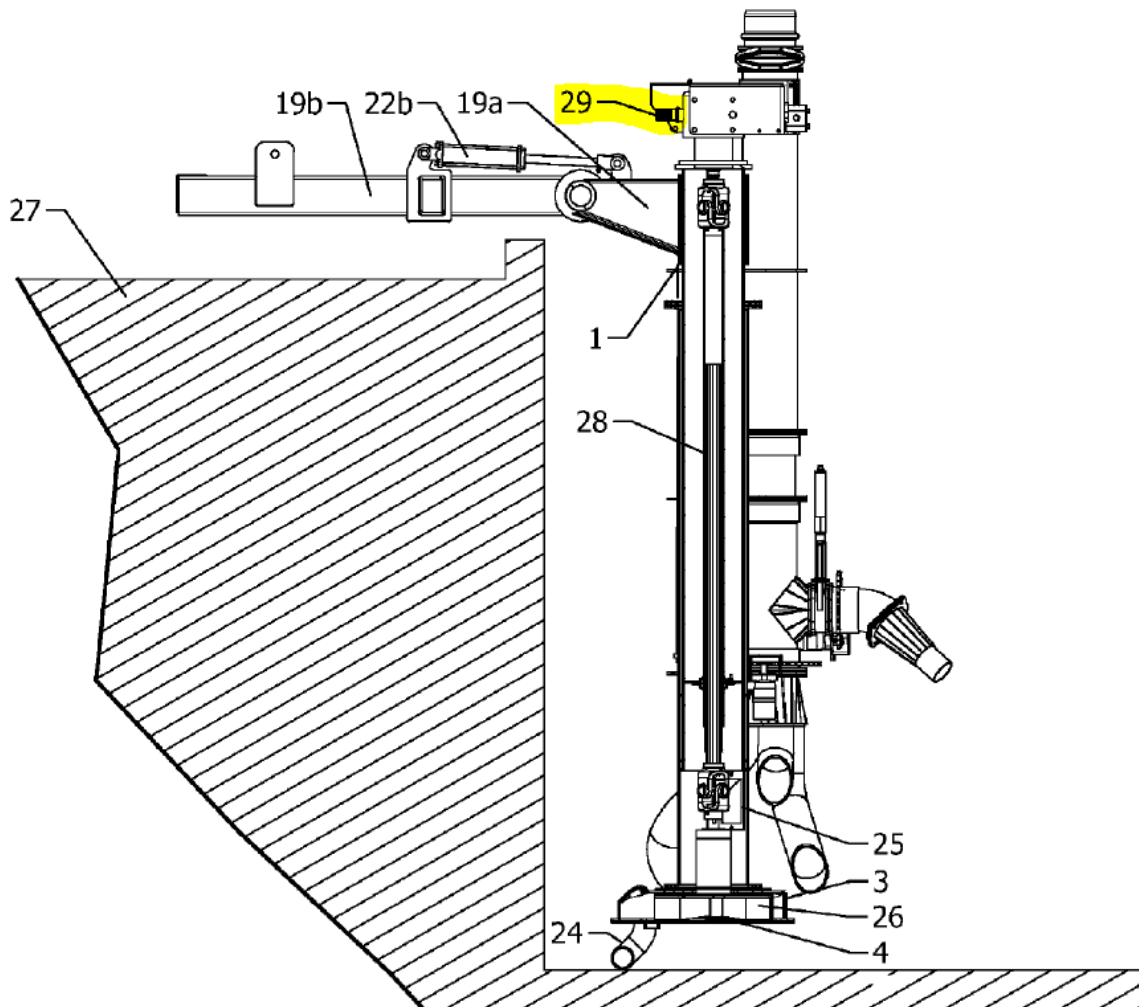
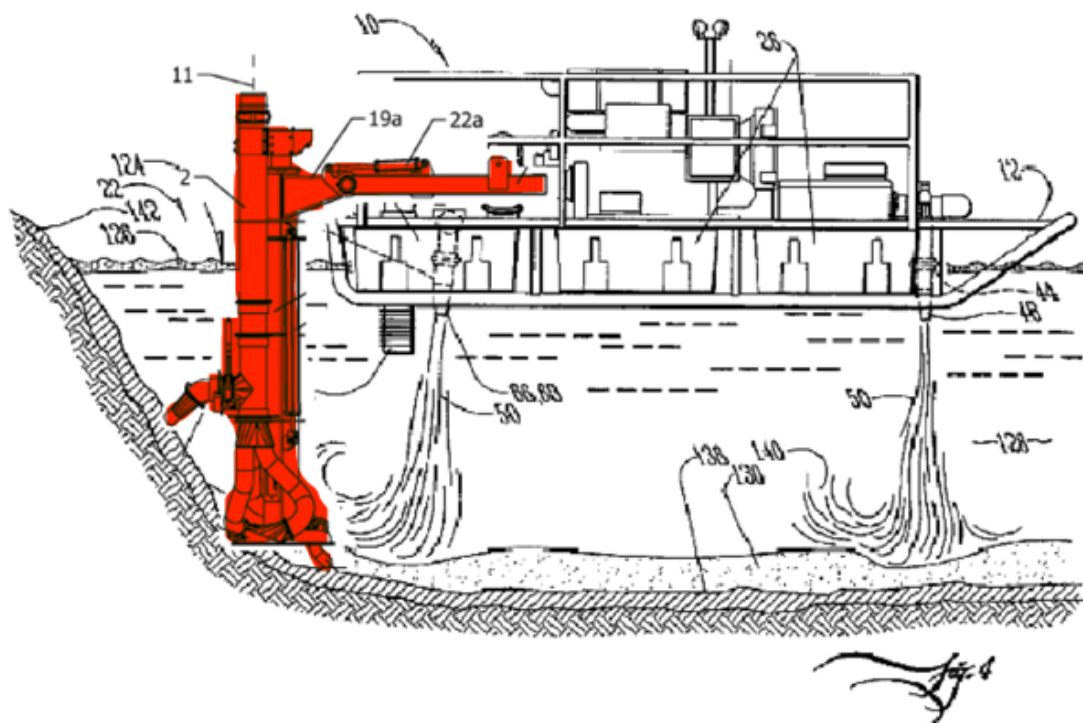


FIG. 2

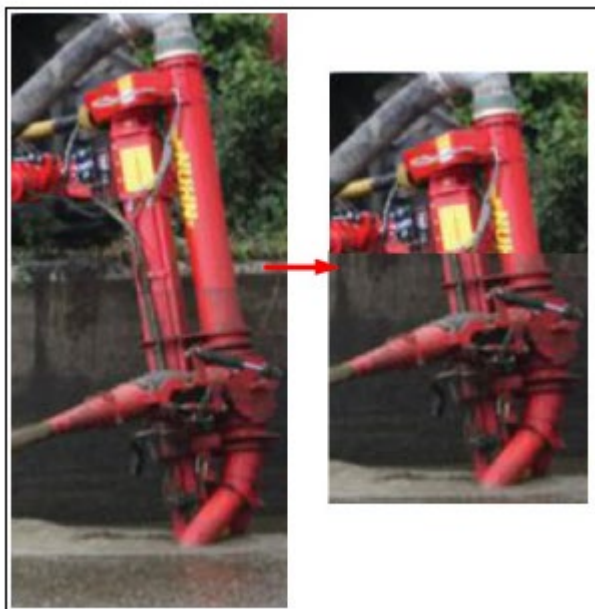
EX2101, Fig. 2.

166. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the pivot of arm 19a to the rear of Puck's deck so that the PTO connector 29 on the upper end of the boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Puck's power source.

167. If a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump, then the resulting combination would look like this:

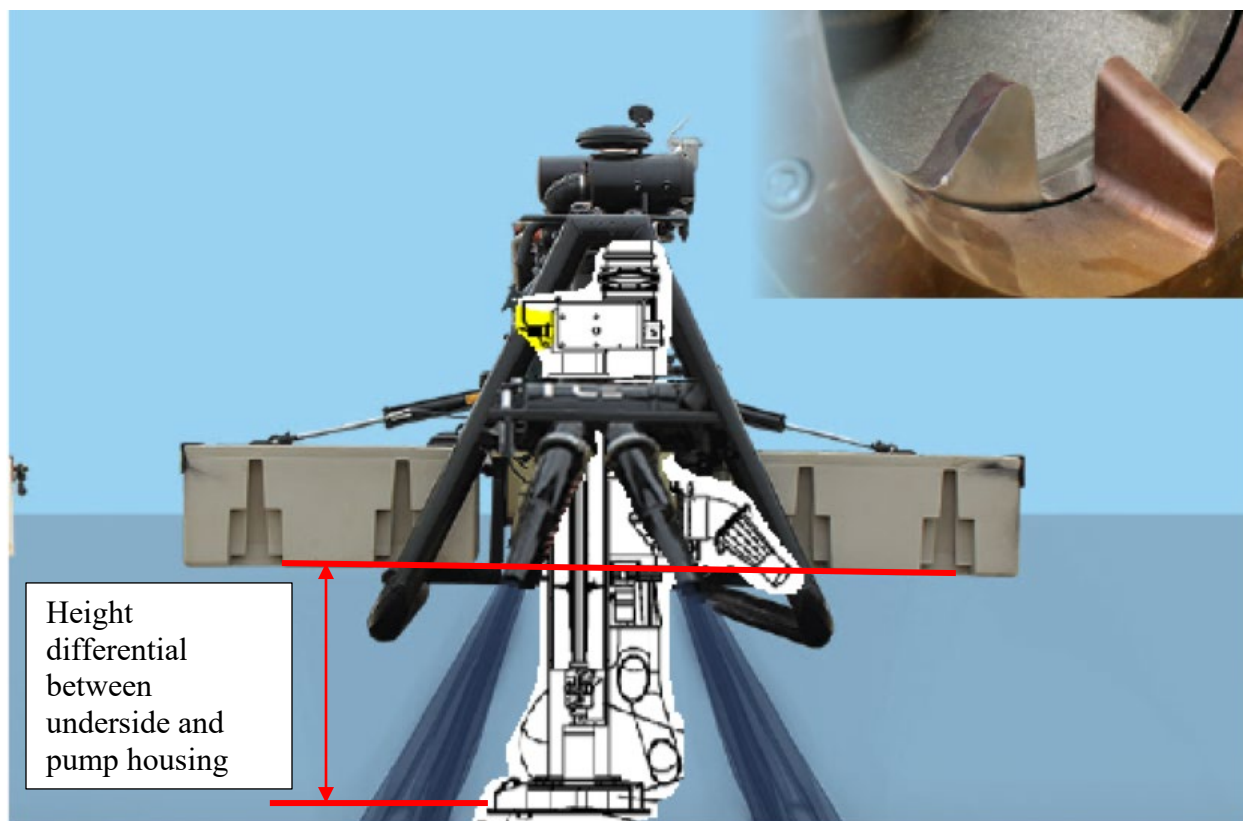


168. In an attempt to address his flawed reasoning, Dr. Winkel argues that a POSITA would shorten the boom arm of Nuhn's Pit Pump, as shown in the photoshopped image below:



EX1174, ¶58.

Dr. Winkel has not cited any evidence that a POSITA would reasonably expect this modification to even be feasible, but even setting that aside, the structure above the pump housing on Nuhn's Pit Pump, including the conduits leading from the pump outlets to the nozzle, the gear box, and the rotation system, all take up significant space (of several feet), and would therefore limit Winkel's theoretical shortening of the boom arm. In the image above, Dr. Winkel has roughly shortened the boom arm by 2-3 feet (from 10 feet to 7-8 feet). Even if this shortening were performed, the result would still be a pump housing and impeller spaced several feet below the underside of Puck's boat.



EX1160, p. 2 (annotated).

169. In view of the above analysis, if a POSITA were to add Nuhn's Pit Pump to Puck's boat, that combination would result in a pump at the far end of a boom arm at a location spaced several feet below the underside of Puck's boat. Thus, the Puck Combination would not result in a vehicle where "the pump housing and impeller are positioned along the underside of the floatable vehicle body" as required by Substitute Claim 41.

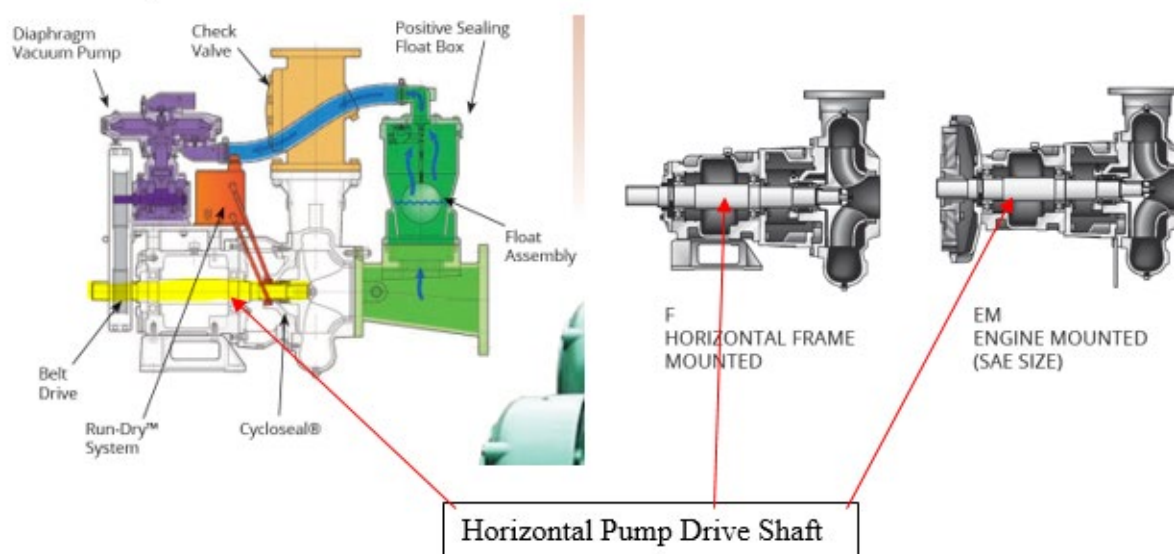
2. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST A LIQUID MANURE PUMP HAVING A VERTICAL DRIVESHAFT AND A CONSTANT ANGULAR ORIENTATION

170. The Puck Combination fails to teach or suggest the fixed orientation of the liquid manure pump recited in Substitute Claim 41, which requires the liquid manure pump to have a substantially vertical driveshaft powering an impeller and a constant angular orientation:

“the immersible liquid manure pump of the liquid manure mover including a substantially vertical drive shaft powering an impeller”

“such that the immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating and has a constant angular orientation relative to the floatable vehicle body”

171. As discussed above, Puck discloses an agitation boat including a slurry pump (38) that is illustrated on top of the boat hull at a location that is high above the surface of a manure lagoon. The slurry pump (38) in Puck is mechanically powered by a horizontal drive shaft and has a rear-facing fluid opening in the back of the pump housing.



EX1143 at 2, 7 (annotated).

172. Puck does not teach or suggest the claimed arrangements where the liquid manure pump has a substantially vertical drive shaft.

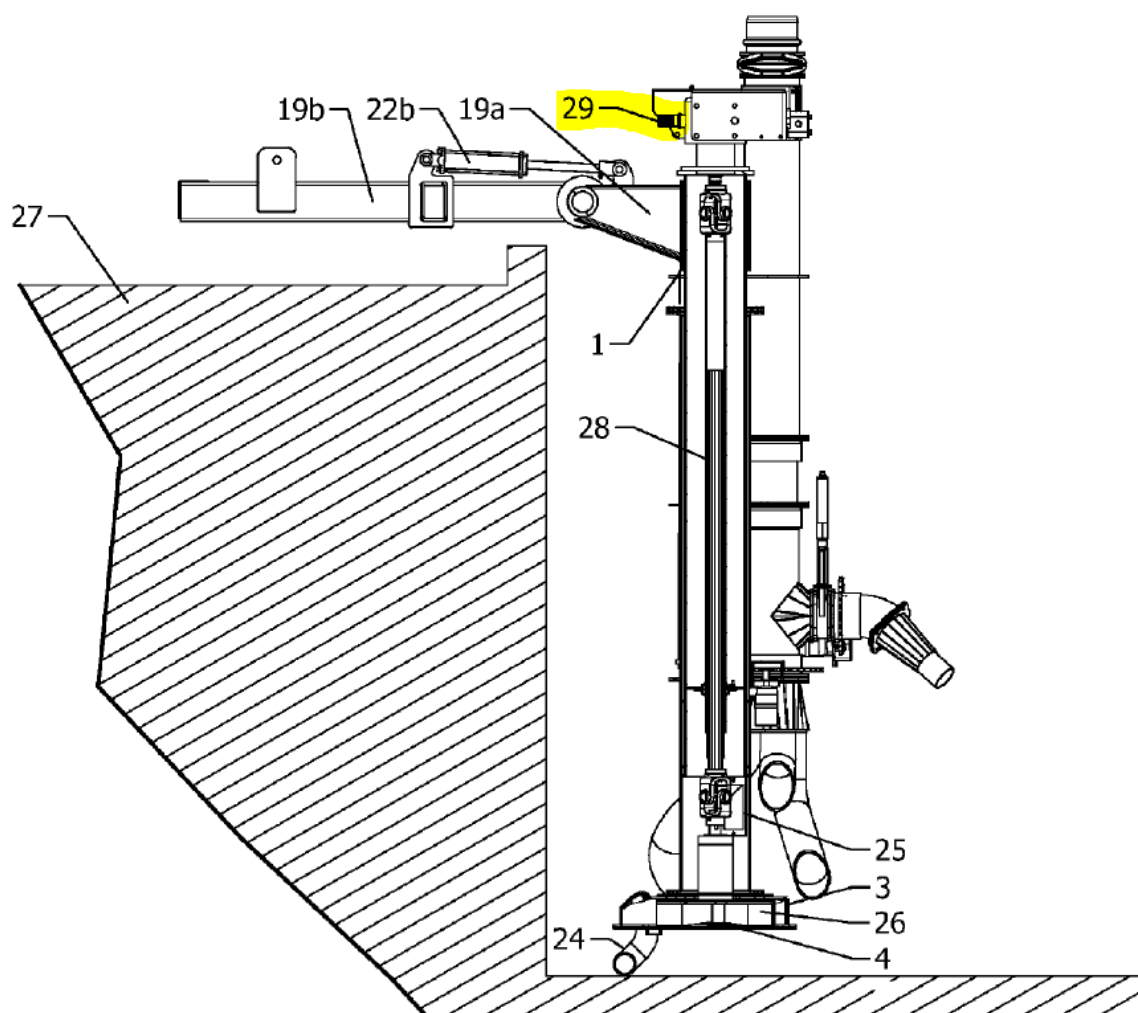


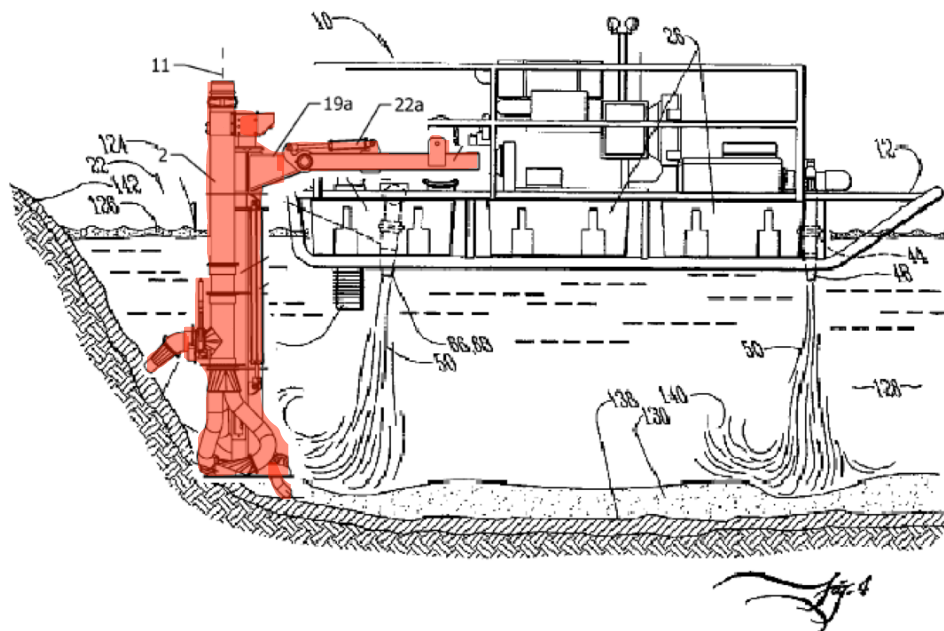
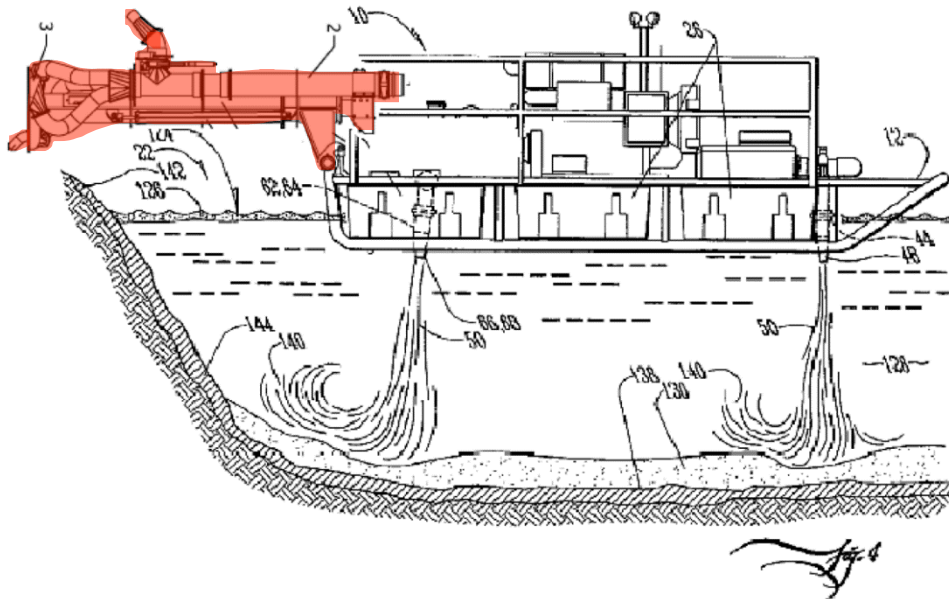
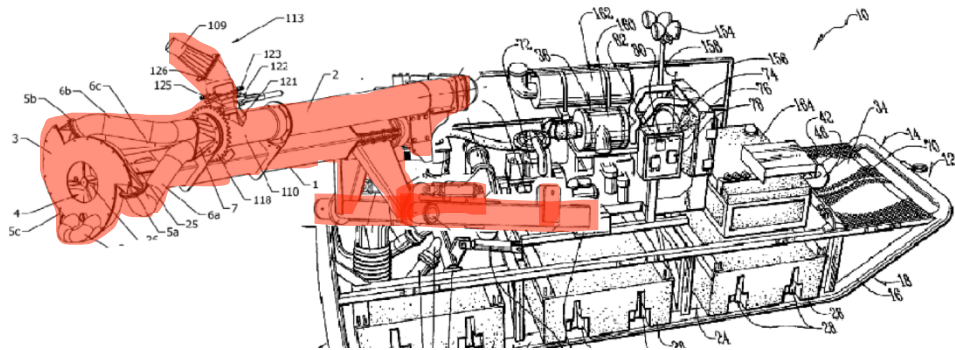
FIG. 2

EX2101, Fig. 2, p. 3.

174. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the boom arm to the rear of Puck's deck in such a way that the boom arm could pivot so the lower end is immersed in the manure and the upper end can mate with a drive shaft to receive power. As will be shown below, what would have been logical to a POSITA is to attach the pivot of arm 19a to the rear crossbar 16, 20 in Puck so that Nuhn's Pit Pump could pivot up and down in a similar manner to the way it operates when attached to the rear hitch of a tractor and so that the PTO connector 29 on the upper end of the

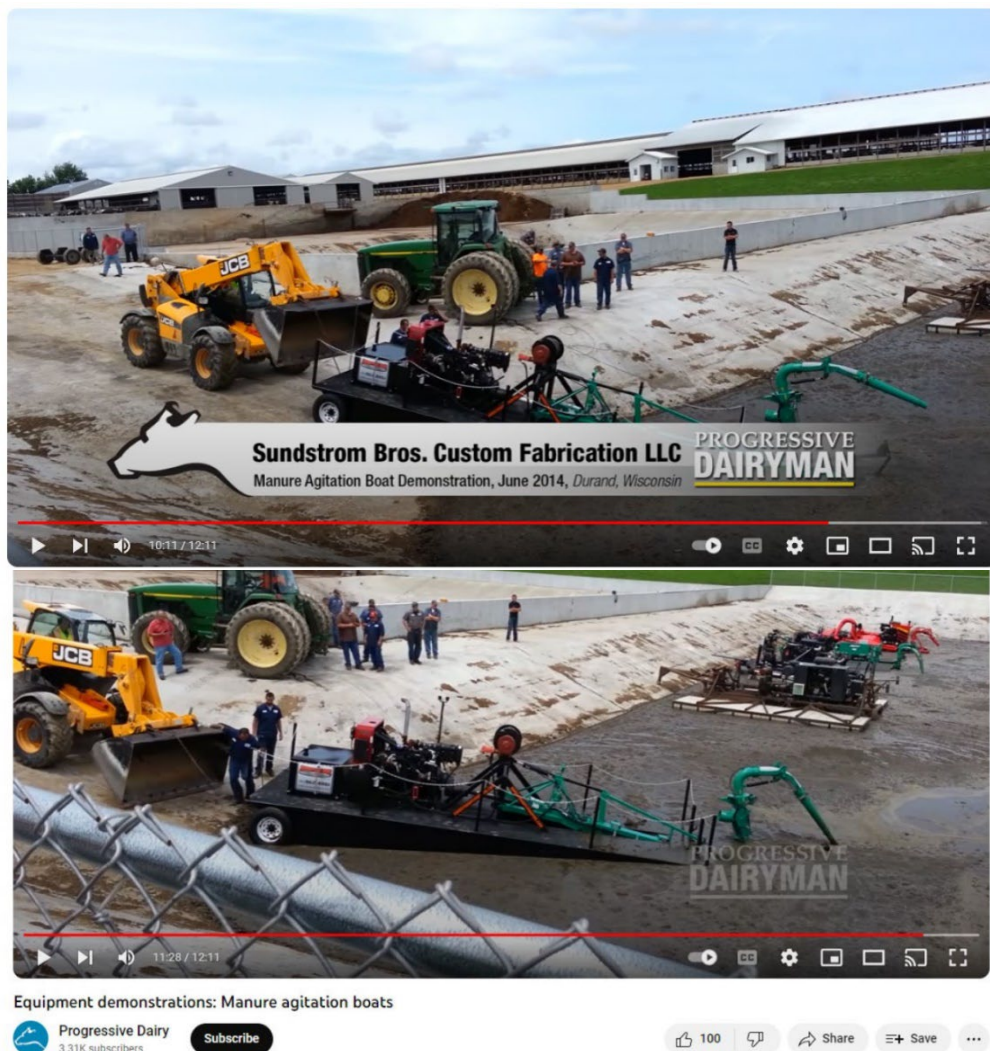
boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Puck's power source.

175. If a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump, then the resulting combination would look like this:



176. My opinion regarding how a POSITA would go about adding Nuhn's Pit Pump to Puck, if they were so motivated, is not based on speculation (like Dr. Winkel's opinion), but rather is based on record evidence. In particular, I note that both Sundstrom (EX1153, EX1154, EX1156) and the Puck Prototype (EX1159) show other POSITAs' attempts at adding boom-mounted pumps to manure agitation boats/barges. In both cases, Sundstrom and Puck retained the boom arm, pivot structure, and pivot functionality of the pumps so that the boom-mounted pump could be tilted down and up into and out of the lagoon.

177. Sundstrom's floating manure agitator included a GEA Houle liquid manure pump mounted on the front end of a long boom arm. The boom arm extends forward at an angle that can be tilted up and down to a limited degree.

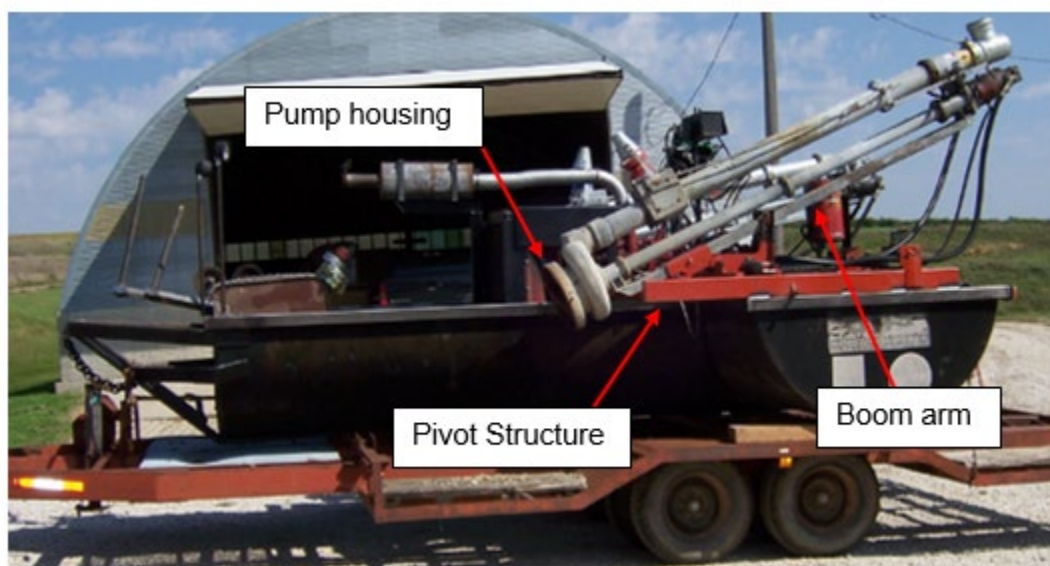


EX2008, 8-9.



EX1156, at 1.

178. The Puck Prototype included two submersible, boom-mounted pumps positioned on the right and left sides of the floating barge:



EX1159, p. 3 (annotated).



EX1159, p. 5.

As shown in the photographs above, the submersible pumps are mounted on the far end of a boom arm that can tilt/swing up and down and be lowered into and out of the manure lagoon.

179. Both Sundstrom and the Puck Prototype reflect what other POSITAs in the art actually did during the same approximate time period (i.e., same decade) as Nuhn's invention. This evidence leads me to the conclusion that a POSITA would have mounted Nuhn's Pit Pump to Puck's boat with little modification, if they were motivated to make such a combination in the first place, and that they would have retained the long 10ft boom arm, pivot structure, and pivot functionality of Nuhn's Pit Pump because that is entirely consistent with what Sundstrom and Puck actually did.

180. On the other hand, this record evidence does not support Petitioner's combination, which does away with the pivot structure and pivot functionality of Nuhn's Pit Pump, and either significantly shortens the boom arm or does away with it completely. None of those modifications were made by Sundstrom or Puck, let alone vertically orienting a submersible manure pump in a constant angular orientation relative the floatable vehicle body.

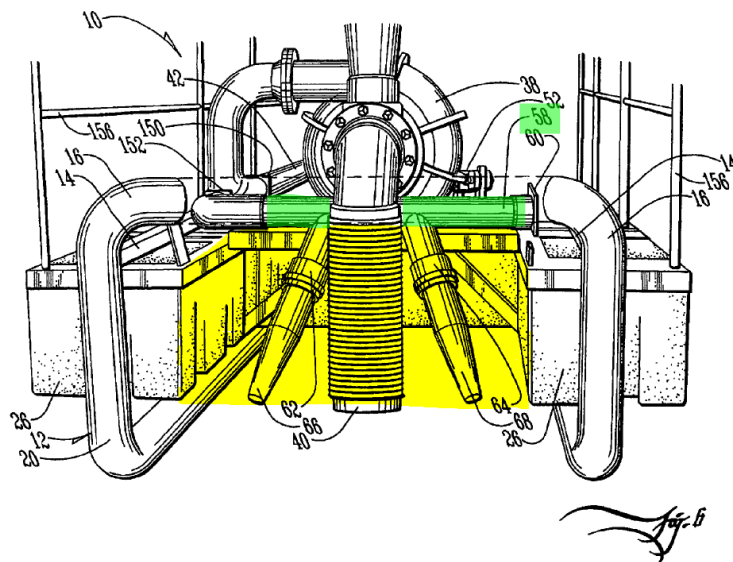
181. In view of the above analysis, if a POSITA were to add Nuhn's Pit Pump to Puck's boat, that combination would result in a pump at the far end of an articulating boom arm so that it could swing up and down in the same manner as when Nuhn's Pit Pump is attached to a tractor. Thus, the combination of Manure-Manager and Puck would not result in a vehicle where the liquid manure pump "has a constant angular orientation relative to the floatable vehicle body" as required by Substitute Claim 41.

3. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST THE CLAIMED POSITION OF THE LIQUID MANURE PUMP, WHERE SUBMERGED COMPONENTS OF THE VEHICLE ARE POSITIONED DIRECTLY FORWARD OF AND DIRECTLY REARWARD OF THE PUMP HOUSING ALONG THE LONGITUDINAL CENTERLINE

182. The Puck Combination fails to teach or suggest the position of the pump housing of the liquid manure pump recited in Substitute Claim 41, which requires submerged components of the vehicle to be positioned directly forward of and directly rearward of the pump housing along the longitudinal centerline of the floatable vehicle body:

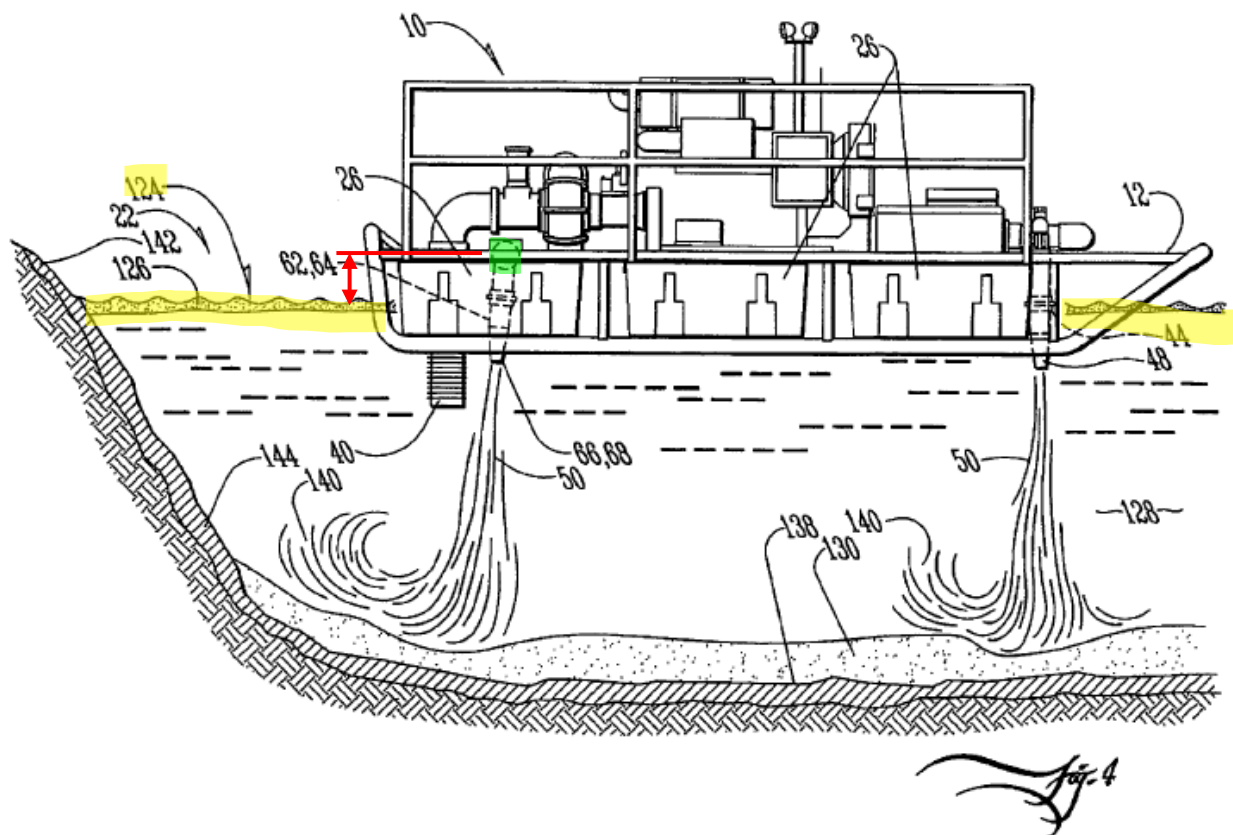
"wherein components of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump"

183. The rear of Puck's boat has a U-shaped cut-out between the floating dock sections (26) where the liquid manure intake pipe (40) is positioned, with a ninety-degree bend so that the intake pipe extends down into the manure lagoon.



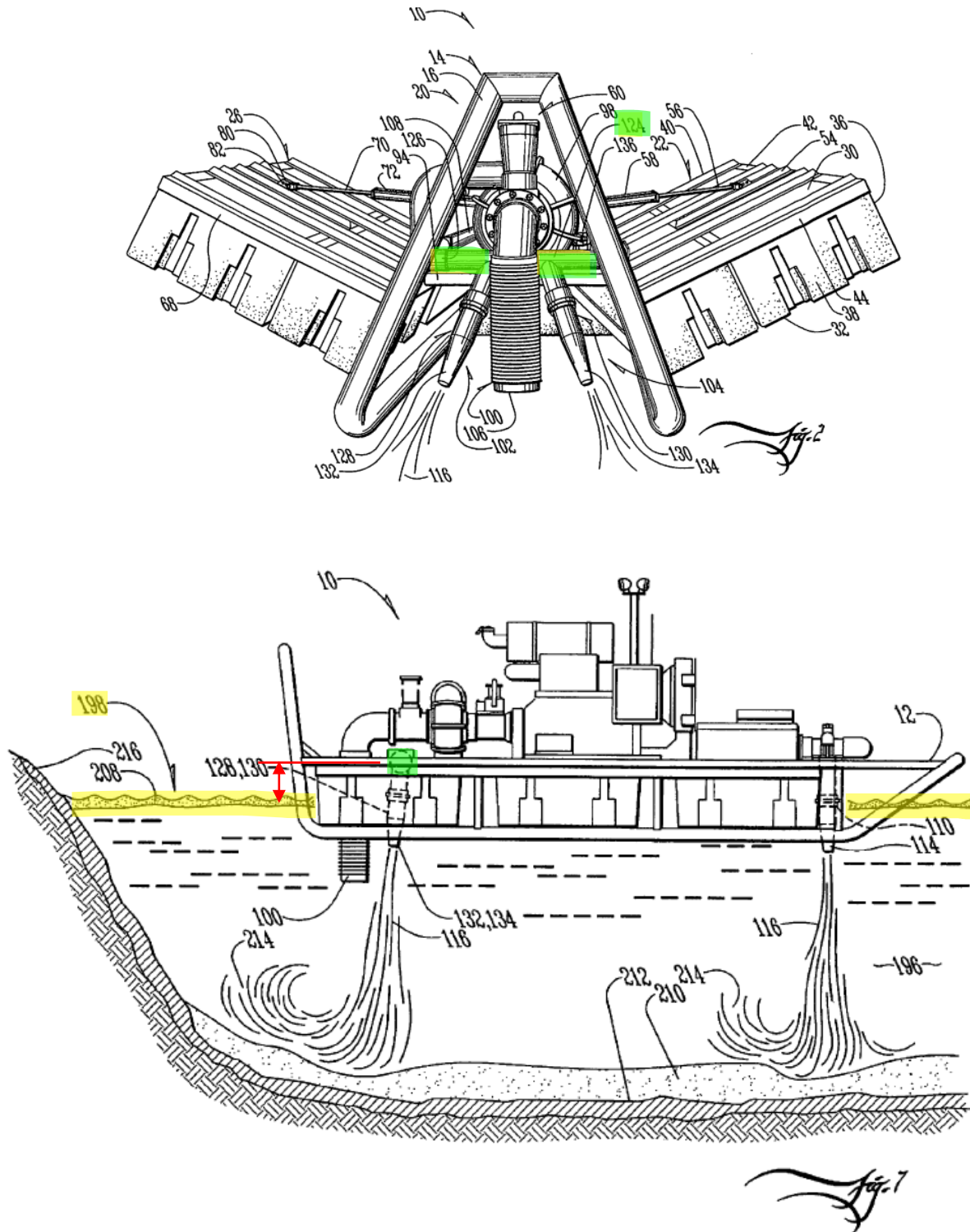
EX1014, Fig. 6, p. 7.

Even if a POSITA positioned Nuhn's Pit Pump in this space, as Petitioner suggests, there would be no submerged components that "are spaced from and positioned ... directly rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing", as required by the language of the Substitute Claim 41. This is due to the fact that the rear nozzle yoke 58 disclosed in Puck is **forward** of the intake pipe 40 and is not a submerged component when the vehicle is floating because the rear nozzle yoke 58 is spaced **above** the top of the buoyant elements 26 and therefore is above the surface 124 of the manure lagoon.



EX1014, Fig. 4, p. 5 (annotated).

184. The Puck Boat is the commercial embodiment of the vehicle described in U.S. Publication No. 2013/0145980 (EX2107, Puck II).

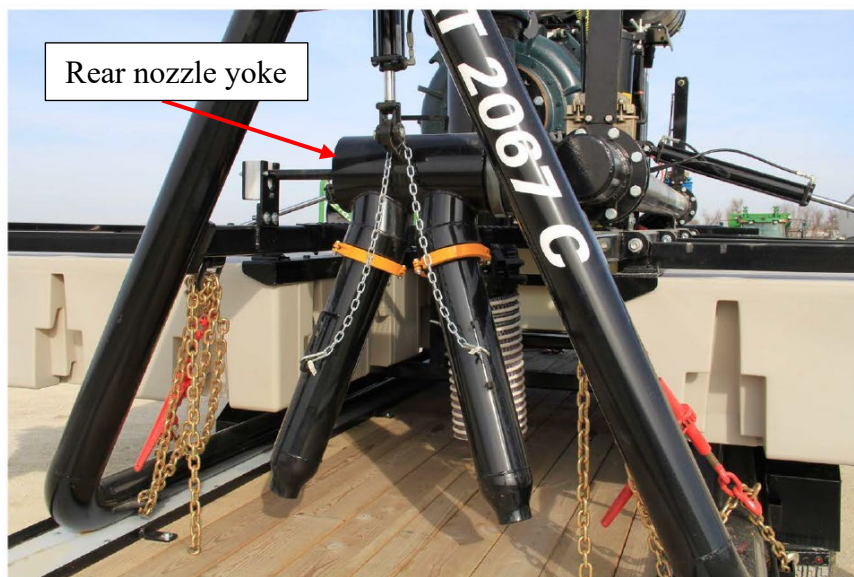


EX2107, Puck II, pp. 3 and 8 , FIGS. 2 and 7 (annotated).

As shown above, in Puck II, the rear nozzle yolk 124 is also positioned **forward** of the downwardly directed intake pipe 100 and is spaced **above** the top of the buoyant elements 36 and therefore is

above the surface 198 of the manure lagoon.

185. Unlike in Puck II, where the rear nozzle yolk 124 is positioned forward of the downwardly directed intake pipe 100, the rear nozzle yolk on the Puck Boat (i.e., the commercial embodiment) is positioned behind the downwardly directed intake pipe near the rear “A” frame structure.



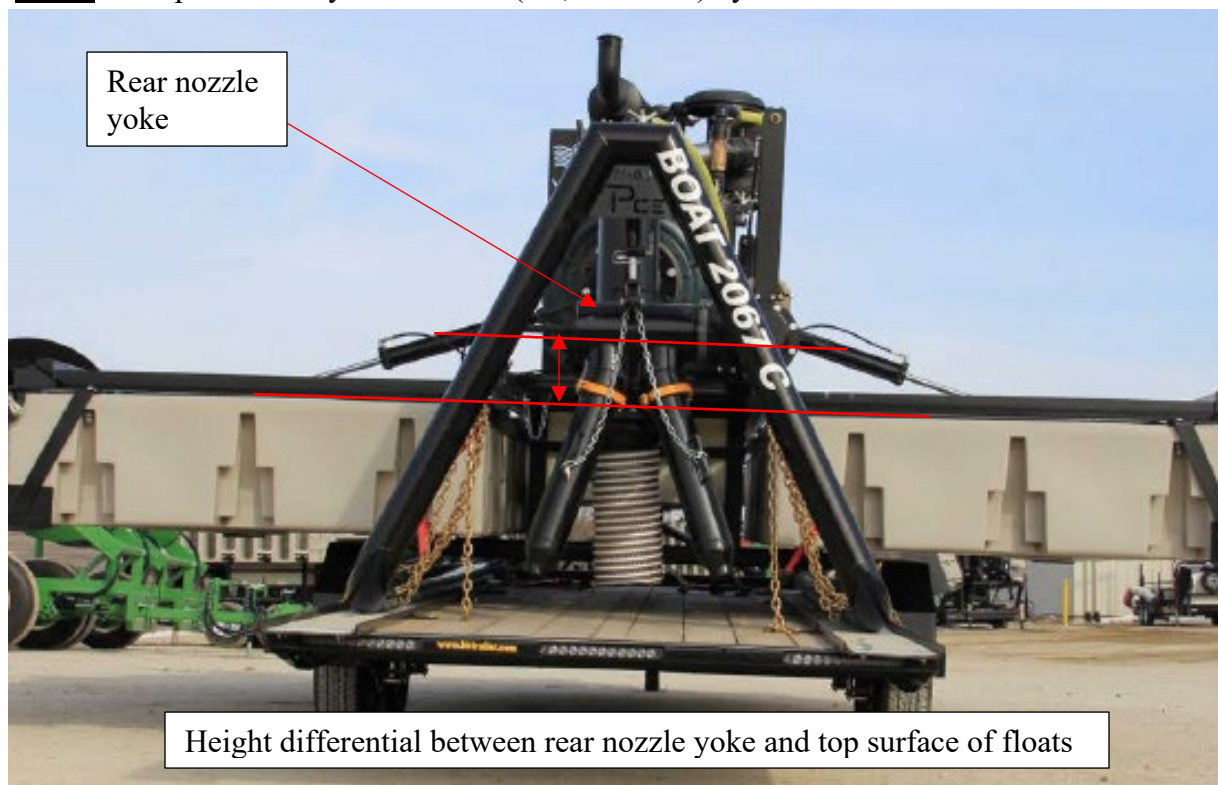
EX1164, p. 41 (annotated).

186. As discussed above, Nuhn’s Pit Pump is designed to swing up and down, which is a feature that a POSITA would have retained. A POSITA therefore would have positioned the rear nozzle yolk forward of Nuhn’s Pit Pump (like in the configuration disclosed in Puck II) so that the rear nozzle yolk would not interfere with the pivoting pump. In my opinion, a POSITA would not have selected the alternative configuration used on the Puck Boat, where the rear nozzle yolk is rearward of the downwardly directed intake pipe, because a POSITA would have recognized that Nuhn’s Pit Pump would contact the rear nozzles and/or rear nozzle yolk when pivoted upward and to the rear of the boat for storage, transport, launching, and retrieval. This interference would have significantly limited the angle one could tilt Nuhn Pit Pump upward – a problem that would be avoided by selecting the position of the rear nozzle yolk disclosed in Puck II. As a result, a POSITA would have logically followed the teachings of Puck II’s rear nozzle

placement instead of the alternative location for the rear nozzles on Puck's Boat.

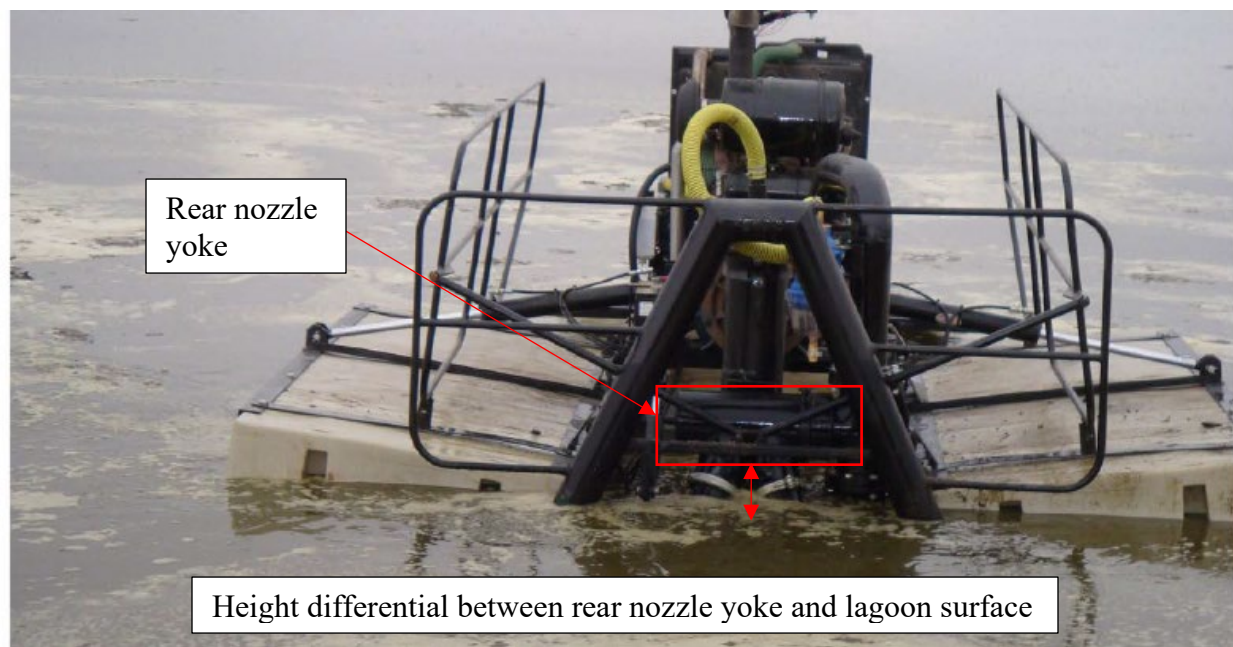
187. But even if a POSITA would have selected the placement of the rear nozzle yoke used on the Puck Boat (i.e., Puck's commercial embodiment), this is not a submerged component of the vehicle nor is it directly rearward of the pump housing as required by the language of Substitute Claim 41.

188. Like in Puck and Puck II, the rear nozzle yoke used on the Puck Boat is spaced above the top of the buoyant elements (i.e., the floats) by several inches.

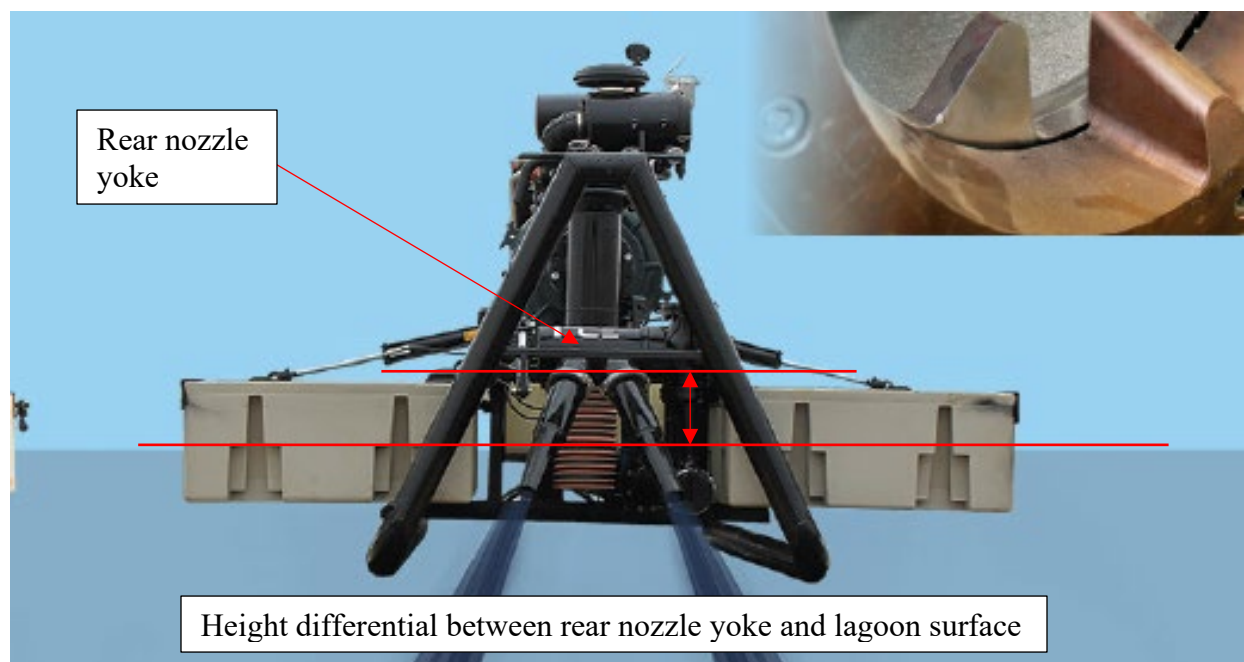


EX1164, p. 18 (annotated).

189. The top of the buoyant elements (floats) are not submersed when the Puck Boat is floating so a POSITA would not understand the rear nozzle yoke to be a submerged component of the vehicle, as required by Substitute Claim 41.



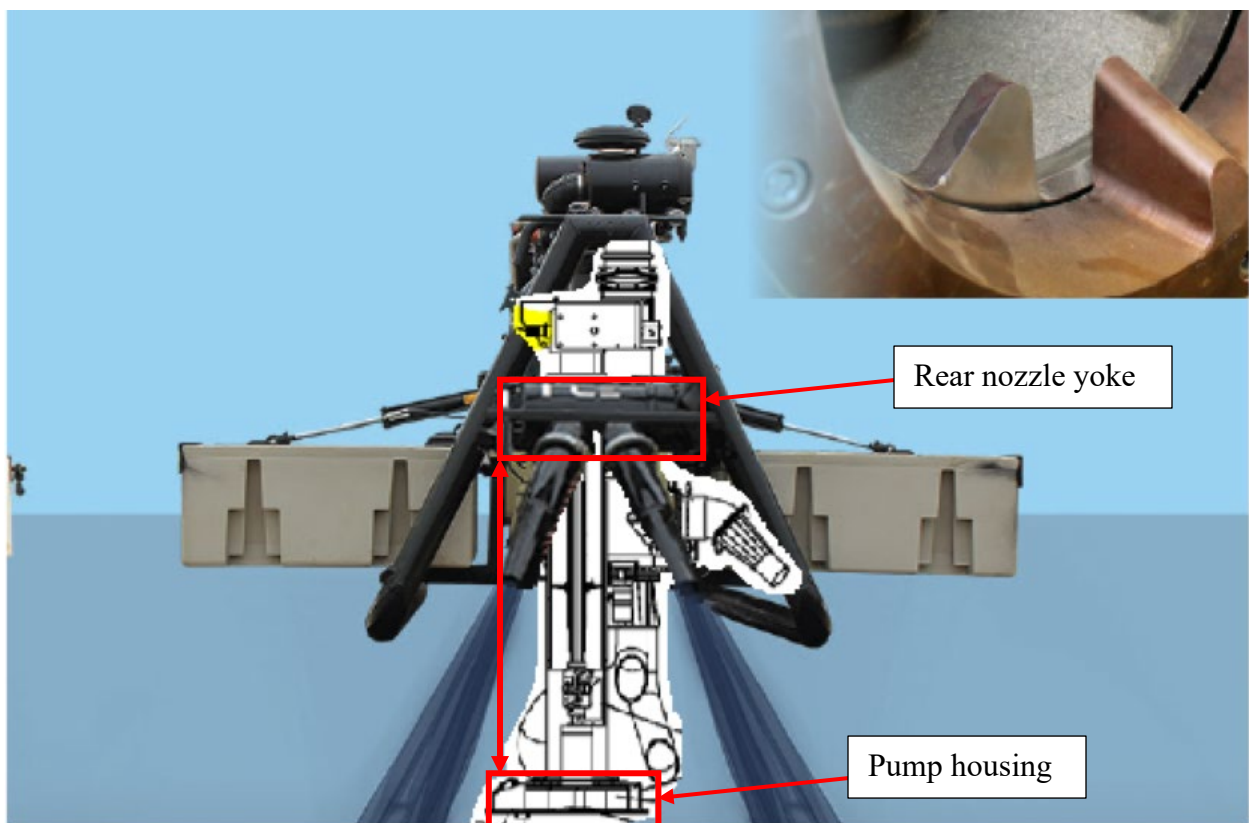
EX1169, p. 2 (annotated).



EX1160, p. 2 (annotated).

190. The photographs above demonstrate that the rear nozzle yoke of the Puck Boat cannot be fairly characterized as one of the “components of the vehicle that are submerged when the vehicle is floating”, as Substitute Claim 41 requires.

191. Nor would the rear nozzle yoke of the Puck Boat be positioned “directly rearward of the pumping housing” if the proposed combination were adopted. Dr. Winkel asserts that a POSITA would shorten Nuhn’s Pit Pump and place it in the location of Puck’s downwardly directed intake pipe. So the combination would look something like this:



EX1160, p. 2 (annotated). A POSITA would not consider the rear nozzle yoke of the Puck Boat as being “directly rearward of the pump housing” due to the height differential between the components. Even if the pump housing were positioned along the bottom of the buoyant elements (floats), the rear nozzle yoke would be vertically spaced above the pump housing, rather than directly rearward of the pump housing, because the rear nozzle yoke is spaced above the top of the buoyant elements (floats).

192. A POSITA would understand the language of Substitute Claim 41 requiring a submerged component of the vehicle to be “directly rearward” of the pump housing as defining a three-dimensional geometric relationship where the submerged component of the vehicle must be behind the pump housing and must be at substantially the same height (i.e., submerged depth) and substantially the same lateral position (i.e., not offset to the right or left) as the pump housing. This stands in contrast to the language of Substitute Claim 57, where the submerged component need only be “rearward of the pump housing along the longitudinal centerline,” which a POSITA would understand as defining a two-dimensional geometric relationship where the submerged component must be behind the pump housing and must have the same lateral position (i.e., not offset to the right or left) as the pump housing. In other words, because Substitute Claim 57 does not use to phrase “directly rearward”, it does not require the submerged component to be at substantially the same height/depth as the pump housing, it just needs to be submerged and positioned on the longitudinal centerline of the floatable vehicle body.

193. Thus, even if the boom arm of Nuhn’s Pit Pump were substantially shortened, as Petitioner argues (and shown above), the rear nozzle yoke of the Puck Boat would still be spaced well above the pump housing and there would be an **unobstructed** path to the pump housing from the rear (i.e., when viewed from the rear, the rear nozzle yoke would not obstruct from view any portion of the pump housing, which the claims define as the structure that houses the impeller.) A POSITA would not understand there to be a submerged component “directly rearward of the pump housing” in view of this unobstructed path/view to the pump housing from the rear of the boat.

194. Furthermore, as a result of this height differential and unobstructed path to the pump housing from the rear of the boat, the rear nozzle yoke would not be positioned to “keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump” as Substitute Claim 41 requires.

195. In view of the above analysis, if a POSITA were to add Nuhn’s Pit Pump to Puck and adopt the location of the rear nozzle yoke used on the Puck Boat (i.e. the commercial

embodiment), the combination would still fall short of the configuration recited in Substitute Claim 41, where “components of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump” as required by Substitute Claim 41.

196. I also disagree with Dr. Winkel’s alternative argument that a POSITA would add a floating dock section (i.e., buoyant element) behand the pump housing of Nuhn’s Pit Pump. This argument is entirely hindsight bias, as it is not taught or suggested by any prior art reference or other record evidence.

**4. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST A
“HYDRAULICALLY POWERED LIQUID MANURE MOVER” AND A
“POWER SOURCE CONFIGURED TO PROVIDE POWER TO BOTH THE
GROUND ENGAGING PROPULSION STRUCTURE AND THE LIQUID
MANURE MOVER”**

197. Neither Puck, the Puck Boat, Bryham, or Manure-Manager disclose “a hydraulically powered liquid manure mover” and “a power source that provides power to both the ground engaging propulsion structure and the liquid manure mover” as required by the language of Substitute Claim 41.

198. The manure pumps in Puck and the Puck Boat are mechanically powered as is Nuhn’s Pit Pump.

199. With respect to the hydraulic system, Puck discloses a hydraulic pump 54 that is powered by a 12-volt battery 56. EX1014, Para. [0027]. A POSITA would have recognized that such a system would not be capable of powering any manure pump, let alone Nuhn’s Pit Pump, which requires a minimum of 95 horsepower. EX2115, p. 2. As a result, a POSITA would have installed Nuhn’s Pit Pump such that its input shaft could be coupled to and mechanically powered by Puck’s engine, if they were motivated to make the combination in the first place.

200. Dr. Winkel attempts to correct this by now making the unsupported argument that Bryham’s hydraulic system could somehow be used to power both the ground engaging wheels and Nuhn’s Pit Pump. EX1174, ¶59. But Dr. Winkel has not shown that a POSITA would expect Bryham’s hydraulic system to be capable of powering Nuhn’s Pit Pump. The record suggests that it would not.

201. Maurice Bryham testified in his deposition that the optional firefighting pump they used in some of their vehicles was powered by a secondary inboard engine with an effective output of 24 horsepower. EX1176, pp. 111, 117. A POSITA would not reasonably expect Bryham’s secondary inboard engine and hydraulic system to be capable of powering Nuhn’s Pit Pump when Bryham’s system had an output of about 24 horsepower and Nuhn’s Pit Pump had a minimum of 95 horsepower.

202. In view of the above analysis, if a POSITA were to add Nuhn’s Pit Pump to Puck, they would have mechanically driven Nuhn’s Pit Pump by coupling the input drive shaft on Nuhn’s Pit Pump to the output shaft of Puck’s motor. Thus, the result of this combination would not have been a hydraulically powered liquid manure mover where “a power source that provides power to both the ground engaging propulsion structure and the liquid manure mover” as required by the language of Substitute Claim 41.

5. THE PUCK COMBINATION FAILS TO DISCLOSE “WIRELESS REMOTE CONTROL CONFIGURED TO ... (1) CONTROL THE GROUND ENGAGING PROPULSION STRUCTURE”

203. Puck’s remote-control system is limited to turning the engine on and off, controlling engine speed, turning the nozzles on and off, and controlling nozzle direction. *See* EX1014, Puck, ¶¶ [0032]-[0033]. Puck also lacks any sort of ground engaging propulsion structure. As a result, Puck’s remote-control system does not provide “wireless remote control configured to enable an operator who is remote from the vehicle to ... (1) control the ground engaging propulsion structure” as required by the language of Claim 41. And Bryham lacks any discussion of remote

control and therefore fails to supply this element missing from Puck.

204. Dr. Winkel argues that a POSITA would have been motivated to configure the remote-control steering system of Puck (used while the boat of Puck is floating) to control the speed and direction of Bryham's wheels while the vehicle is ground engaging. EX1004, Winkel Decl., ¶¶349-350. But this argument fails to address whether a POSITA would have a reasonable expectation that Puck's remote-control system for controlling movement while floating in the manure lagoon could be successfully modified and used for control over Bryham's steering and propulsion system (i.e., Bryham's wheels) while Puck's boat is on the ground. Again, POSITA would understand that just because *some* vehicles can be remote controlled does not mean that *all* vehicles can be remote controlled.

B. Claim 42

205. Claim 42 depends from Claim 41 and recites: "The vehicle according to claim 41, wherein the ground engaging propulsion structure comprises a set of ground engaging wheels or endless tracks." As described above, the Puck Combination does not render Claim 41 obvious. Claim 42 is not obvious at least because of its dependence on Claim 41.

C. Claim 43

206. Claim 43 depends from Claim 41 and recites: "The vehicle according to claim 41, wherein the power source is configured to provide hydraulic fluid power to both the ground engaging propulsion structure and the liquid manure mover." As described above, the Puck Combination does not render Claims 41 obvious. Claim 43 is not obvious at least because of its dependence on Claim 41.

D. Claim 44

207. Claim 44 depends from Claim 43 and recites: "The vehicle according to claim 43, wherein the ground engaging propulsion structure is operable at variable speed by the hydraulic motor." As described above, the Puck Combination does not render Claims 41 and 43 obvious.

Claim 44 is not obvious at least because of its dependence on Claims 41 and 43.

E. Claim 45

208. Claim 45 depends from Claim 41 and recites: “The vehicle according to claim 41, wherein the least one fluid–nozzle is fluidly-connected to the at least one fluid conduit.” As described above, the Puck Combination does not render Claim 41 obvious. Claim 45 is not obvious at least because of its dependence on Claim 41.

F. Claim 46

209. Claim 46 depends from Claim 45 and recites: “The vehicle according to claim 45, wherein the at least one fluid nozzle comprises a plurality of fluid nozzles that are fluidly-connected to the at least one fluid conduit.” As described above, the Puck Combination does not render Claims 41 and 45 obvious. Claim 46 is not obvious at least because of its dependence on Claims 41 and 45.

G. Claim 47

210. Claim 47 depends from Claim 45 and recites: “The vehicle according to claim 45, wherein the amount of fluid flow from the at least one fluid nozzle and the direction of the at least one fluid nozzle are remotely controllable by the operator remote from the vehicle when the vehicle is floating.” As described above, the Puck Combination does not render Claims 41 and 45 obvious. Claim 47 is not obvious at least because of its dependence on Claims 41 and 45.

H. Claim 48

211. Claim 48 depends from Claim 41 and recites: “The vehicle according to claim 41, wherein the location of the ground engaging propulsion structure, the power source, and the immersible liquid manure pump are selected to provide a desired location for a center of gravity of the vehicle.” As described above, the Puck Combination does not render Claim 41 obvious. Claim 48 is not obvious at least because of its dependence on Claim 41.

I. Claim 49

212. Claim 49 depends from Claim 41 and recites: “The vehicle according to claim 41, further comprising an angle adjustment structure configured to adjust an angular orientation of the at least one fluid nozzle of the liquid manure mover.” As described above, the Puck Combination does not render Claim 41 obvious. Claim 49 is not obvious at least because of its dependence on Claim 41.

J. Claim 50

213. Claim 50 depends from Claim 49 and recites: “The vehicle according to claim 49, wherein the angle adjustment structure comprises a hydraulically powered articulation means.” As described above, the Puck Combination does not render Claims 41 and 49 obvious. Claim 50 is not obvious at least because of its dependence on Claims 41 and 49.

K. Claim 51

214. Claim 51 depends from Claim 50 and recites: “The vehicle according to claim 50, wherein the hydraulically powered articulation means comprises a hydraulic cylinder.” As described above, the Puck Combination does not render Claims 41, 49, and 50 obvious. Claim 51 is not obvious at least because of its dependence on Claims 41, 49, and 50.

L. Claim 52

215. Claim 52 depends from Claim 50 and recites: “The vehicle according to claim 50, wherein the angle adjustment structure comprises a four bar linkage connected to the hydraulically powered articulation means to extend the effective stroke length of the hydraulically powered articulation means.” As described above, the Puck Combination does not render Claims 41, 49, and 50 obvious. Claim 52 is not obvious at least because of its dependence on Claims 41, 49, and 50.

M. Claim 53

216. Claim 53 depends from Claim 49 and recites: “The vehicle according to claim 49,

wherein the angle adjustment structure adjusts the angular orientation of the at least one fluid nozzle of the liquid manure mover in a vertical plane.” As described above, the Puck Combination does not render Claims 41 and 49 obvious. Claim 53 is not obvious at least because of its dependence on Claims 41 and 49.

N. Claim 54

217. Claim 54 depends from Claim 50 and recites: “The vehicle according to claim 50, wherein the angle adjustment structure adjusts the angular orientation of the at least one fluid nozzle of the liquid manure mover in a vertical plane.” As described above, the Puck Combination does not render Claims 41, 49, and 50 obvious. Claim 54 is not obvious at least because of its dependence on Claims 41, 49, and 50.

O. Claim 55

218. Claim 55 depends from Claim 49 and recites: “The vehicle according to claim 49, wherein the angle adjustment structure adjusts the angular orientation of the at least one fluid nozzle of the liquid manure mover in a horizontal plane.” As described above, the Puck Combination does not render Claims 41 and 49 obvious. Claim 55 is not obvious at least because of its dependence on Claims 41 and 49.

P. Claim 56

219. Claim 56 depends from Claim 50 and recites: “The vehicle according to claim 50, wherein the angle adjustment structure adjusts the angular orientation of the at least one fluid nozzle of the liquid manure mover in a horizontal plane.” As described above, the Puck Combination does not render Claims 41, 49, and 50 obvious. Claim 56 is not obvious at least because of its dependence on Claims 41, 49, and 50.

Q. Claim 57

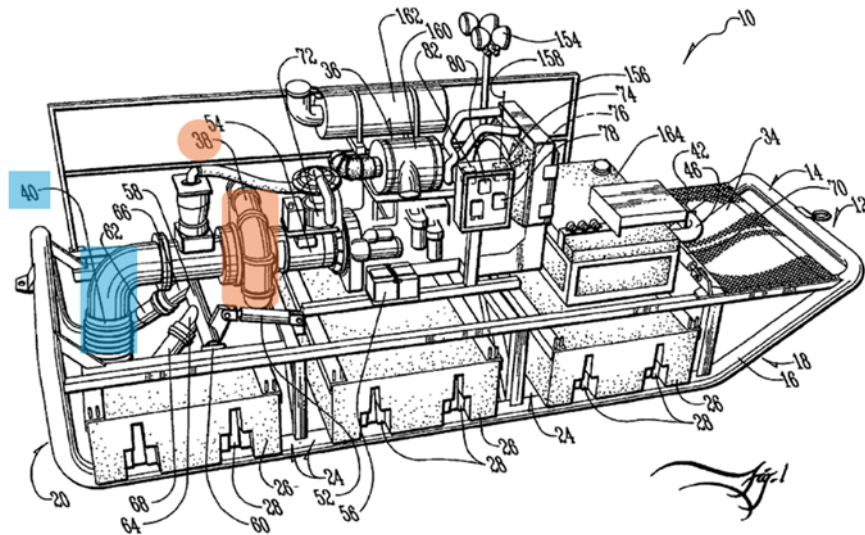
1. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST THE CLAIMED POSITION OF THE LIQUID MANURE PUMP, WHERE THE PUMP

**HOUSING AND IMPELLER ARE POSITIONED ALONG THE UNDERSIDE OF
THE FLOATABLE VEHICLE BODY**

220. The Puck Combination fails to teach or suggest the position of the pump housing and impeller of the liquid manure pump recited in Substitute Claim 57, which requires those components to be positioned along the underside of the floatable vehicle body:

“the pump housing and the impeller are positioned along the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body”

221. Puck discloses a manure agitation boat including a slurry pump (38) that is located well above the floating dock sections (26). As a result, the pump housing in orange in the annotated figures below, and the impeller contained in the pump housing, is spaced above the underside of the floatable vehicle body:



EX1014 at 2 (annotated).



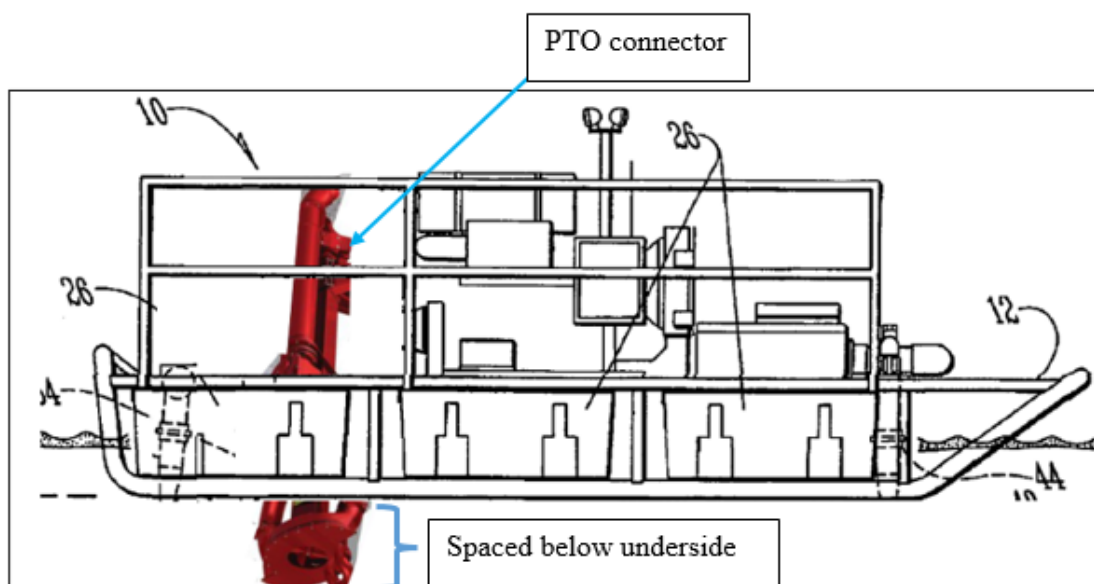
EX1014 at 5, 7 (annotated).

222. A liquid manure intake (40), shown in blue in the annotated figures above, extends towards a reward end of the boat, with a ninety-degree bend downward towards the bottom of the boat. The housing and impeller of the pump (38) are separate and distinct from the intake pipe (40)

and are not located on the underside of the boat. Non-immersible liquid manure pumps (like the one disclosed in Puck), require different inlet/housing configurations with pump priming structures compared to submersible pumps. EX1014 at [0031].

223. A POSITA looking to the teachings of Puck when attempting to design a new manure lagoon agitation vehicle would logically follow its disclosure, which teaches placing a non-submersible pump high and dry on top of the floatable vehicle body. Puck does not teach or suggest the claimed arrangements where the liquid manure pump is positioned along the underside of the floatable vehicle body.

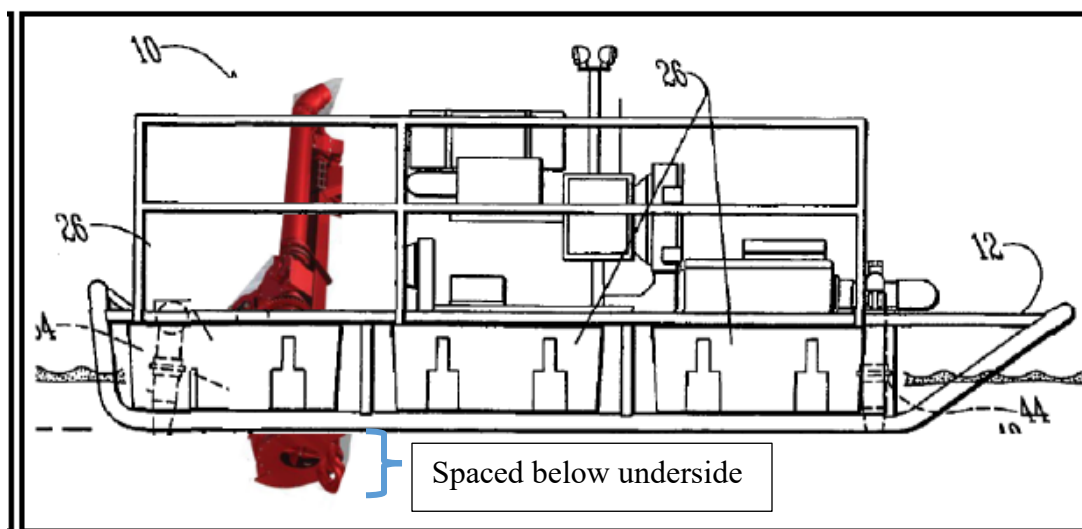
224. I disagree with Dr. Winkel's combination of Manure-Manager with Puck, as shown below, because Dr. Winkel advocates mounting Nuhn's Pit Pump in a location that would be



illogical to a POSITA based on the teachings of Manure-Manager and Puck.

EX1109 in IPR2023-01161, ¶143.

Dr. Winkel attempts to correct this in the present IPR, by moving the pump even higher, but these modifications are illogical absent hindsight bias and are contrary to other record evidence (e.g., EX1156 and EX1159) showing how a POSITA would have added Nuhn's Pit Pump to Puck around the time of the invention, if they were motivated to do so.



EX1174, ¶44.

225. The boom arm of Nuhn's Pit Pump is approximately 10 feet long and is therefore much larger than what is shown above. So even if Dr. Winkel's combination were adopted, the pump housing and impeller would still be spaced well below the underside of the floatable vehicle body by several feet. In other words, a POSITA would not consider the combination shown in the image presented above as a vehicle where the pump housing and impeller are "positioned along the underside of the floatable vehicle body" as required by Substitute Claim 57.

226. Manure-Manager teaches a POSITA to locate a submersible manure pump at the lower end of a boom arm. The upper end of the boom arm opposite the manure pump is configured to be attached to the three-point mount on a tractor and the manure pump is powered/driven by the power-take-off (PTO) of the tractor, which couples to a driveshaft located at the upper end of the boom arm:



EX1088, p. 27.

227. Fig. 2 of Nuhn's '758 Patent clearly depicts the PTO connector 29 at the upper end of the boom arm 1 where the driveshaft couples the PTO of the tractor to the gearbox of Nuhn's Pit Pump:

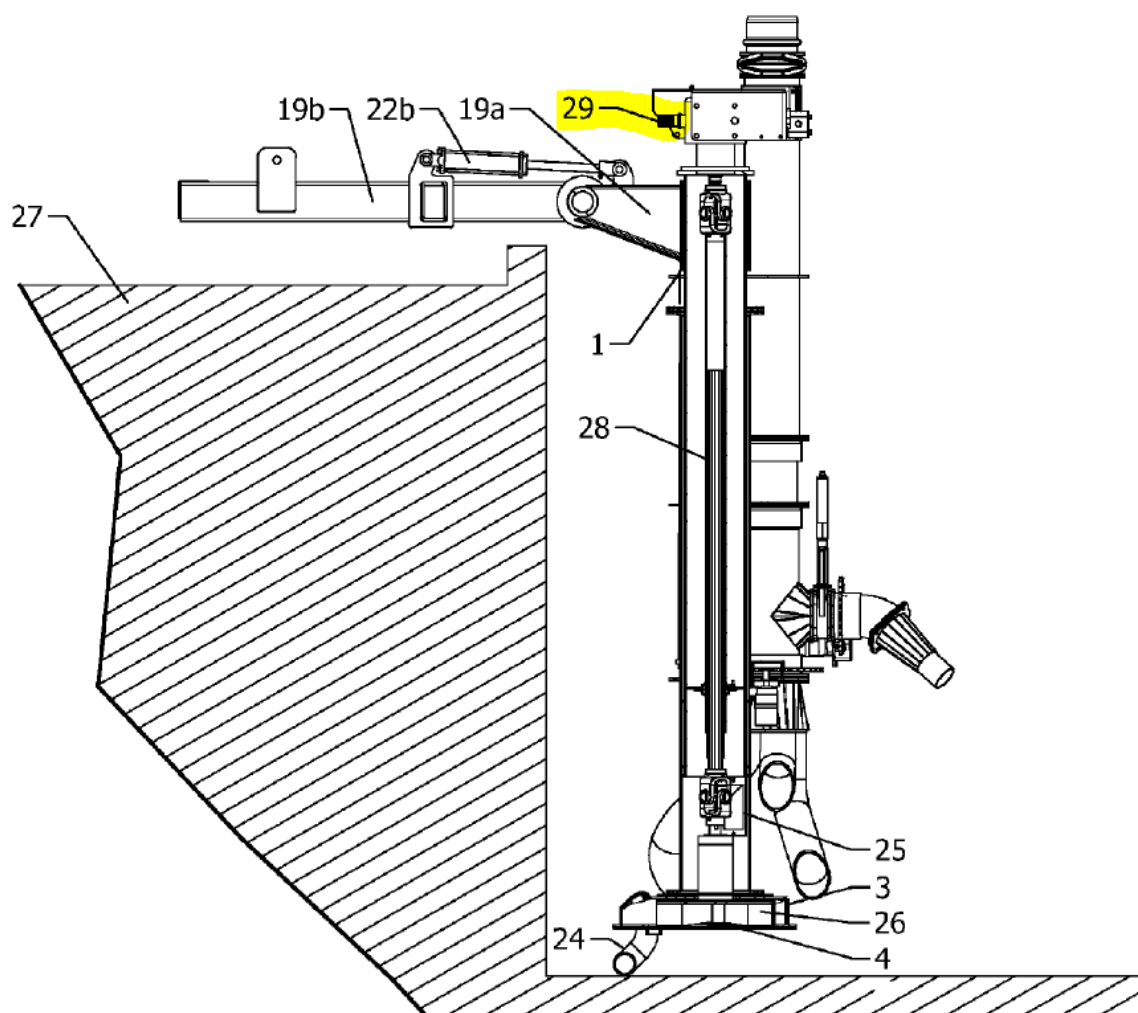
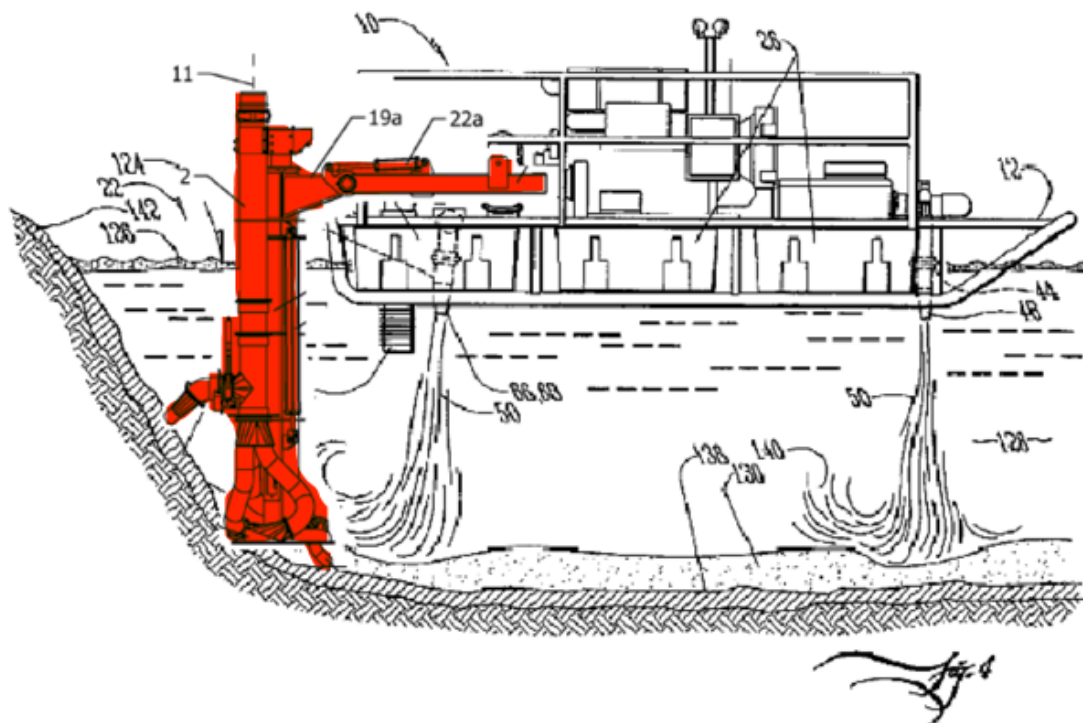


FIG. 2

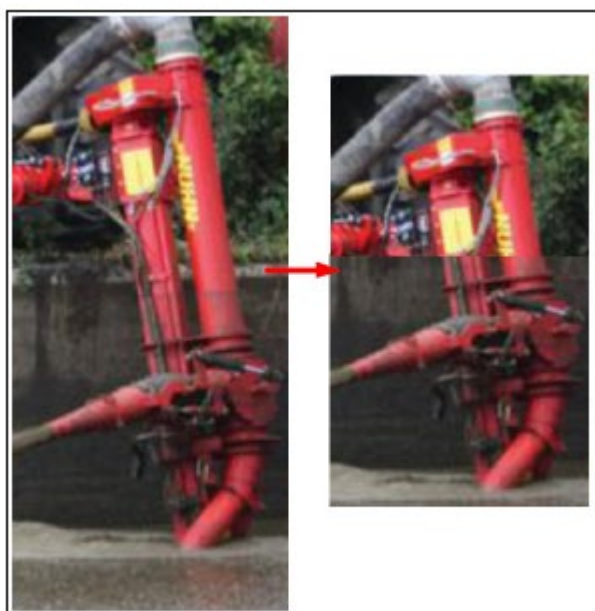
EX2101, Fig. 2.

228. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the pivot of arm 19a to the rear of Puck's deck so that the PTO connector 29 on the upper end of the boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Puck's power source.

229. If a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump, then the resulting combination would look like this:

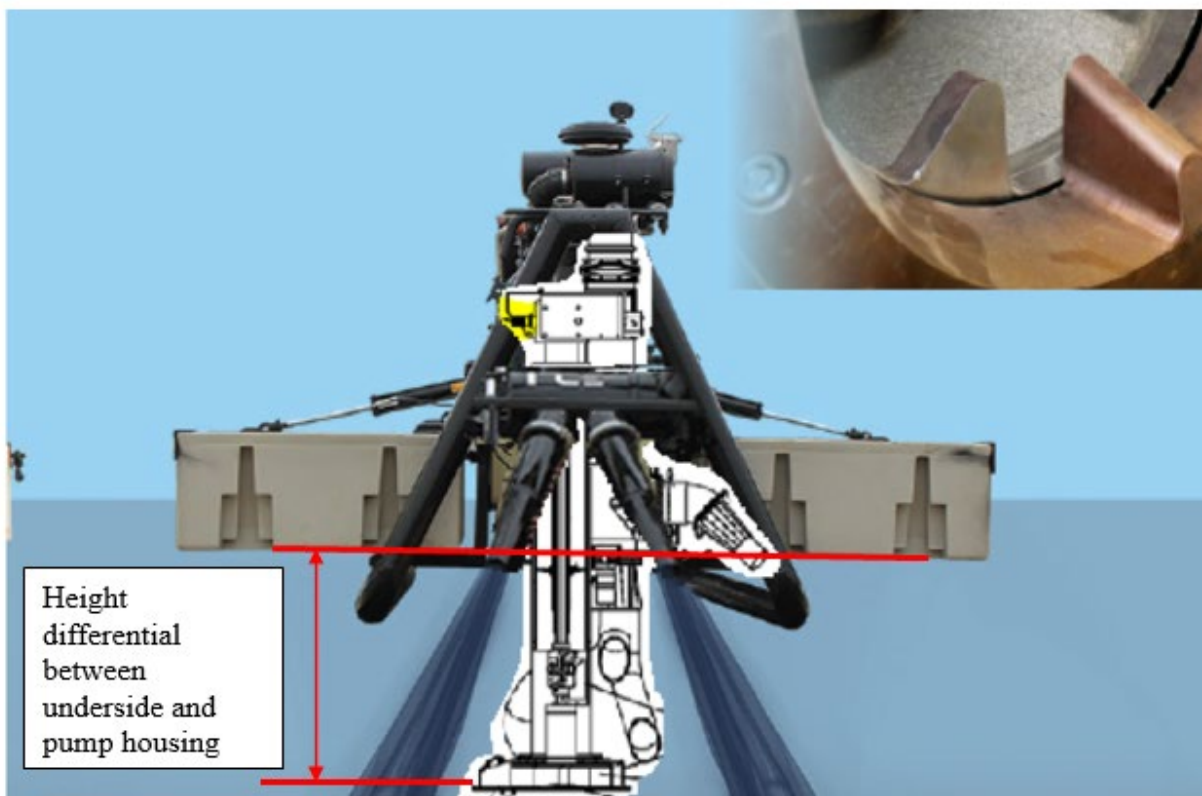


230. In an attempt to address his flawed reasoning, Dr. Winkel argues that a POSITA would shorten the boom arm of Nuhn's Pit Pump, as shown in the photoshopped image below:



EX1174, ¶58.

Dr. Winkel has not cited any evidence that a POSITA would reasonably expect this modification to even be feasible, but even setting that aside, the structure above the pump housing on Nuhn's Pit Pump, including the conduits leading from the pump outlets to the nozzle, the gear box, and the rotation system, all take up significant space (of several feet), and would therefore limit Winkel's theoretical shortening of the boom arm. In the image above, Dr. Winkel has roughly shortened the boom arm by 2-3 feet (from 10 feet to 7-8 feet). Even if this shortening were performed, the result would still be a pump housing and impeller spaced several feet below the underside of Puck's boat.



EX1160, p. 2 (annotated).

231. In view of the above analysis, if a POSITA were to add Nuhn's Pit Pump to Puck's

boat, that combination would result in a pump at the far end of a boom arm at a location spaced several feet below the underside of Puck's boat. Thus, the Puck Combination would not result in a vehicle where "the pump housing and impeller are positioned along the underside of the floatable vehicle body" as required by Substitute Claim 57.

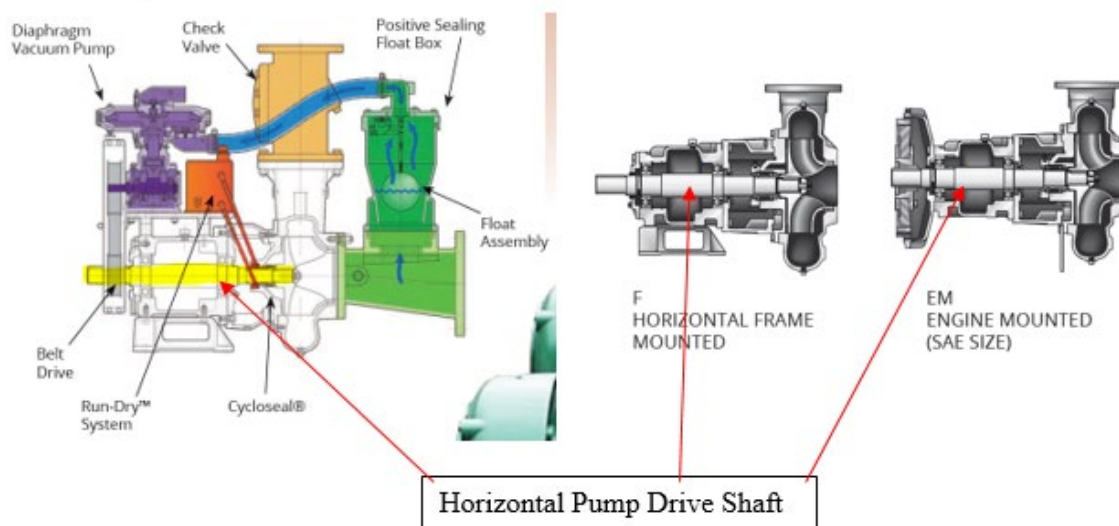
2. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST A LIQUID MANURE PUMP HAVING A VERTICAL DRIVESHAFT AND A CONSTANT ANGULAR ORIENTATION

232. The Puck Combination fails to teach or suggest the fixed orientation of the liquid manure pump recited in Substitute Claim 57, which requires the liquid manure pump to have a substantially vertical driveshaft powering an impeller and a constant angular orientation:

"the immersible liquid manure pump of the liquid manure mover including a substantially vertical drive shaft powering an impeller"

"such that the immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating in a manure lagoon and has a constant angular orientation relative to the floatable vehicle body"

233. As discussed above, Puck discloses an agitation boat including a slurry pump (38) that is illustrated on top of the boat hull at a location that is high above the surface of a manure lagoon. The slurry pump (38) in Puck is mechanically powered by a horizontal drive shaft and has



a rear-facing fluid opening in the back of the pump housing.

EX1143 at 2, 7 (annotated).

234. Puck does not teach or suggest the claimed arrangements where the liquid manure pump has a substantially vertical drive shaft.

235. Manure-Manager teaches a POSITA to locate a submersible manure pump at the lower end of an articulating boom arm that swings / pivots up and down:

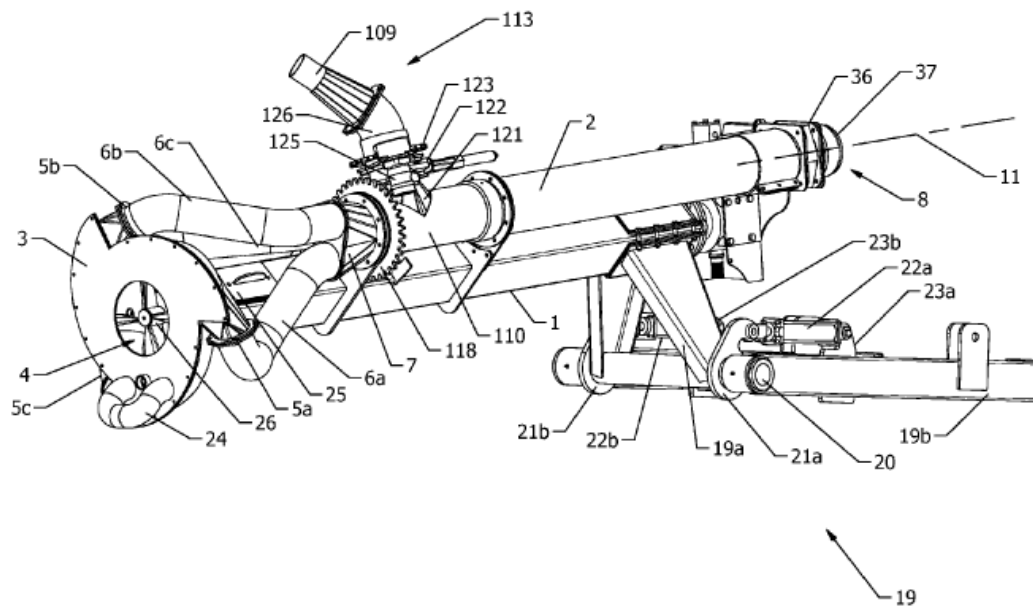


FIG. 1

EX2101, Fig. 1, p. 2.

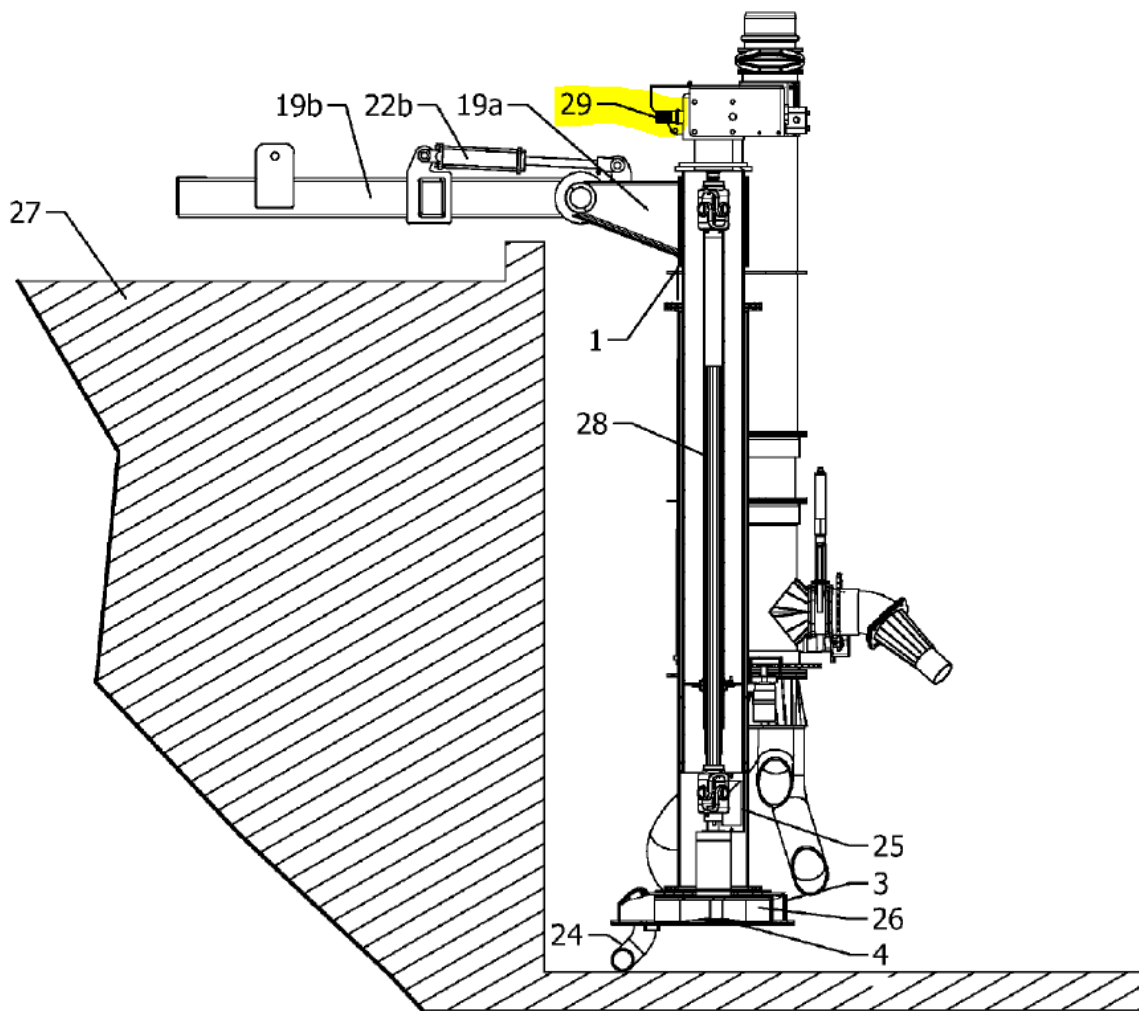


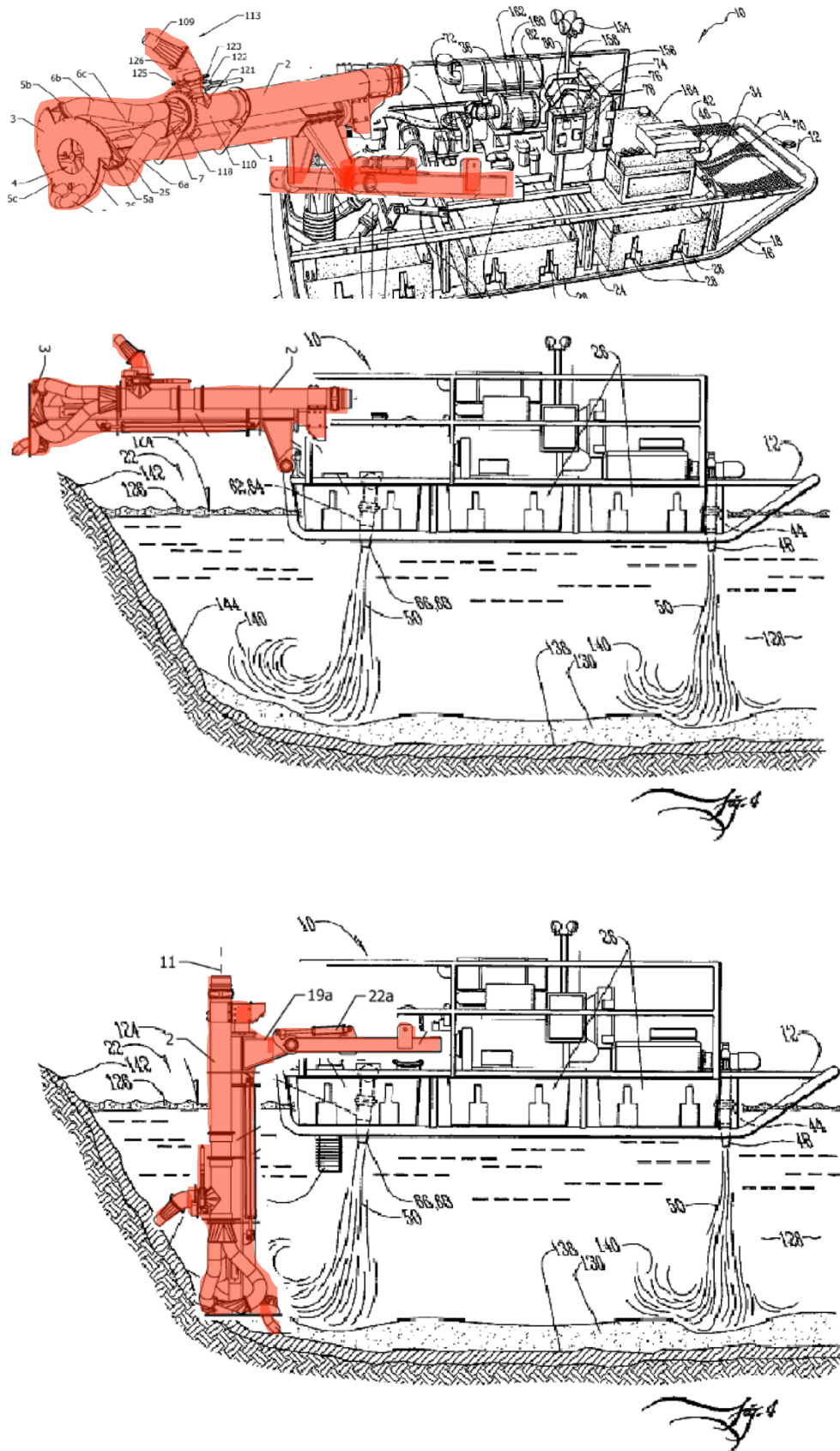
FIG. 2

EX2101, Fig. 2, p. 3.

236. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the boom arm to the rear of Puck's deck in such a way that the boom arm could pivot so the lower end is immersed in the manure and the upper end can mate with a drive shaft to receive power. As will be shown below, what would have been logical to a POSITA is to attach the pivot of arm 19a to the rear crossbar 16, 20 in Puck so that Nuhn's Pit Pump could pivot up and down in a similar manner to the way it operates when attached to the rear hitch of a tractor and so that the PTO connector 29 on the upper end of the

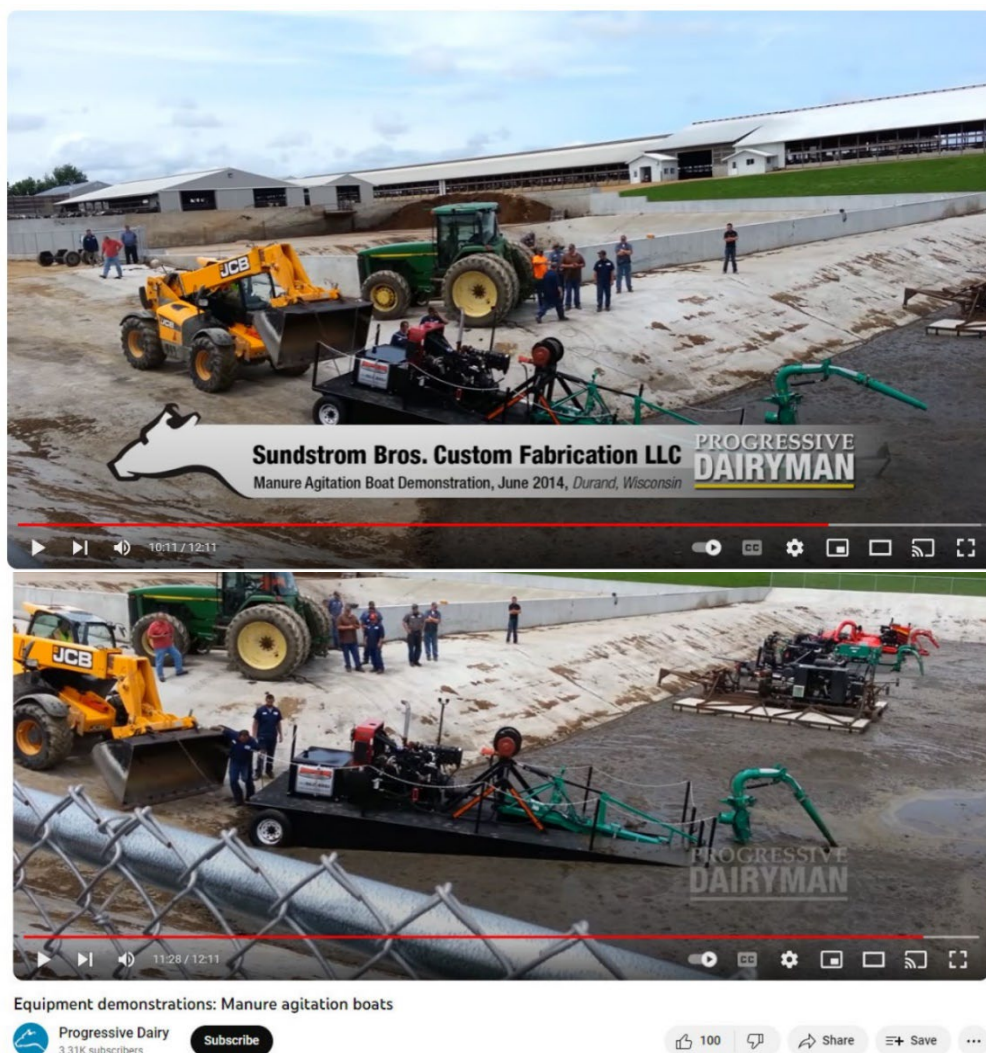
boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Puck's power source.

237. If a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump, then the resulting combination would look like this:



238. My opinion regarding how a POSITA would go about adding Nuhn's Pit Pump to Puck, if they were so motivated, is not based on speculation (like Dr. Winkel's opinion), but rather is based on record evidence. In particular, I note that both Sundstrom (EX1153, EX1154, EX1156) and the Puck Prototype (EX1159) show other POSITAs' attempts at adding boom-mounted pumps to manure agitation boats/barges. In both cases, Sundstrom and Puck retained the boom arm, pivot structure, and pivot functionality of the pumps so that the boom-mounted pump could be tilted down and up into and out of the lagoon.

239. Sundstrom's floating manure agitator included a GEA Houle liquid manure pump mounted on the front end of a long boom arm. The boom arm extends forward at an angle that can be tilted up and down to a limited degree.

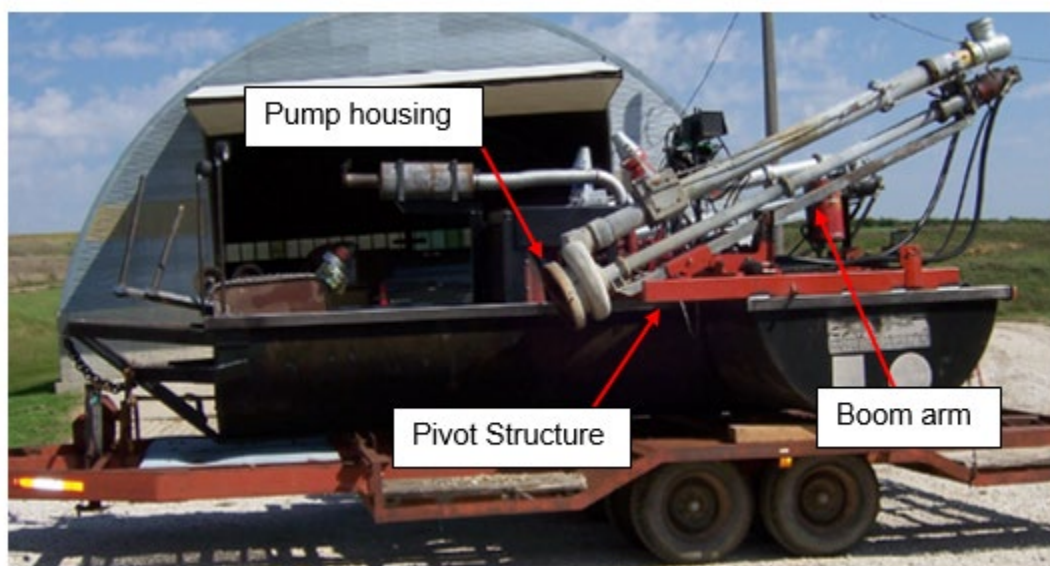


EX2008, 8-9.



EX1156, at 1.

240. The Puck Prototype included two submersible, boom-mounted pumps positioned on the right and left sides of the floating barge:



EX1159, p. 3 (annotated).



EX1159, p. 5.

As shown in the photographs above, the submersible pumps are mounted on the far end of a boom arm that can tilt/swing up and down and be lowered into and out of the manure lagoon.

241. Both Sundstrom and the Puck Prototype reflect what other POSITAs in the art actually did during the same approximate time period (i.e., same decade) as Nuhn's invention. This evidence leads me to the conclusion that a POSITA would have mounted Nuhn's Pit Pump to Puck's boat with little modification, if they were motivated to make such a combination in the first place, and that they would have retained the long 10ft boom arm, pivot structure, and pivot functionality of Nuhn's Pit Pump because that is entirely consistent with what Sundstrom and Puck actually did.

242. On the other hand, this record evidence does not support Petitioner's combination, which does away with the pivot structure and pivot functionality of Nuhn's Pit Pump, and either significantly shortens the boom arm or does away with it completely. None of those modifications were made by Sundstrom or Puck, let alone vertically orienting a submersible manure pump in a constant angular orientation relative the floatable vehicle body.

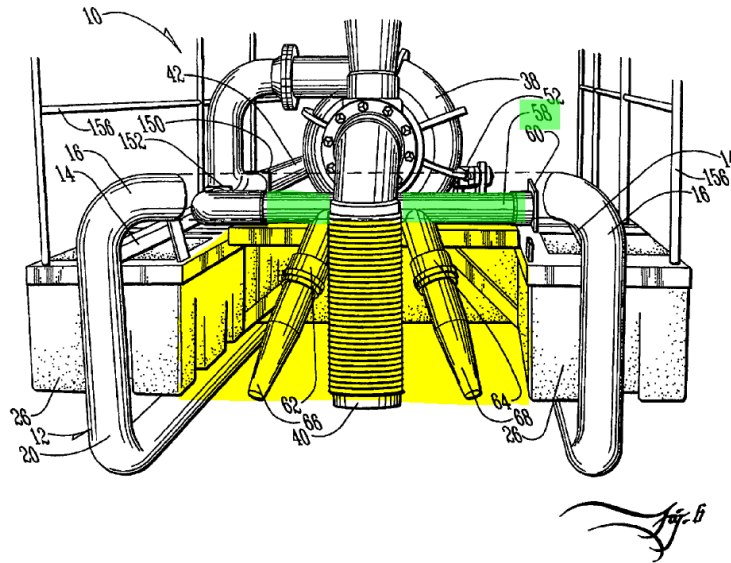
243. In view of the above analysis, if a POSITA were to add Nuhn's Pit Pump to Puck's boat, that combination would result in a pump at the far end of an articulating boom arm so that it could swing up and down in the same manner as when Nuhn's Pit Pump is attached to a tractor. Thus, the combination of Manure-Manager and Puck would not result in a vehicle where the liquid manure pump "has a constant angular orientation relative to the floatable vehicle body" as required by Substitute Claim 57.

3. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST THE CLAIMED POSITION OF THE LIQUID MANURE PUMP, WHERE SUBMERGED PORTIONS OF THE VEHICLE ARE POSITIONED FORWARD OF AND REARWARD OF THE PUMP HOUSING ALONG THE LONGITUDINAL CENTERLINE

244. The Puck Combination fails to teach or suggest the position of the pump housing of the liquid manure pump recited in Substitute Claim 57, which requires a submerged portion of the vehicle to be positioned forward of and rearward of the pump housing along the longitudinal centerline of the floatable vehicle body:

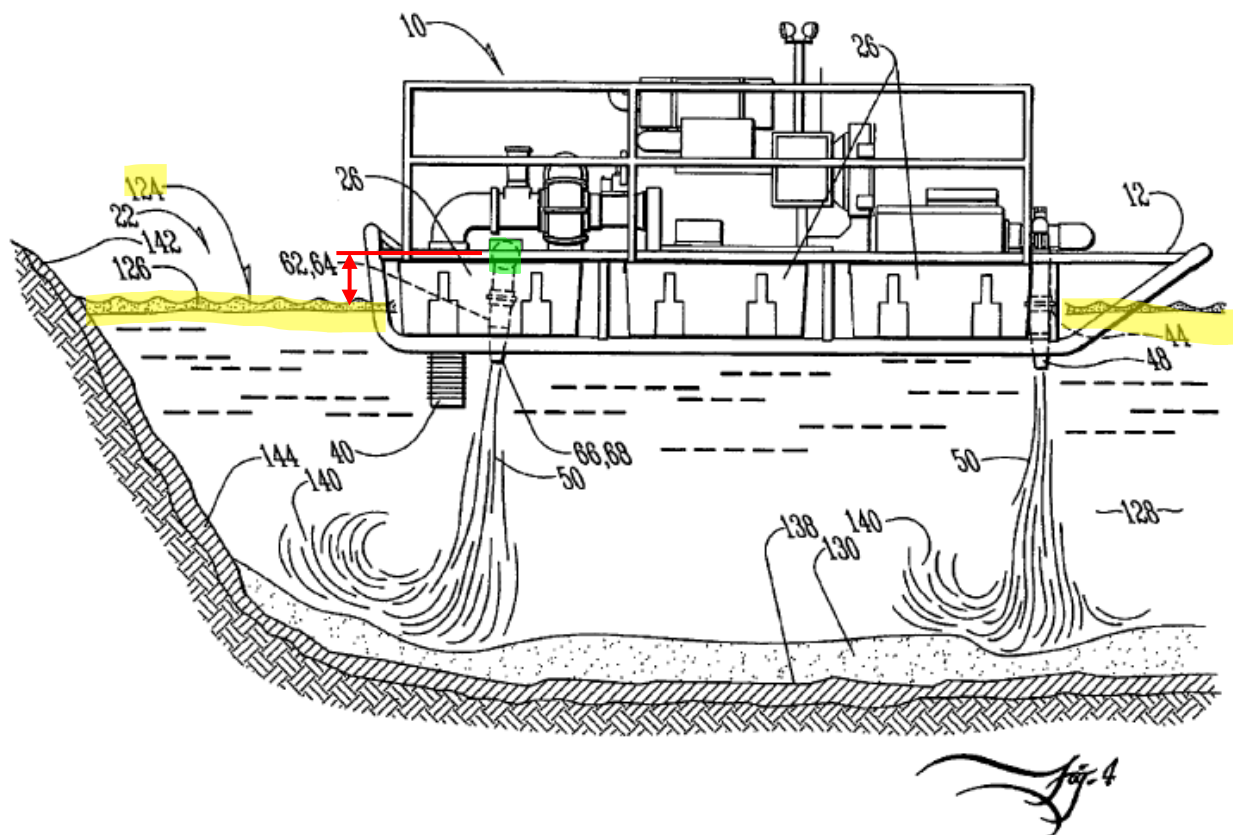
"wherein portions of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to the right and left of the pump housing and are spaced from and positioned forward of and rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump"

245. The rear of Puck's boat has a U-shaped cut-out between the floating dock sections (26) where the liquid manure intake pipe (40) is positioned, with a ninety-degree bend so that the intake pipe extends down into the manure lagoon.



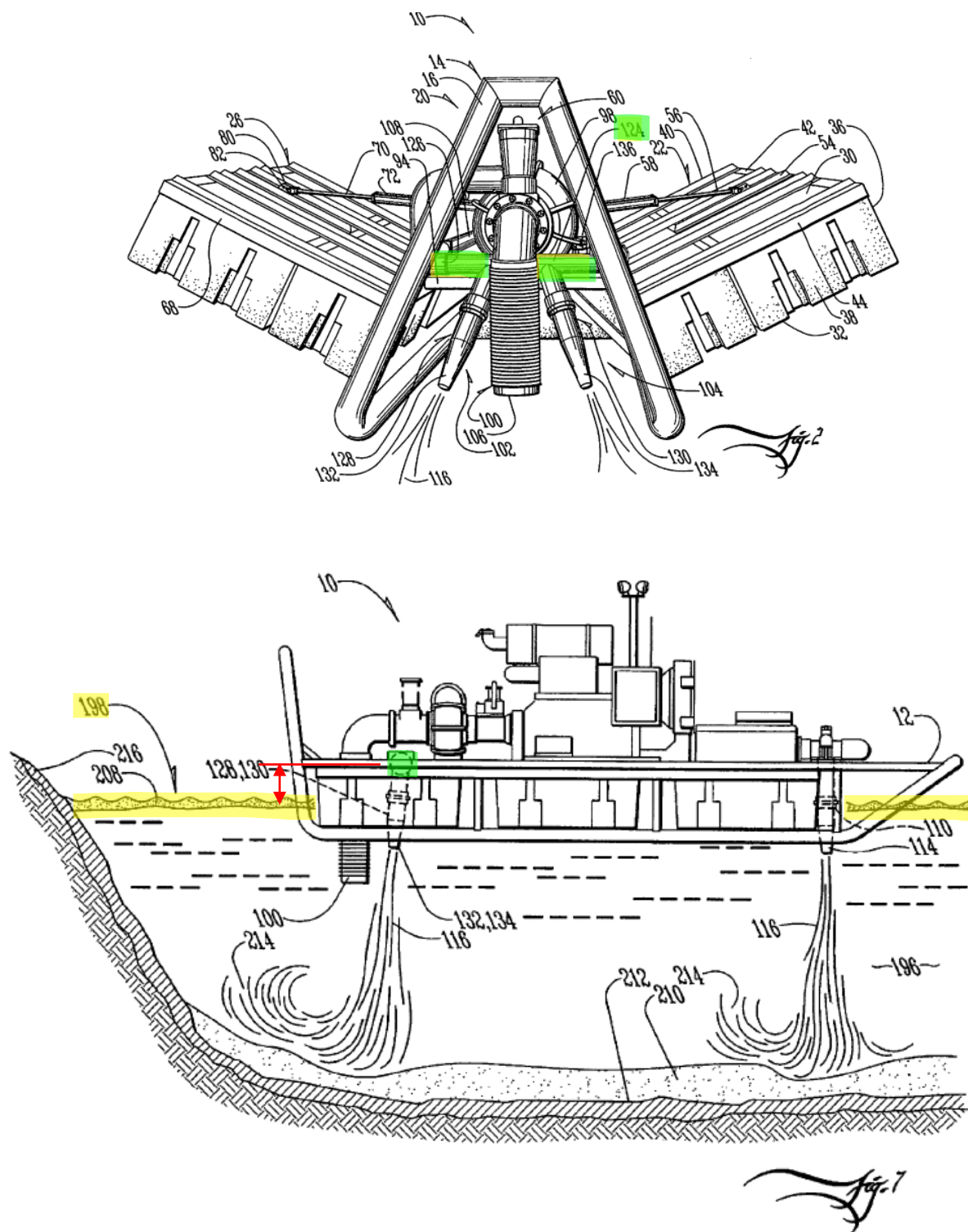
EX1014, Fig. 6, p. 7.

Even if a POSITA positioned Nuhn's Pit Pump in this space, as Petitioner suggests, there would be no submerged portion of the vehicle that is "spaced from and positioned ... rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing", as required by the language of the Substitute Claim 57. This is due to the fact that the rear nozzle yoke 58 disclosed in Puck is **forward** of the intake pipe 40 and is not a submerged component when the vehicle is floating because the rear nozzle yoke 58 is spaced **above** the top of the buoyant elements 26 and therefore is above the surface 124 of the manure lagoon.



EX1014, Fig. 4, p. 5.

246. The Puck Boat is the commercial embodiment of the vehicle described in U.S. Publication No. 2013/0145980 (EX2107, Puck II).

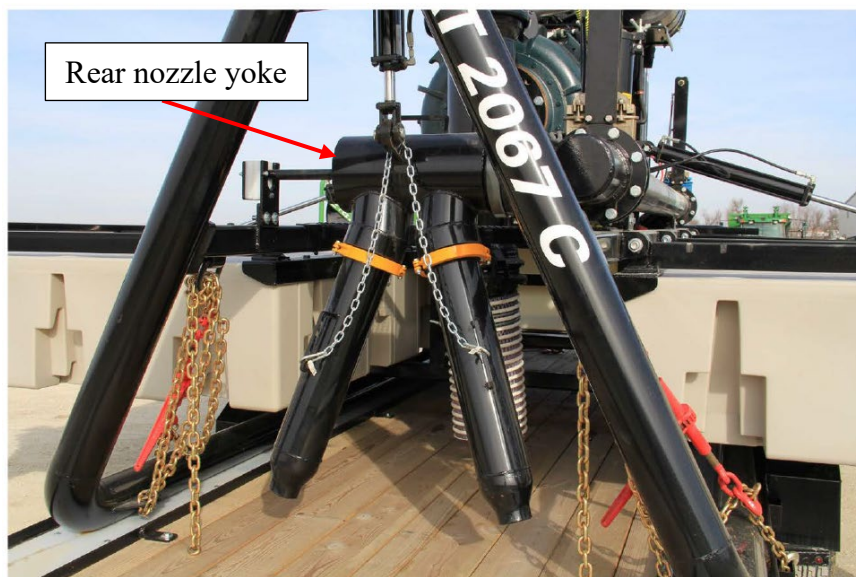


EX2107, Puck II, pp. 3 and 8 , FIGS. 2 and 7.

As shown above, in Puck II, the rear nozzle yolk 124 is also positioned **forward** of the downwardly directed intake pipe 100 and is spaced **above** the top of the buoyant elements 36 and therefore is

above the surface 198 of the manure lagoon.

247. Unlike in Puck II, where the rear nozzle yolk 124 is positioned forward of the downwardly directed intake pipe 100, the rear nozzle yolk on the Puck Boat (i.e., the commercial embodiment) is positioned behind the downwardly directed intake pipe near the rear “A” frame structure.



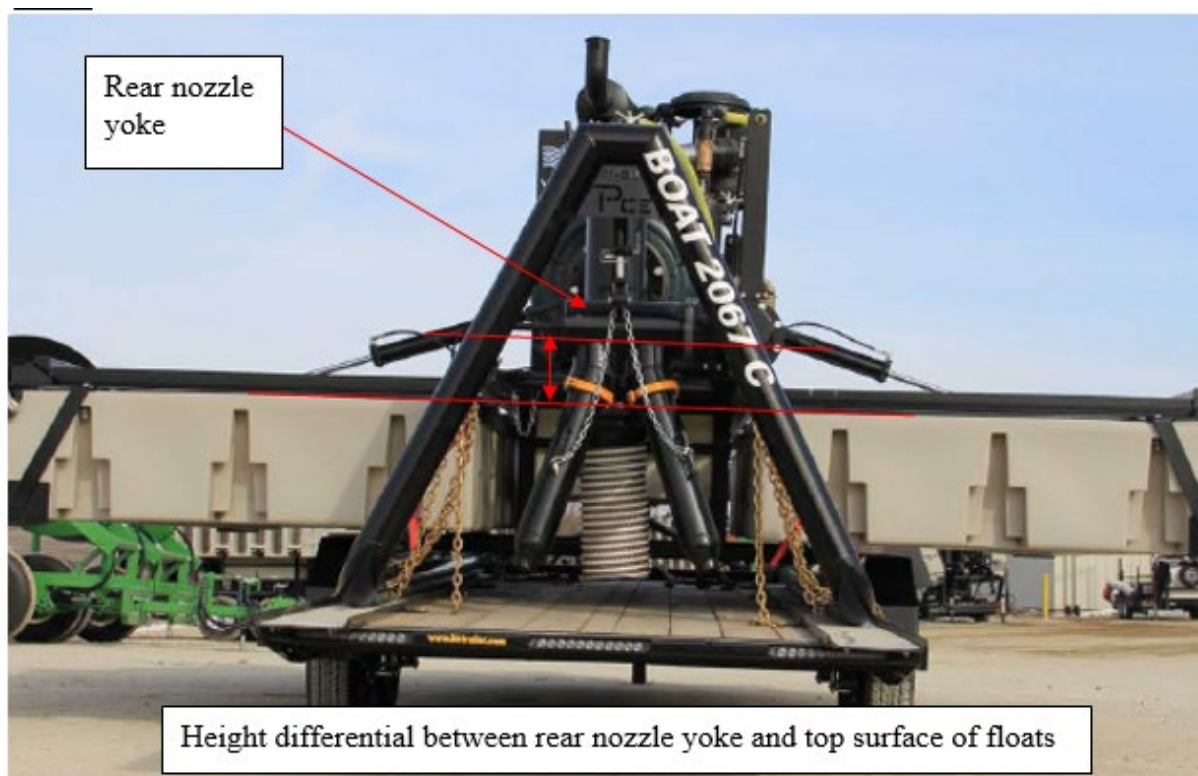
EX1164, p. 41.

248. As discussed above, Nuhn’s Pit Pump is designed to swing up and down, which is a feature that a POSITA would have retained. A POSITA therefore would have positioned the rear nozzle yolk forward of Nuhn’s Pit Pump (like in the configuration disclosed in Puck II) so that the rear nozzle yolk would not interfere with the pivoting pump. In my opinion, a POSITA would not have selected the alternative configuration used on the Puck Boat, where the rear nozzle yolk is rearward of the downwardly directed intake pipe, because a POSITA would have recognized that Nuhn’s Pit Pump would contact the rear nozzles and/or rear nozzle yolk when pivoted upward and to the rear of the boat for storage, transport, launching, and retrieval. This interference would have significantly limited the angle one could tilt Nuhn Pit Pump upward – a problem that would be avoided by selecting the position of the rear nozzle yolk disclosed in Puck II. As a result, a POSITA would have logically followed the teachings of Puck II’s rear nozzle

placement instead of the alternative location for the rear nozzles on Puck's Boat.

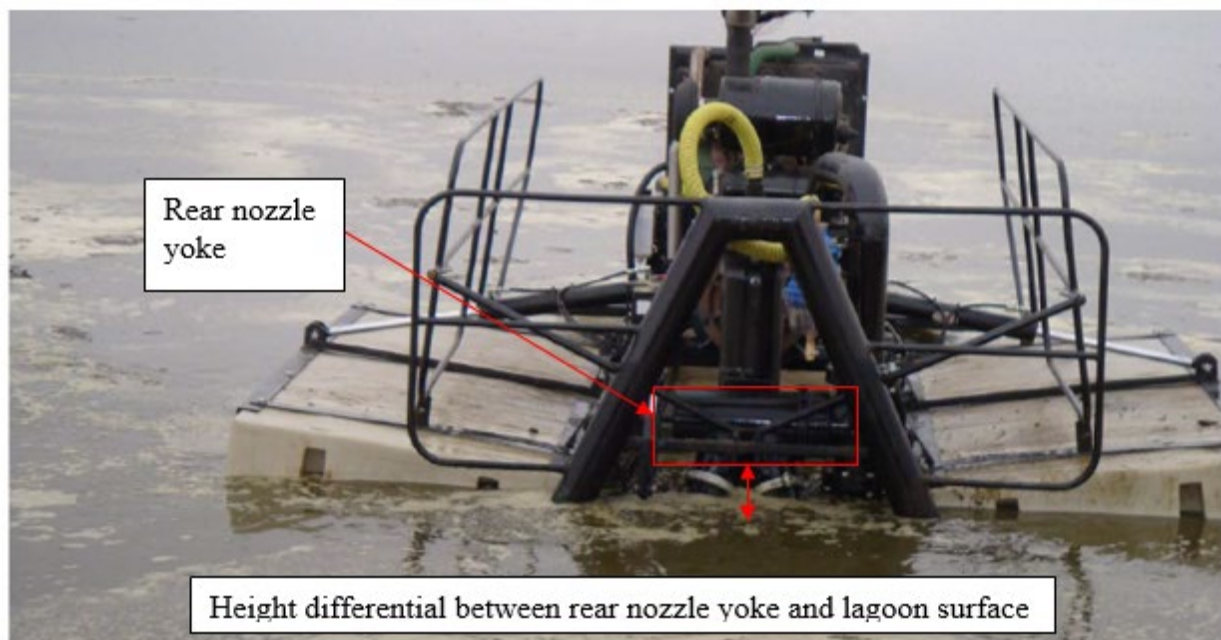
249. But even if a POSITA would have selected the placement of the rear nozzle yoke used on the Puck Boat (i.e., Puck's commercial embodiment), this is not a portion of the vehicle that is submerged as required by the language of Substitute Claim 57.

250. Like in Puck and Puck II, the rear nozzle yoke used on the Puck Boat is spaced above the top of the buoyant elements (i.e., the floats) by several inches.

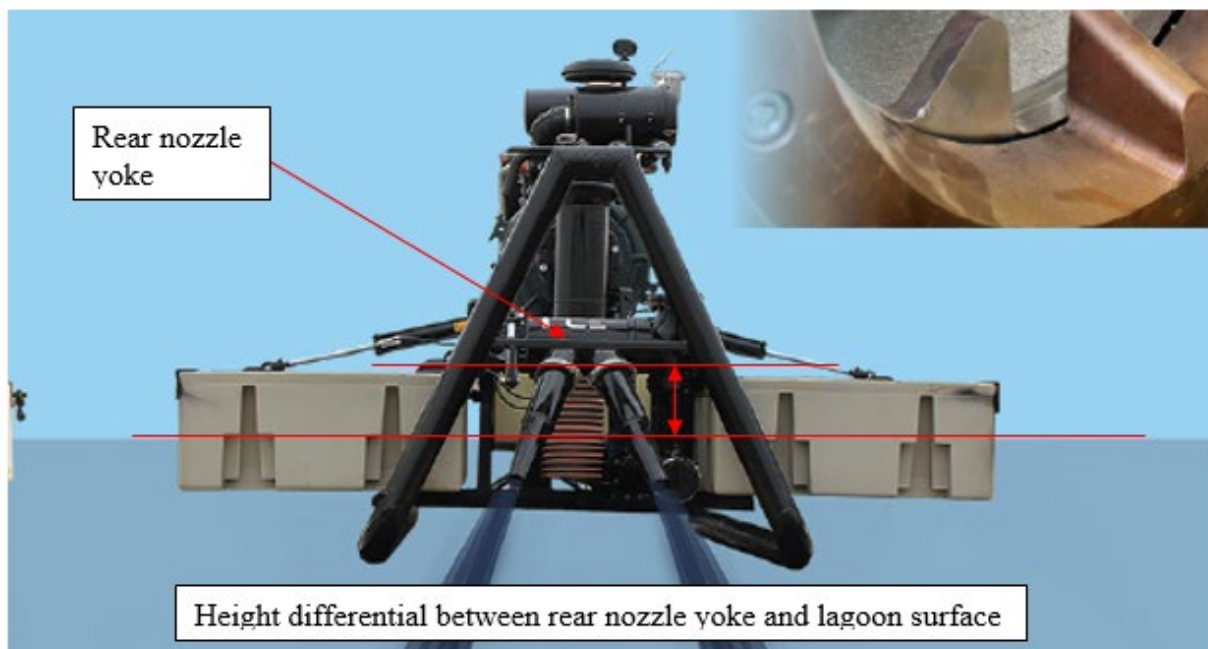


EX1164, p. 18 (annotated).

251. The top of the buoyant elements (floats) are not submersed when the Puck Boat is floating so a POSITA would not understand the rear nozzle yoke to be a portion of the vehicle that is submerged, as required by Substitute Claim 57.



EX1169, p. 2 (annotated).



EX1160, p. 2 (annotated).

252. The photographs above demonstrate that the rear nozzle yoke of the Puck Boat cannot be fairly characterized as a “portion of the vehicle that are submerged when the vehicle is floating”, as Substitute Claim 57 requires.

253. In view of the above analysis, if a POSITA were to add Nuhn's Pit Pump to Puck and adopt the location of the rear nozzle yoke used on the Puck Boat (i.e. the commercial embodiment), the combination would still fall short of the configuration recited in Substitute Claim 57, where "portions of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to the right and left of the pump housing and are spaced from and positioned forward of and rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump" as required by Substitute Claim 57.

254. I also disagree with Dr. Winkel's alternative argument that a POSITA would add a floating dock section (i.e., buoyant element) behind the pump housing of Nuhn's Pit Pump. This argument is entirely hindsight bias, as it is not taught or suggested by any prior art reference or other record evidence.

**4. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST A
"HYDRAULICALLY POWERED LIQUID MANURE MOVER" AND A
"POWER SOURCE CONFIGURED TO PROVIDE POWER TO BOTH THE
GROUND ENGAGING PROPULSION STRUCTURE AND THE LIQUID
MANURE MOVER"**

255. Neither Puck, the Puck Boat, Bryham, or Manure-Manager disclose "a hydraulically powered liquid manure mover" and "a power source that provides power to both the ground engaging propulsion structure and the liquid manure mover" as required by the language of Substitute Claim 57.

256. The manure pumps in Puck and the Puck Boat are mechanically powered as is Nuhn's Pit Pump.

257. With respect to the hydraulic system, Puck discloses a hydraulic pump 54 that is powered by a 12-volt battery 56. EX1014, Para. [0027]. A POSITA would have recognized that such a system would not be capable of powering any manure pump, let alone Nuhn's Pit Pump, which requires a minimum of 95 horsepower. EX2115, p. 2. As a result, a POSITA would have

installed Nuhn's Pit Pump such that its input shaft could be coupled to and mechanically powered by Puck's engine, if they were motivated to make the combination in the first place.

258. Dr. Winkel attempts to correct this by now making the unsupported argument that Bryham's hydraulic system could somehow be used to power both the ground engaging wheels and Nuhn's Pit Pump. EX1174, ¶59. But Dr. Winkel has not shown that a POSITA would expect Bryham's hydraulic system to be capable of powering Nuhn's Pit Pump. The record suggests that it would not.

259. Maurice Bryham testified in his deposition that the optional firefighting pump they used in some of their vehicles was powered by a secondary inboard engine with an effective output of 24 horsepower. EX1176, pp. 111, 117. A POSITA would not reasonably expect Bryham's secondary inboard engine and hydraulic system to be capable of powering Nuhn's Pit Pump when Bryham's system had an output of about 24 horsepower and Nuhn's Pit Pump had a minimum of 95 horsepower.

260. In view of the above analysis, if a POSITA were to add Nuhn's Pit Pump to Puck, they would have mechanically driven Nuhn's Pit Pump by coupling the input drive shaft on Nuhn's Pit Pump to the output shaft of Puck's motor. Thus, the result of this combination would not have been a hydraulically powered liquid manure mover where "a power source that provides power to both the ground engaging propulsion structure and the liquid manure mover" as required by the language of Substitute Claim 57.

5. THE PUCK COMBINATION FAILS TO DISCLOSE "WIRELESS REMOTE CONTROL CONFIGURED TO ... (1) CONTROL THE GROUND ENGAGING PROPULSION STRUCTURE"

261. Puck's remote-control system is limited to turning the engine on and off, controlling engine speed, turning the nozzles on and off, and controlling nozzle direction. *See* EX1014, Puck, ¶¶ [0032]-[0033]. Puck also lacks any sort of ground engaging propulsion structure. As a result, Puck's remote-control system does not provide "wireless remote control configured to enable an

operator who is remote from the vehicle to ... (1) control the ground engaging propulsion structure” as required by the language of Claim 41. And Bryham lacks any discussion of remote control and therefore fails to supply this element missing from Puck.

262. Dr. Winkel argues that a POSITA would have been motivated to configure the remote-control steering system of Puck (used while the boat of Puck is floating) to control the speed and direction of Bryham’s wheels while the vehicle is ground engaging. EX1004, Winkel Decl., ¶¶349-350. But this argument fails to address whether a POSITA would have a reasonable expectation that Puck’s remote-control system for controlling movement while floating in the manure lagoon could be successfully modified and used for control over Bryham’s steering and propulsion system (i.e., Bryham’s wheels) while Puck’s boat is on the ground. Again, POSITA would understand that just because *some* vehicles can be remote controlled does not mean that *all* vehicles can be remote controlled.

R. Claim 58

263. Claim 58 depends from Claim 57 and recites: “The vehicle according to claim 57, wherein the ground engaging propulsion structure comprises a set of ground engaging wheels or endless tracks.” As described above, the Puck Combination does not render Claim 57 obvious. Claim 58 is not obvious at least because of its dependence on Claim 57.

S. Claim 59

264. Claim 59 depends from Claim 57 and recites: “The vehicle according to claim 57, wherein the power source is configured to provide hydraulic fluid power to both the ground engaging propulsion structure and the liquid manure mover.” As described above, the Puck Combination does not render Claims 57 obvious. Claim 59 is not obvious at least because of its dependence on Claim 57.

T. Claim 60

265. Claim 60 depends from Claim 59 and recites: “The vehicle according to claim 59,

wherein the ground engaging propulsion structure is operable at variable speed by the hydraulic motor.” As described above, the Puck Combination does not render Claims 57 and 59 obvious. Claim 60 is not obvious at least because of its dependence on Claims 57 and 59.

U. Claim 61

266. Claim 61 depends from Claim 57 and recites: “The vehicle according to claim 57, wherein the vehicle comprises at least one fluid nozzle that is fluidly-connected to the at least one fluid conduit.” As described above, the Puck Combination does not render Claim 57 obvious. Claim 61 is not obvious at least because of its dependence on Claim 57.

V. Claim 62

267. Claim 62 depends from Claim 61 and recites: “The vehicle according to claim 61, wherein the at least one fluid nozzle comprises a plurality of fluid nozzles that are fluidly-connected to the at least one fluid conduit.” As described above, the Puck Combination does not render Claims 57 and 61 obvious. Claim 62 is not obvious at least because of its dependence on Claims 57 and 61.

W. Claim 63

268. Claim 63 depends from Claim 61 and recites: “The vehicle according to claim 61, wherein the amount of fluid flow from the at least one fluid nozzle and/or the direction of the at least one fluid nozzle are remotely controllable by the operator remote from the vehicle when the vehicle is floating.” As described above, the Puck Combination does not render Claims 57 and 61 obvious. Claim 63 is not obvious at least because of its dependence on Claims 57 and 61.

X. Claim 64

269. Claim 64 depends from Claim 57 and recites: “The vehicle according to claim 57, wherein the location of the ground engaging propulsion structure, the power source, and the immersible liquid manure pump are selected to provide a desired location for a center of gravity

of the vehicle.” As described above, the Puck Combination does not render Claim 57 obvious. Claim 64 is not obvious at least because of its dependence on Claim 57.

Y. Claim 65

270. Claim 65 depends from Claim 57 and recites: “The vehicle according to claim 57, further comprising an angle adjustment structure configured to adjust an angular orientation of the at least one fluid nozzle of the liquid manure mover.” As described above, the Puck Combination does not render Claim 57 obvious. Claim 65 is not obvious at least because of its dependence on Claim 57.

Z. Claim 66

271. Claim 66 depends from Claim 65 and recites: “The vehicle according to claim 65, wherein the angle adjustment structure comprises a hydraulically powered articulation means.” As described above, the Puck Combination does not render Claims 57 and 65 obvious. Claim 66 is not obvious at least because of its dependence on Claims 57 and 65.

AA. Claim 67

272. Claim 67 depends from Claim 66 and recites: “The vehicle according to claim 66, wherein the hydraulically powered articulation means comprises a hydraulic cylinder.” As described above, the Puck Combination does not render Claims 57, 65, and 66 obvious. Claim 67 is not obvious at least because of its dependence on Claims 57, 65, and 66.

BB. Claim 68

273. Claim 68 depends from Claim 66 and recites: “The vehicle according to claim 66, wherein the angle adjustment structure comprises a four bar linkage connected to the hydraulically powered articulation means to extend the effective stroke length of the hydraulically powered articulation means.” As described above, the Puck Combination does not render Claims 57, 65, and 66 obvious. Claim 68 is not obvious at least because of its dependence on Claims 57, 65, and

66.

CC. Claim 69

274. Claim 69 depends from Claim 65 and recites: “The vehicle according to claim 65, wherein the angle adjustment structure adjusts the angular orientation of the at least one fluid nozzle of the liquid manure mover in a vertical plane.” As described above, the Puck Combination does not render Claims 57 and 65 obvious. Claim 69 is not obvious at least because of its dependence on Claims 57 and 65.

DD. Claim 70

275. Claim 70 depends from Claim 66 and recites: “The vehicle according to claim 66, wherein the angle adjustment structure adjusts the angular orientation of the at least one fluid nozzle of the liquid manure mover in a vertical plane.” As described above, the Puck Combination does not render Claims 57, 65, and 66 obvious. Claim 70 is not obvious at least because of its dependence on Claims 57, 65, and 66.

EE. Claim 71

276. Claim 71 depends from Claim 65 and recites: “The vehicle according to claim 65, wherein the angle adjustment structure adjusts the angular orientation of the at least one fluid nozzle of the liquid manure mover in a horizontal plane.” As described above, the Puck Combination does not render Claims 57 and 65 obvious. Claim 71 is not obvious at least because of its dependence on Claims 57 and 65.

FF. Claim 72

277. Claim 72 depends from Claim 66 and recites: “The vehicle according to claim 66, wherein the angle adjustment structure adjusts the angular orientation of the at least one fluid nozzle of the liquid manure mover in a horizontal plane.” As described above, the Puck Combination does not render Claims 57, 65, and 66 obvious. Claim 72 is not obvious at least

because of its dependence on Claims 57, 65, and 66.

GG. Claim 73

278. Claim 73 depends from Claim 41 and recites: “The vehicle according to claim 41, wherein the plurality of ground engaging elements is powered by a separate hydraulic motor for each ground engaging element.” As described above, the Puck Combination does not render Claim 41 obvious. Claim 73 is not obvious at least because of its dependence on Claim 41.

HH. Claim 74

279. Claim 74 depends from Claim 41 and recites: “The vehicle according to claim 41, wherein at least one hydraulic motor that is operable at variable speed is connected to each ground engaging element.” As described above, the Puck Combination does not render Claim 41 obvious. Claim 74 is not obvious at least because of its dependence on Claim 41.

II. Claim 75

280. Claim 75 depends from Claim 42 and recites: “The vehicle according to claim 42, wherein the ground engaging propulsion structure is the set of ground engaging wheels and wherein each ground engaging wheel is powered by its own variable speed hydraulic motor.” As described above, the Puck Combination does not render Claims 41 and 42 obvious. Claim 75 is not obvious at least because of its dependence on Claims 41 and 42.

JJ. Claim 76

281. Claim 76 depends from Claim 57 and recites: “The vehicle according to claim 57, wherein the plurality of ground engaging elements is powered by a separate hydraulic motor for each ground engaging element.” As described above, the Puck Combination does not render Claim 57 obvious. Claim 76 is not obvious at least because of its dependence on Claim 57.

KK. Claim 77

282. Claim 77 depends from Claim 57 and recites: “The vehicle according to claim 57,

wherein at least one hydraulic motor that is operable at variable speed is connected to each ground engaging element.” As described above, the Puck Combination does not render Claim 57 obvious. Claim 77 is not obvious at least because of its dependence on Claim 57.

LL. Claim 78

283. Claim 78 depends from Claim 58 and recites: “The vehicle according to claim 58, wherein the ground engaging propulsion structure is the set of ground engaging wheels and wherein each ground engaging wheel is powered by its own variable speed hydraulic motor.” As described above, the Puck Combination does not render Claims 57 and 58 obvious. Claim 78 is not obvious at least because of its dependence on Claims 57 and 58.

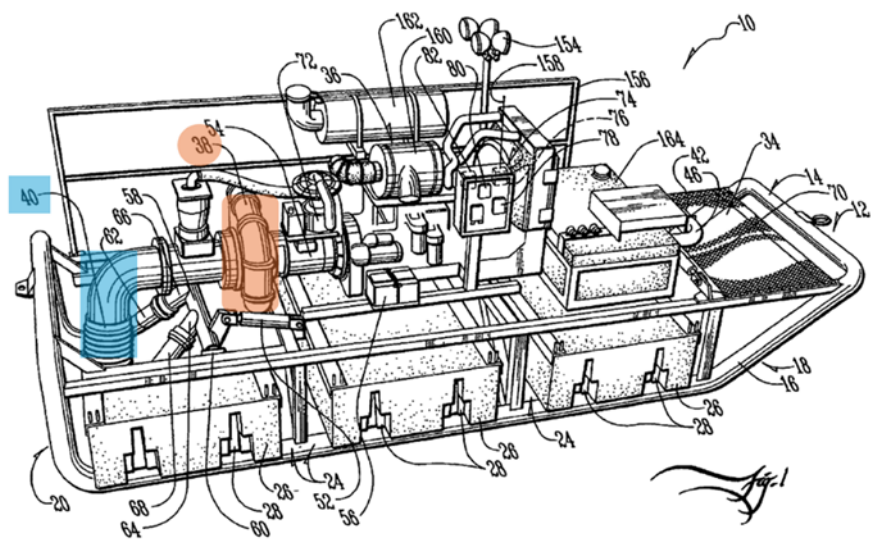
MM. Claim 79

1. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST THE CLAIMED POSITION OF THE LIQUID MANURE PUMP, WHERE THE PUMP HOUSING IS MOUNTED TO THE UNDERSIDE OF THE FLOATABLE VEHICLE BODY

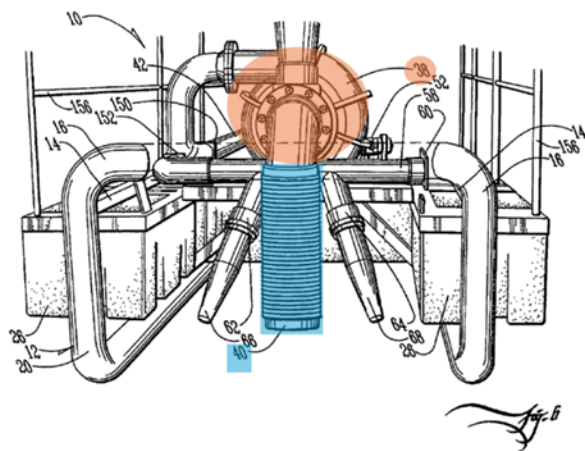
284. The Puck Combination fails to teach or suggest the arrangement where the pump housing of the liquid manure pump is mounted to the underside of the floatable vehicle body as recited in Substitute Claim 79:

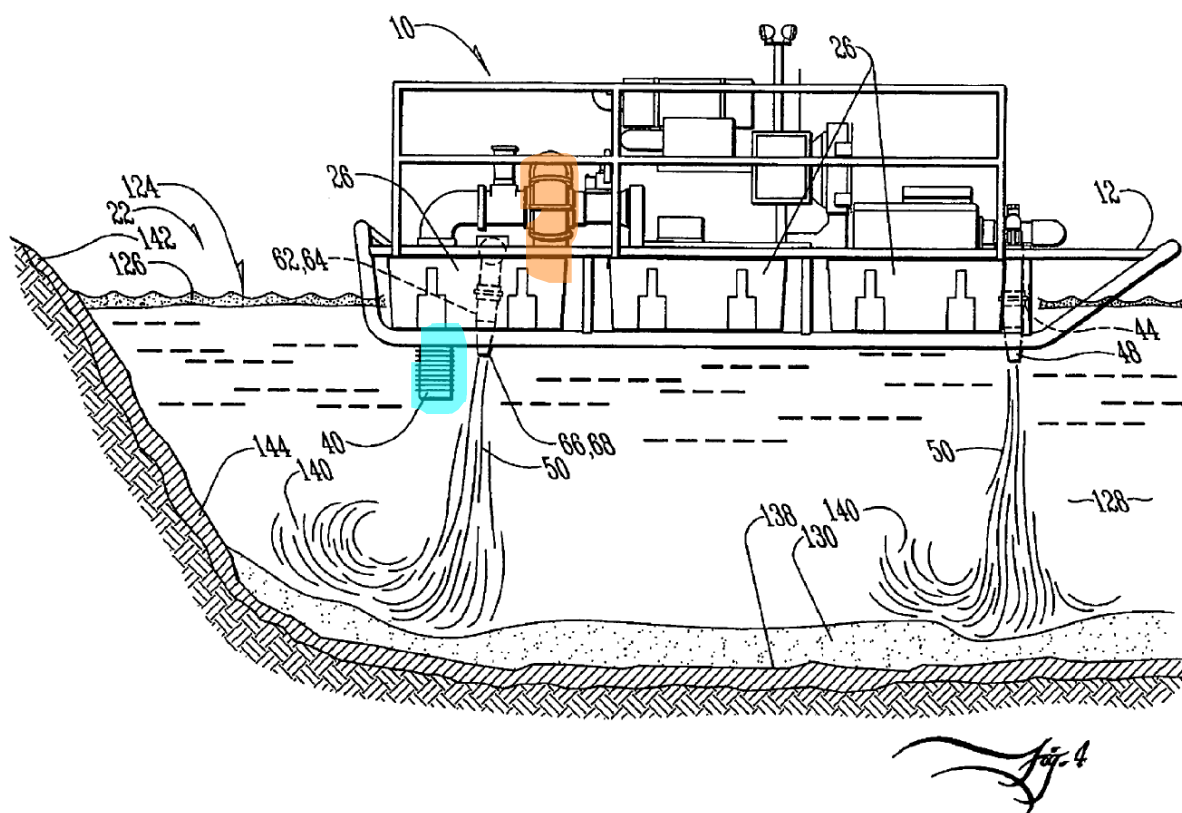
“the pump housing is mounted to the underside of the floatable vehicle body in a space collectively defined between the four ground engaging wheels such that the pump housing is rearward of the front of the floatable vehicle body and forward of the rear of the floatable vehicle body”

285. Puck discloses a manure agitation boat including a slurry pump (38) that is mounted to the top deck, above the floating dock sections (26):



EX1014 at 2 (annotated).





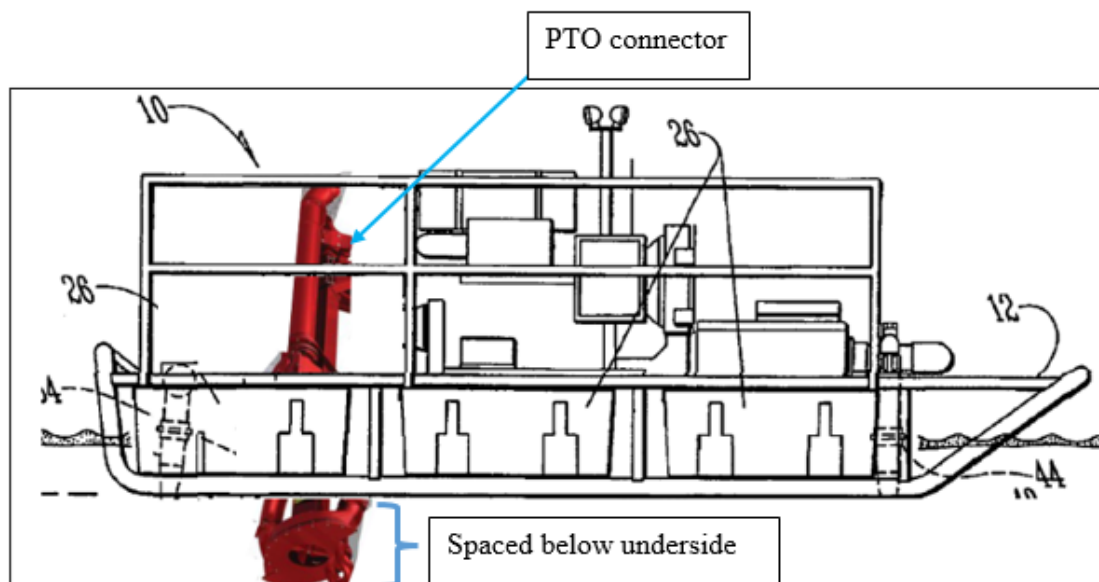
EX1014 at 5, 7 (annotated).

286. The pump housing (in orange) is not mounted to the underside of the boat.

287. A POSITA looking to the teachings of Puck when attempting to design a new manure lagoon agitation vehicle would logically follow its disclosure, which teaches mounted a non-submersible pump to the top deck of the floatable vehicle body where it is high and dry. Puck does not teach or suggest the claimed arrangements where the housing of the liquid manure pump is mounted to the underside of the floatable vehicle body.

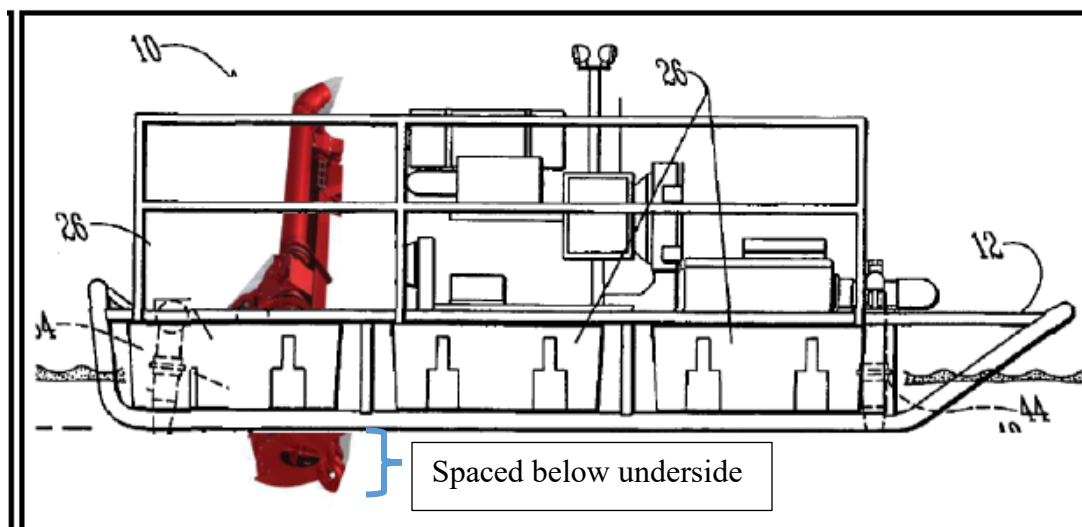
288. I disagree with Dr. Winkel's combination of Manure-Manager with Puck, as shown below, because Dr. Winkel advocates mounting Nuhn's Pit Pump in a location that would be

illogical to a POSITA based on the teachings of Manure-Manager and Puck.



EX1109 in IPR2023-01161, ¶143.

Dr. Winkel attempts to correct this in the present IPR, by moving the pump even higher, but these modifications are illogical absent hindsight bias and are contrary to other record evidence (e.g., EX1156 and EX1159) showing how a POSITA would have added Nuhn's Pit Pump to Puck around the time of the invention, if they were motivated to do so.



EX1174, ¶44.

289. Manure-Manager teaches a POSITA to locate a submersible manure pump at the lower end of a boom arm. The upper end of the boom arm opposite the manure pump is configured to be attached to the three-point mount on a tractor and the manure pump is powered/driven by the power-take-off (PTO) of the tractor, which couples to a driveshaft located at the upper end of the boom arm:



EX1088, p. 27.

290. Fig. 2 of Nuhn's '758 Patent clearly depicts the PTO connector 29 at the upper end of the boom arm 1 where the driveshaft couples the PTO of the tractor to the gearbox of Nuhn's Pit Pump:

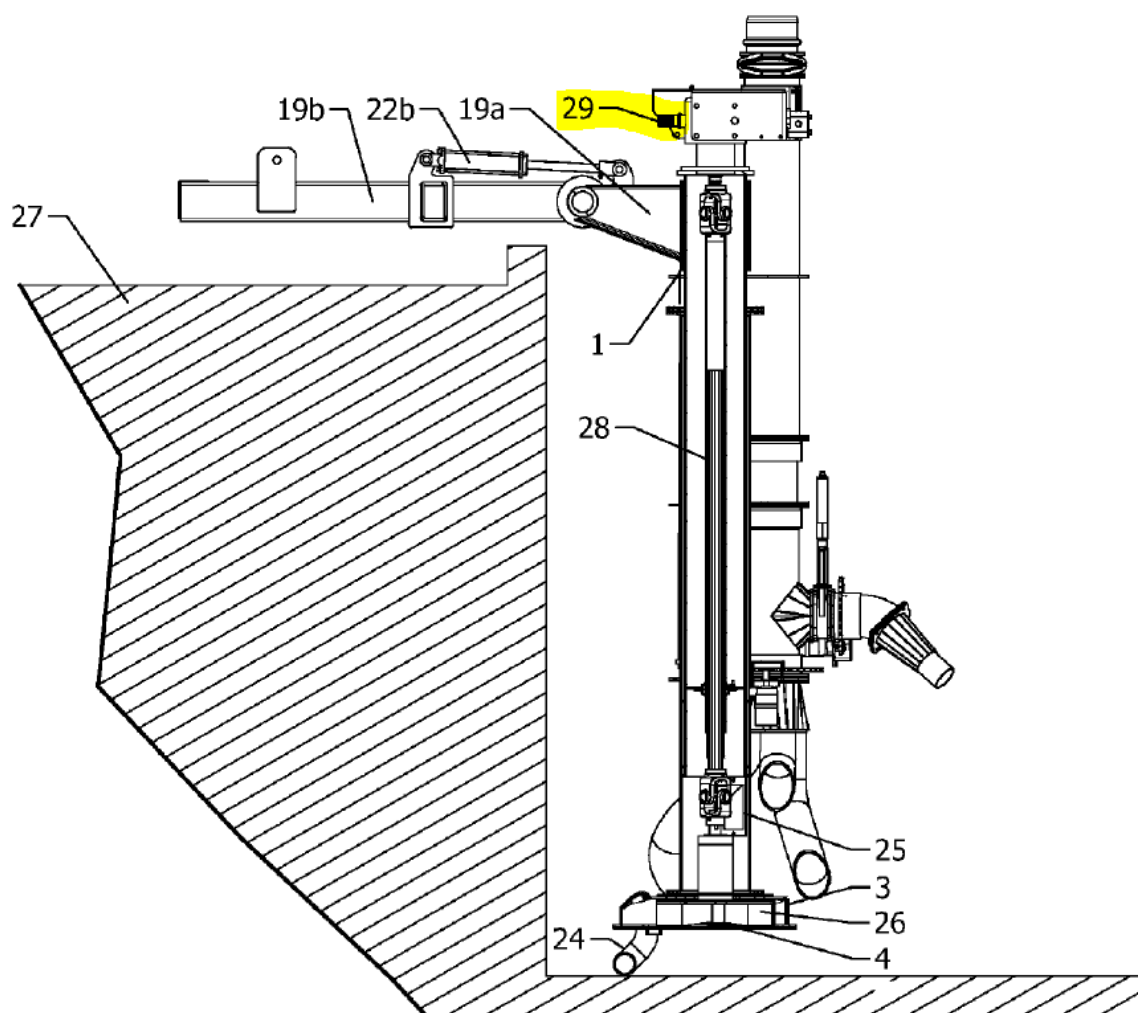
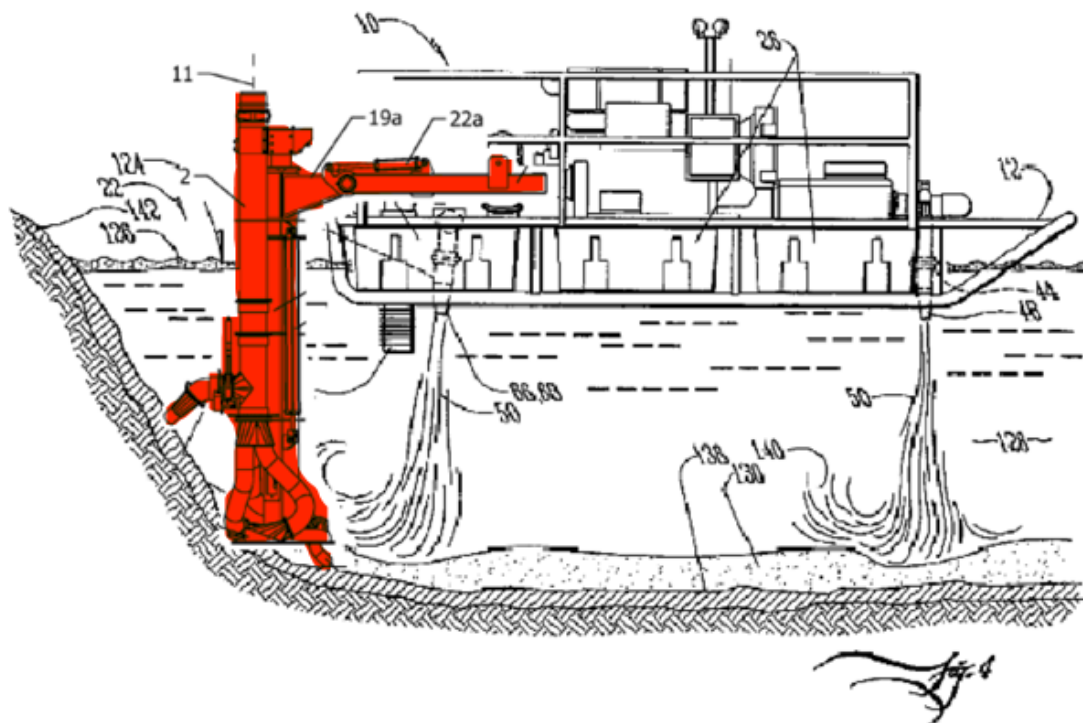


FIG. 2

EX2101, Fig. 2.

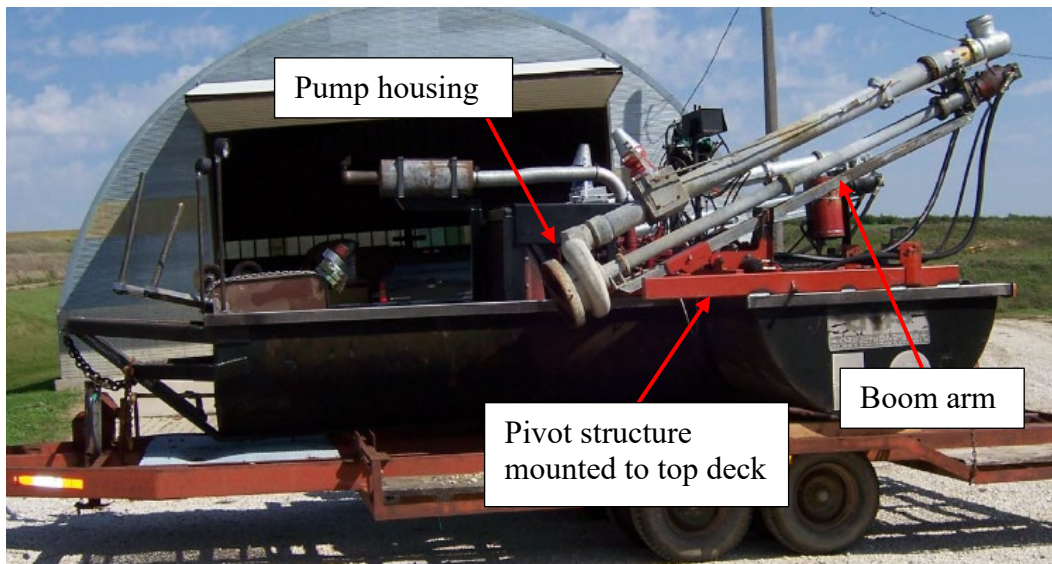
291. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the pivot of arm 19a to the rear of Puck's deck so that the PTO connector 29 on the upper end of the boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Puck's power source.

292. If a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump, then the resulting combination would look like this:



293. Petitioner glosses over the language in Claim 79 requiring the pump housing to be **mounted to** the underside of the floatable vehicle body – as opposed to simply being “positioned along the underside” like in Claims 41 and 57 – and ignores record evidence showing that both Puck and Sunstrom installed boom mounted pumps to the top deck – not to the underside.

294. Puck's prototype and Sundstrom both demonstrate that if a POSITA were motivated to add Nuhn's Pit Pump to Puck's boat, they would have retained the boom and pivot structure of Nuhn's Pit Pump and would have mounted the pivot structure to the top deck of Puck's boat.



EX1159, p. 3.



EX1156, at 1.

295. In view of the above analysis, the Puck Combination would not result in a vehicle where “the pump housing is mounted to the underside of the floatable vehicle body” as required by Substitute Claim 79.

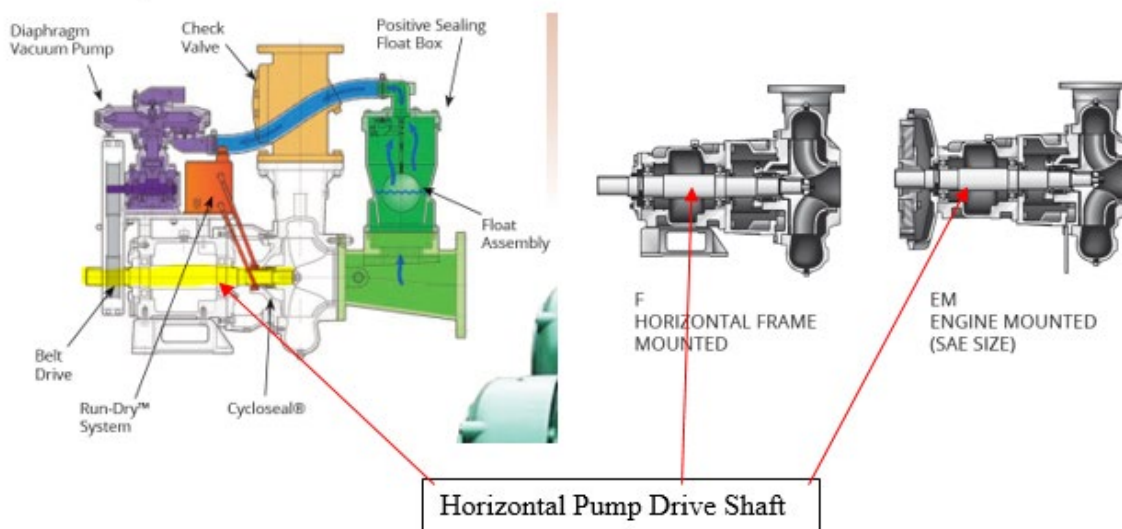
2. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST A LIQUID MANURE PUMP HAVING A VERTICAL DRIVESHAFT AND A CONSTANT ANGULAR ORIENTATION

296. The Puck Combination fails to teach or suggest the fixed orientation of the liquid manure pump recited in Substitute Claim 79, which requires the liquid manure pump to have a substantially vertical driveshaft powering an impeller and a constant angular orientation:

“the immersible liquid manure pump of the liquid manure mover including a pump housing and an impeller that is driven by a substantially vertical drive shaft”

“such that immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating and has a constant angular orientation relative to the floatable vehicle body”

297. As discussed above, Puck discloses an agitation boat including a slurry pump (38) that is illustrated on top of the boat hull at a location that is high above the surface of a manure lagoon. The slurry pump (38) in Puck is mechanically powered by a horizontal drive shaft and has a rear-facing fluid opening in the back of the pump housing.



EX1143 at 2, 7.

298. Puck does not teach or suggest the claimed arrangements where the liquid manure pump has a substantially vertical drive shaft.

299. Manure-Manager teaches a POSITA to locate a submersible manure pump at the lower end of an articulating boom arm that swings / pivots up and down:

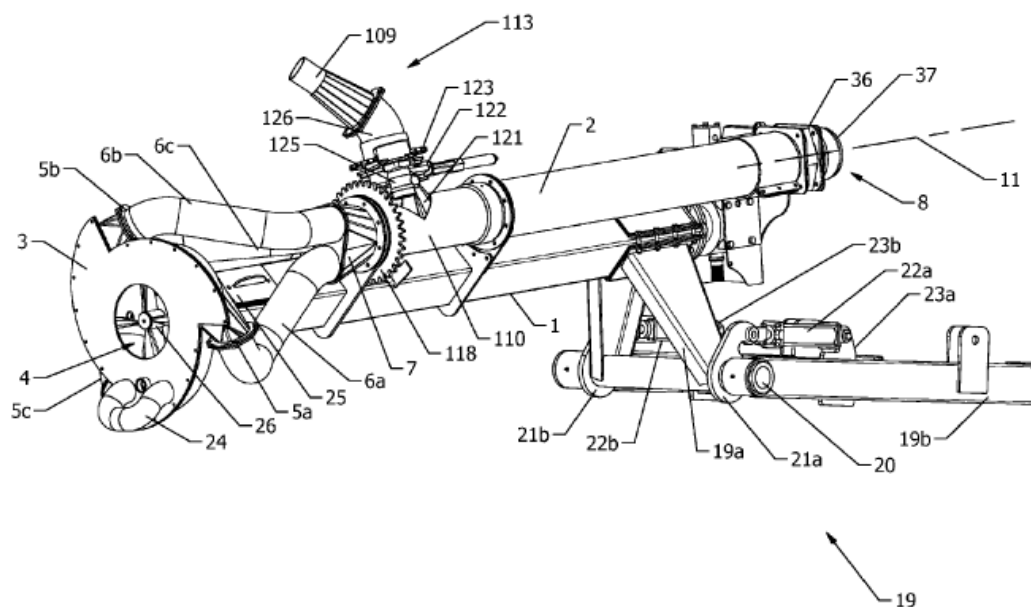


FIG. 1

EX2101, Fig. 1, p. 2.

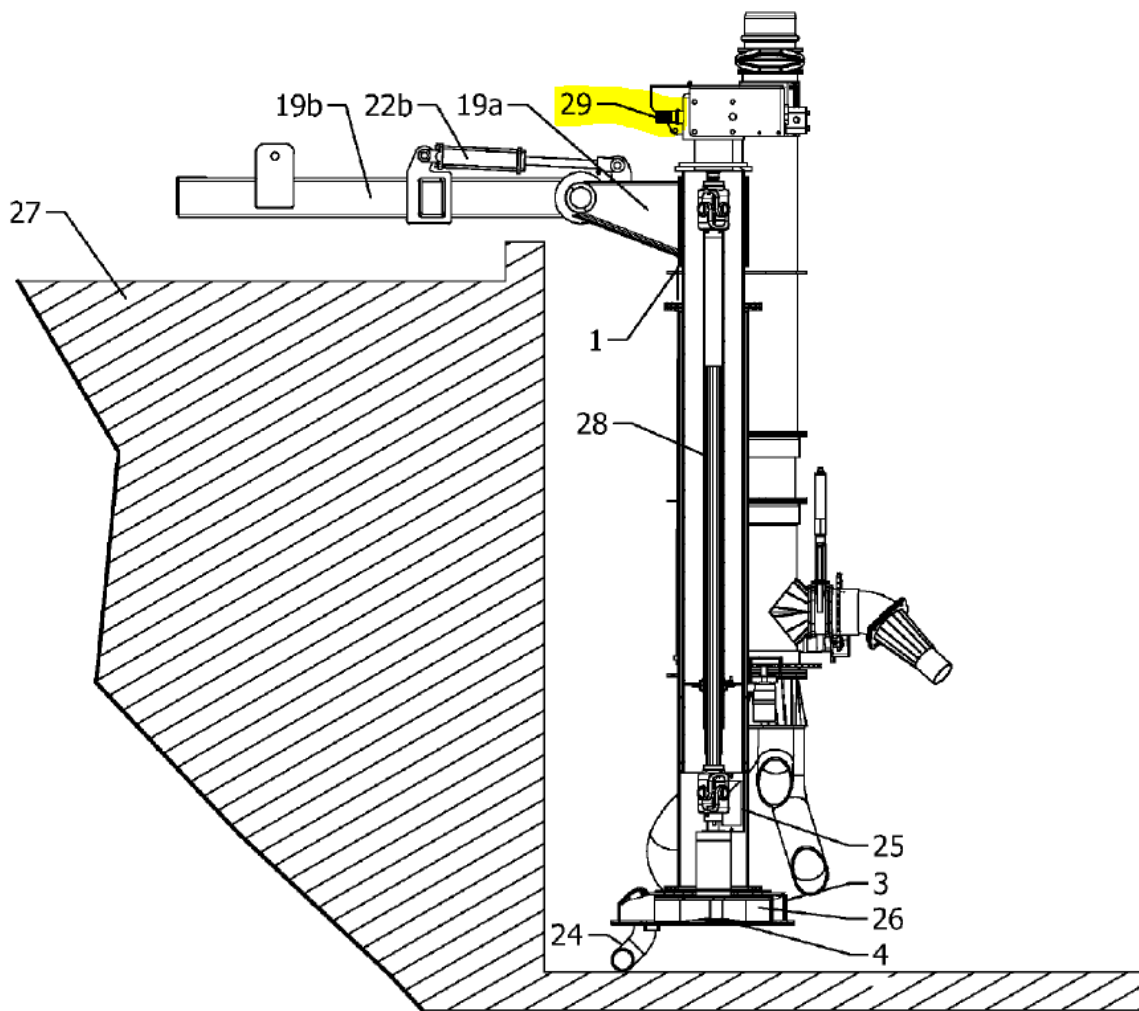


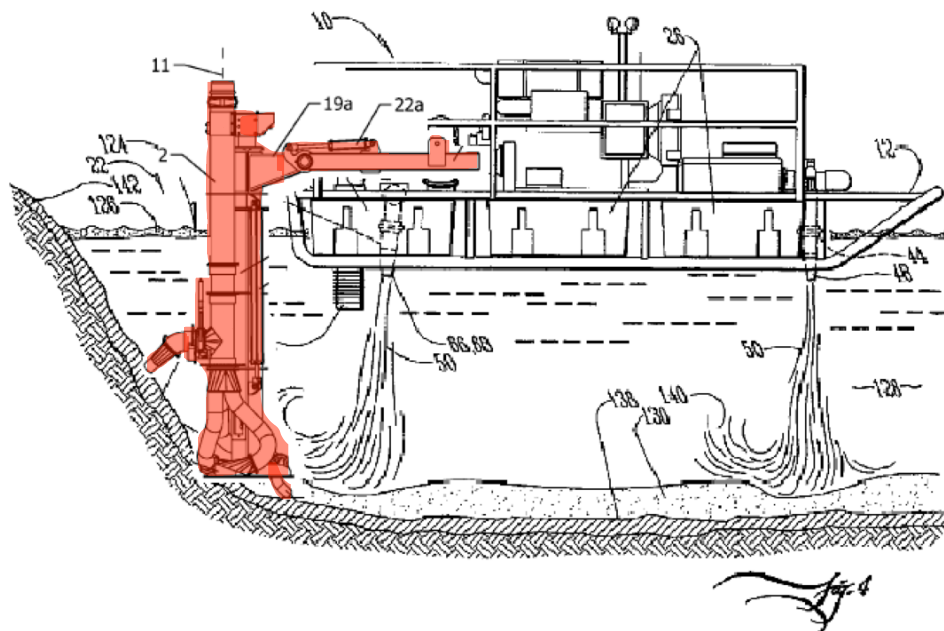
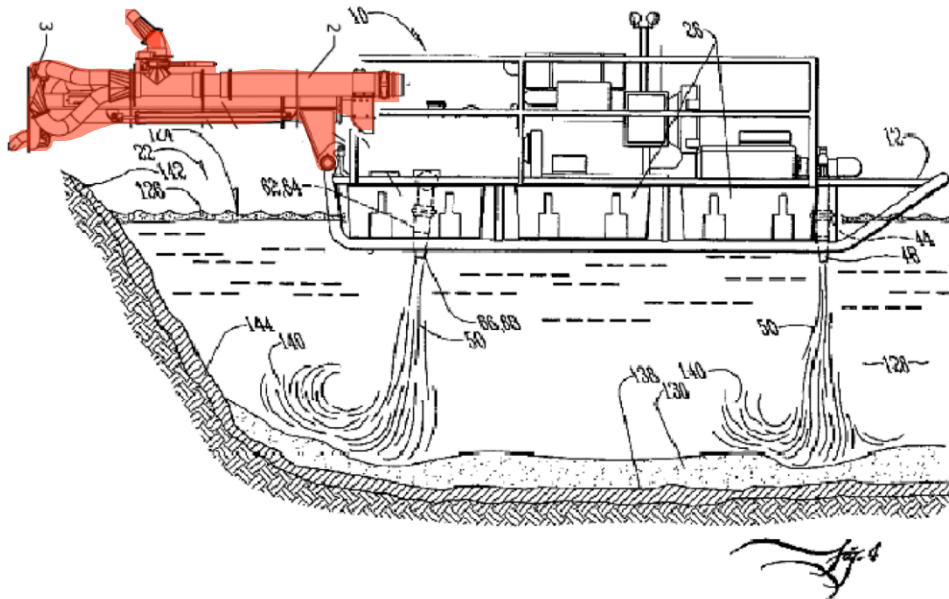
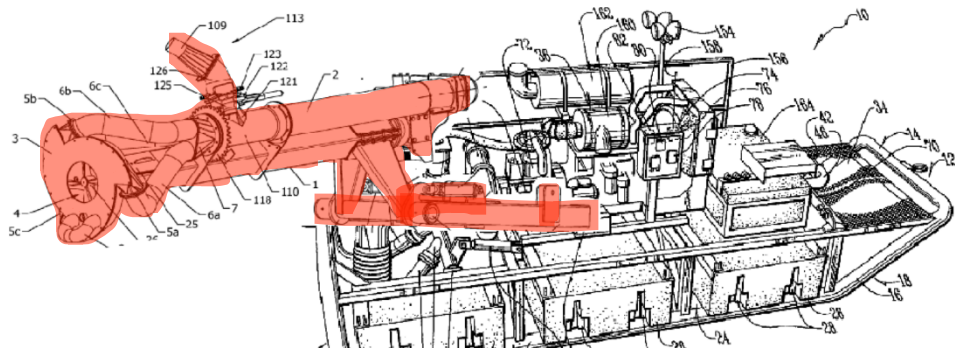
FIG. 2

EX2101, Fig. 2, p. 3.

300. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the boom arm to the rear of Puck's deck in such a way that the boom arm could pivot so the lower end is immersed in the manure and the upper end can mate with a drive shaft to receive power. As will be shown below, what would have been logical to a POSITA is to attach the pivot of arm 19a to the rear crossbar 16, 20 in Puck so that Nuhn's Pit Pump could pivot up and down in a similar manner to the way it operates when attached to the rear hitch of a tractor and so that the PTO connector 29 on the upper end of the

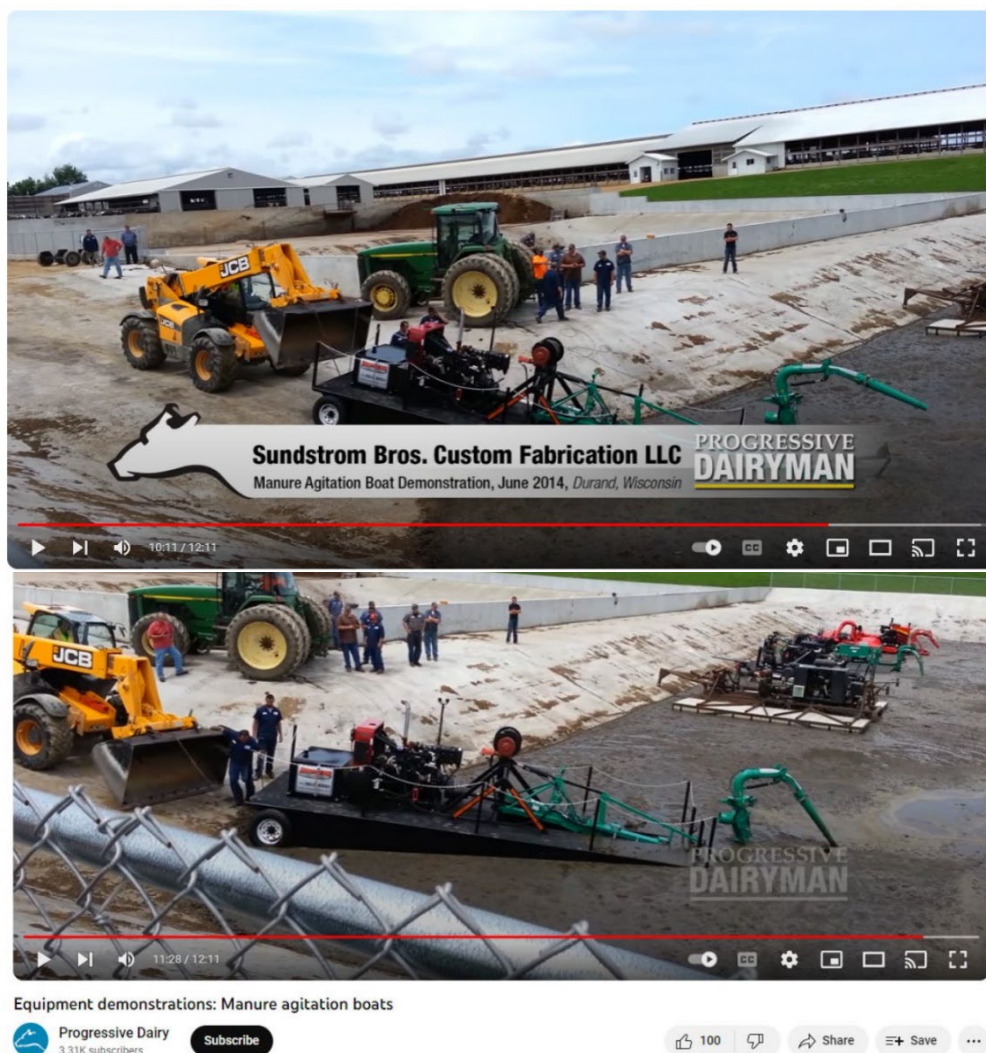
boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Puck's power source.

301. If a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump, then the resulting combination would look like this:



302. My opinion regarding how a POSITA would go about adding Nuhn's Pit Pump to Puck, if they were so motivated, is not based on speculation (like Dr. Winkel's opinion), but rather is based on record evidence. In particular, I note that both Sundstrom (EX1153, EX1154, EX1156) and the Puck Prototype (EX1159) show other POSITAs' attempts at adding boom-mounted pumps to manure agitation boats/barges. In both cases, Sundstrom and Puck retained the boom arm, pivot structure, and pivot functionality of the pumps so that the boom-mounted pump could be tilted down and up into and out of the lagoon.

303. Sundstrom's floating manure agitator included a GEA Houle liquid manure pump mounted on the front end of a long boom arm. The boom arm extends forward at an angle that can be tilted up and down to a limited degree.

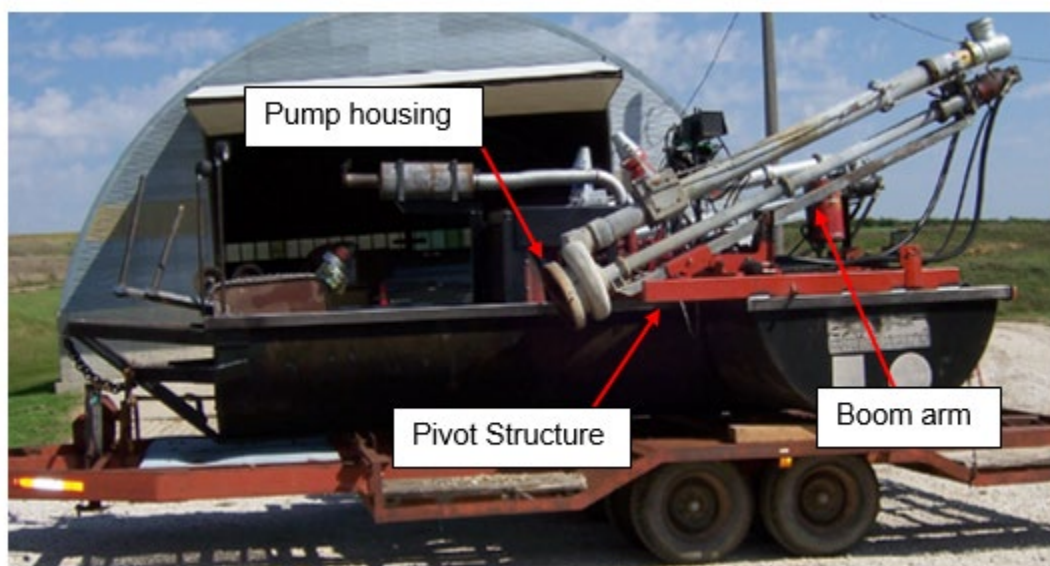


EX2008, 8-9.



EX1156, at 1.

304. The Puck Prototype included two submersible, boom-mounted pumps positioned on the right and left sides of the floating barge:



EX1159, p. 3.



EX1159, p. 5.

As shown in the photographs above, the submersible pumps are mounted on the far end of a boom arm that can tilt/swing up and down and be lowered into and out of the manure lagoon.

305. Both Sundstrom and the Puck Prototype reflect what other POSITAs in the art actually did during the same approximate time period (i.e., same decade) as Nuhn's invention. This evidence leads me to the conclusion that a POSITA would have mounted Nuhn's Pit Pump to Puck's boat with little modification, if they were motivated to make such a combination in the first place, and that they would have retained the long 10ft boom arm, pivot structure, and pivot functionality of Nuhn's Pit Pump because that is entirely consistent with what Sundstrom and Puck actually did.

306. On the other hand, this record evidence does not support Petitioner's combination, which does away with the pivot structure and pivot functionality of Nuhn's Pit Pump, and either significantly shortens the boom arm or does away with it completely. None of those modifications were made by Sundstrom or Puck, let alone vertically orienting a submersible manure pump in a constant angular orientation relative the floatable vehicle body.

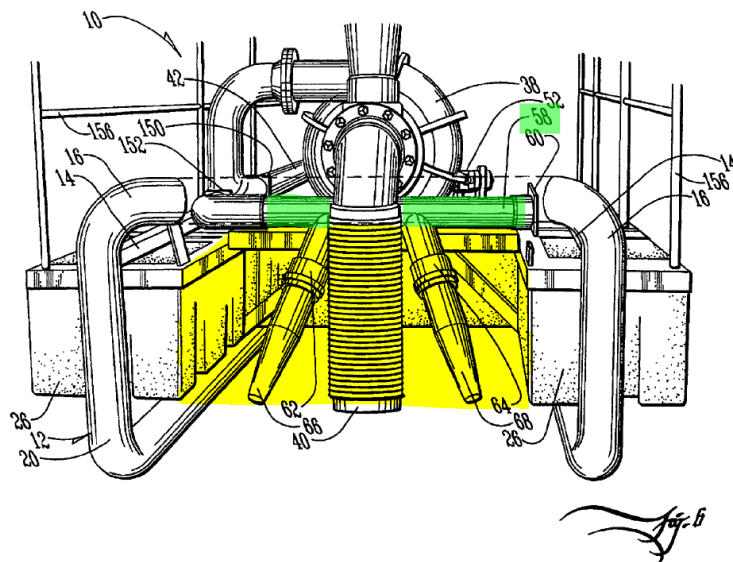
307. In view of the above analysis, if a POSITA were to add Nuhn’s Pit Pump to Puck’s boat, that combination would result in a pump at the far end of an articulating boom arm so that it could swing up and down in the same manner as when Nuhn’s Pit Pump is attached to a tractor. Thus, the combination of Manure-Manager and Puck would not result in a vehicle where the liquid manure pump “has a constant angular orientation relative to the floatable vehicle body” as required by Substitute Claim 79.

3. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST THE CLAIMED POSITION OF THE LIQUID MANURE PUMP, WHERE SUBMERGED PORTIONS OF THE VEHICLE ARE POSITIONED DIRECTLY FORWARD OF AND DIRECTLY REARWARD OF THE PUMP HOUSING

308. The Puck Combination fails to teach or suggest the position of the pump housing of the liquid manure pump recited in Substitute Claim 79, which requires submerged portions of the vehicle to be positioned directly forward of and directly rearward of the pump housing:

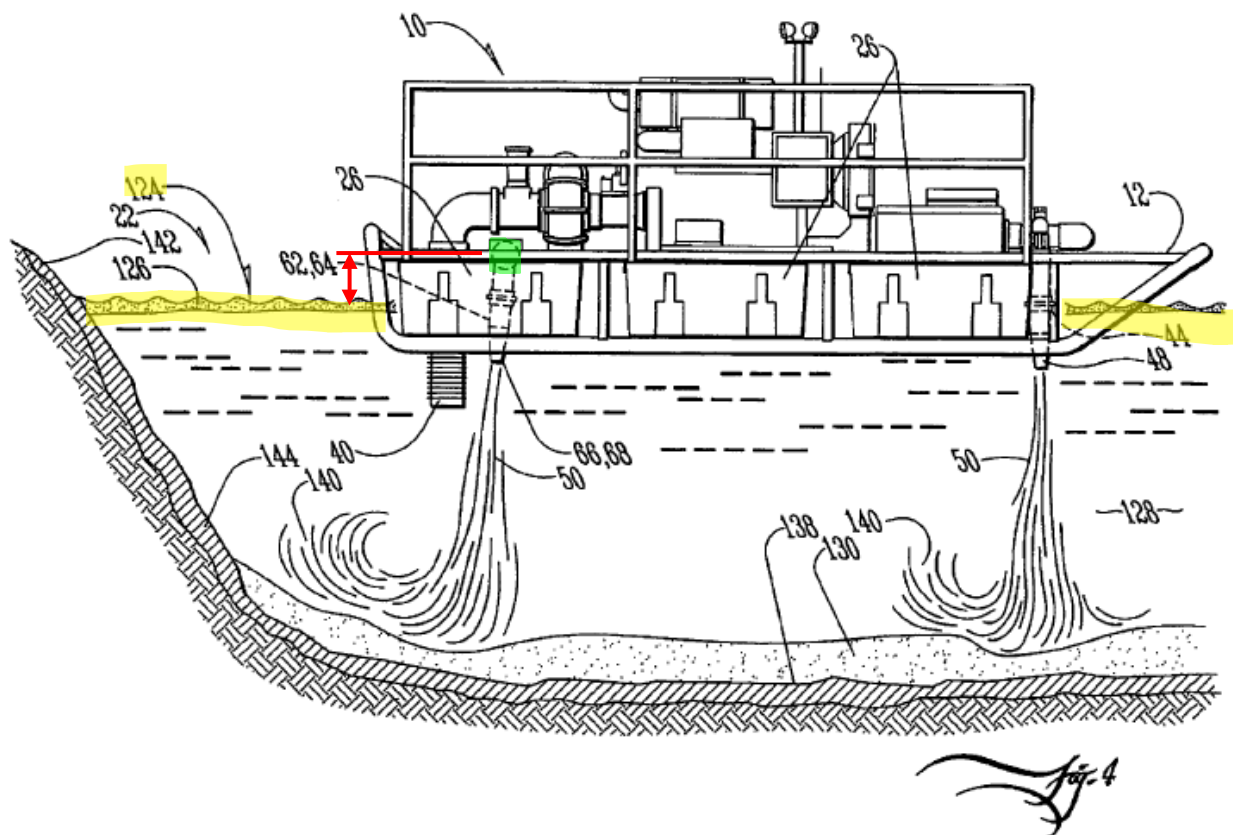
“wherein portions of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump”

309. The rear of Puck’s boat has a U-shaped cut-out between the floating dock sections (26) where the liquid manure intake pipe (40) is positioned, with a ninety-degree bend so that the intake pipe extends down into the manure lagoon.



EX1014, Fig. 6, p. 7.

Even if a POSITA positioned Nuhn's Pit Pump in this space, as Petitioner suggests, there would be no submerged portions of the vehicle that "are spaced from and positioned ... directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing", as required by the language of the Substitute Claim 79. This is due to the fact that the rear nozzle yoke 58 disclosed in Puck is **forward** of the intake pipe 40 and is not a submerged portion of the vehicle because the rear nozzle yoke 58 is spaced **above** the top of the buoyant elements 26 and therefore is above the surface 124 of the manure lagoon.



EX1014, Fig. 4, p. 5.

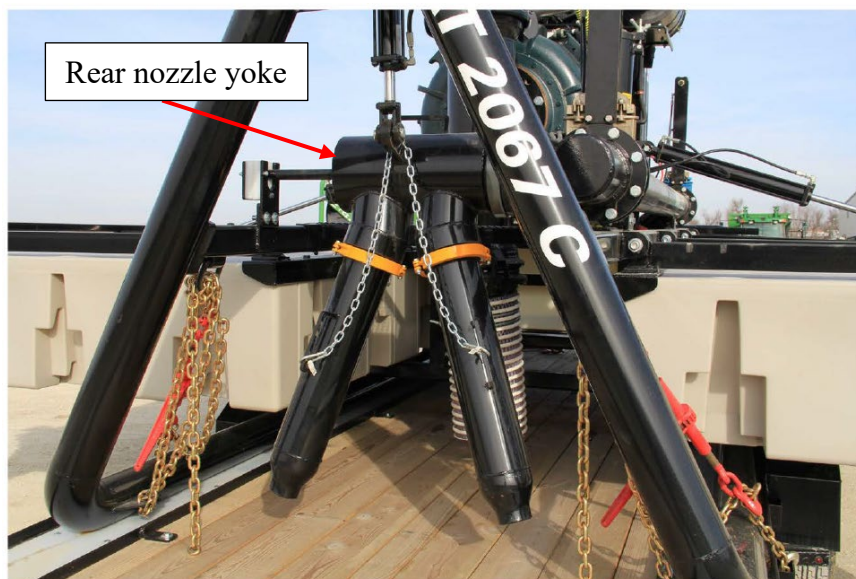
310. The Puck Boat is the commercial embodiment of the vehicle described in U.S. Publication No. 2013/0145980 (EX2107, Puck II).



As shown above, in Puck II, the rear nozzle yolk 124 is also positioned **forward** of the downwardly directed intake pipe 100 and is spaced **above** the top of the buoyant elements 36 and therefore is

above the surface 198 of the manure lagoon.

311. Unlike in Puck II, where the rear nozzle yolk 124 is positioned forward of the downwardly directed intake pipe 100, the rear nozzle yolk on the Puck Boat (i.e., the commercial embodiment) is positioned behind the downwardly directed intake pipe near the rear “A” frame structure.



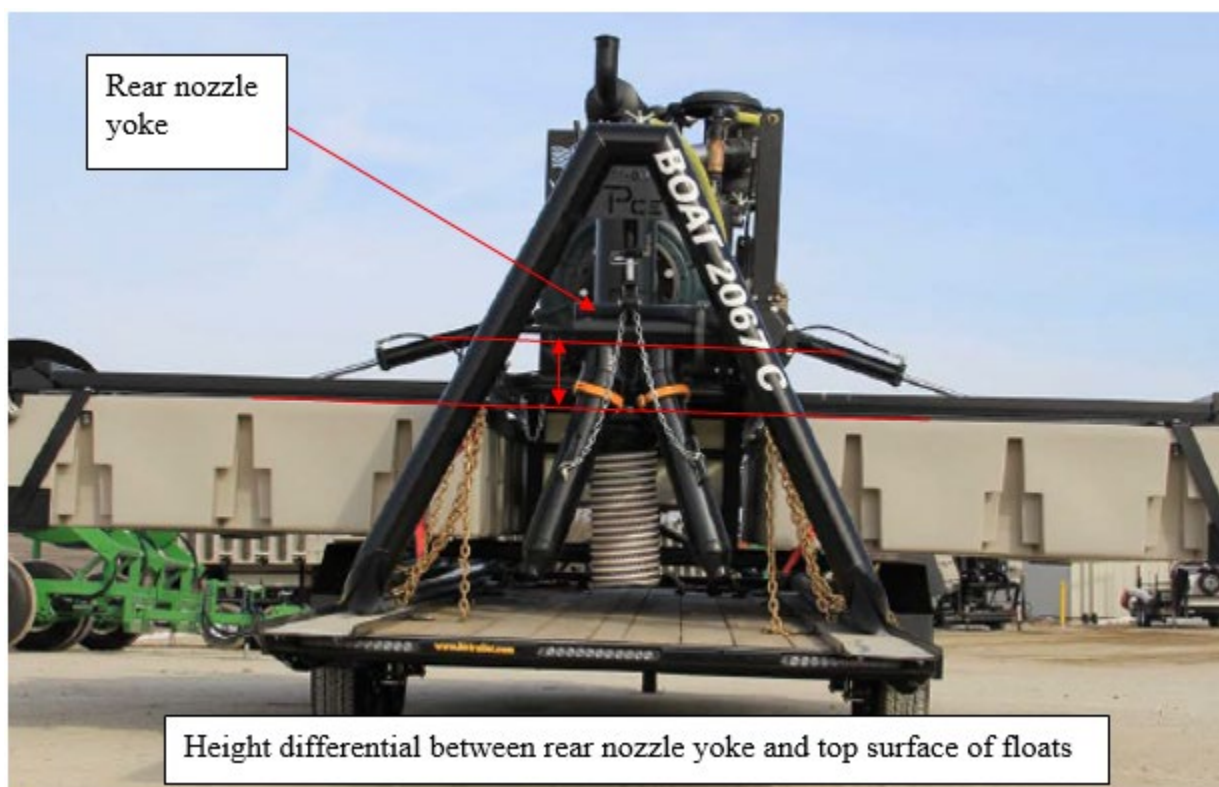
EX1164, p. 41.

312. As discussed above, Nuhn’s Pit Pump is designed to swing up and down, which is a feature that a POSITA would have retained. A POSITA therefore would have positioned the rear nozzle yolk forward of Nuhn’s Pit Pump (like in the configuration disclosed in Puck II) so that the rear nozzle yolk would not interfere with the pivoting pump. In my opinion, a POSITA would not have selected the alternative configuration used on the Puck Boat, where the rear nozzle yolk is rearward of the downwardly directed intake pipe, because a POSITA would have recognized that Nuhn’s Pit Pump would contact the rear nozzles and/or rear nozzle yolk when pivoted upward and to the rear of the boat for storage, transport, launching, and retrieval. This interference would have significantly limited the angle one could tilt Nuhn Pit Pump upward – a problem that would be avoided by selecting the position of the rear nozzle yolk disclosed in Puck II. As a result, a POSITA would have logically followed the teachings of Puck II’s rear nozzle

placement instead of the alternative location for the rear nozzles on Puck's Boat.

313. But even if a POSITA would have selected the placement of the rear nozzle yoke used on the Puck Boat (i.e., Puck's commercial embodiment), this is not a submerged portion of the vehicle nor is it directly rearward of the pump housing as required by the language of Substitute Claim 79.

314. Like in Puck and Puck II, the rear nozzle yoke used on the Puck Boat is spaced above the top of the buoyant elements (i.e., the floats) by several inches.

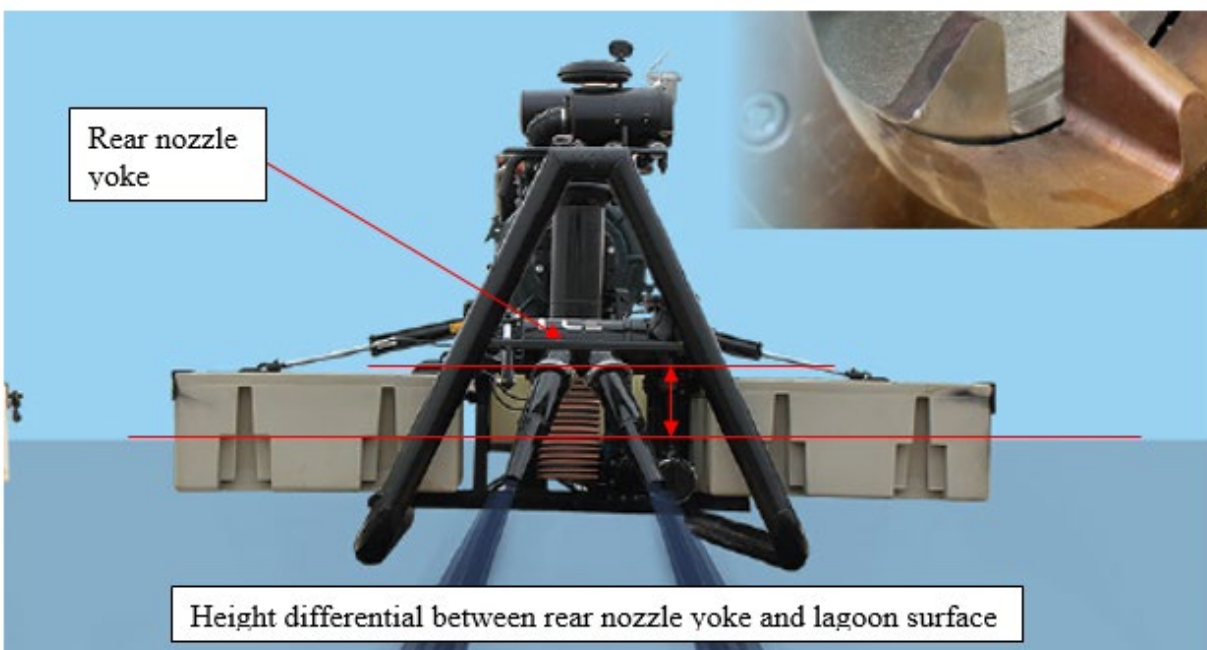


EX1164, p. 18.

315. The top of the buoyant elements (floats) are not submerged when the Puck Boat is floating so a POSITA would not understand the rear nozzle yoke to be a submerged portion of the vehicle, as required by Substitute Claim 79.



EX1169, p. 2 (annotated).

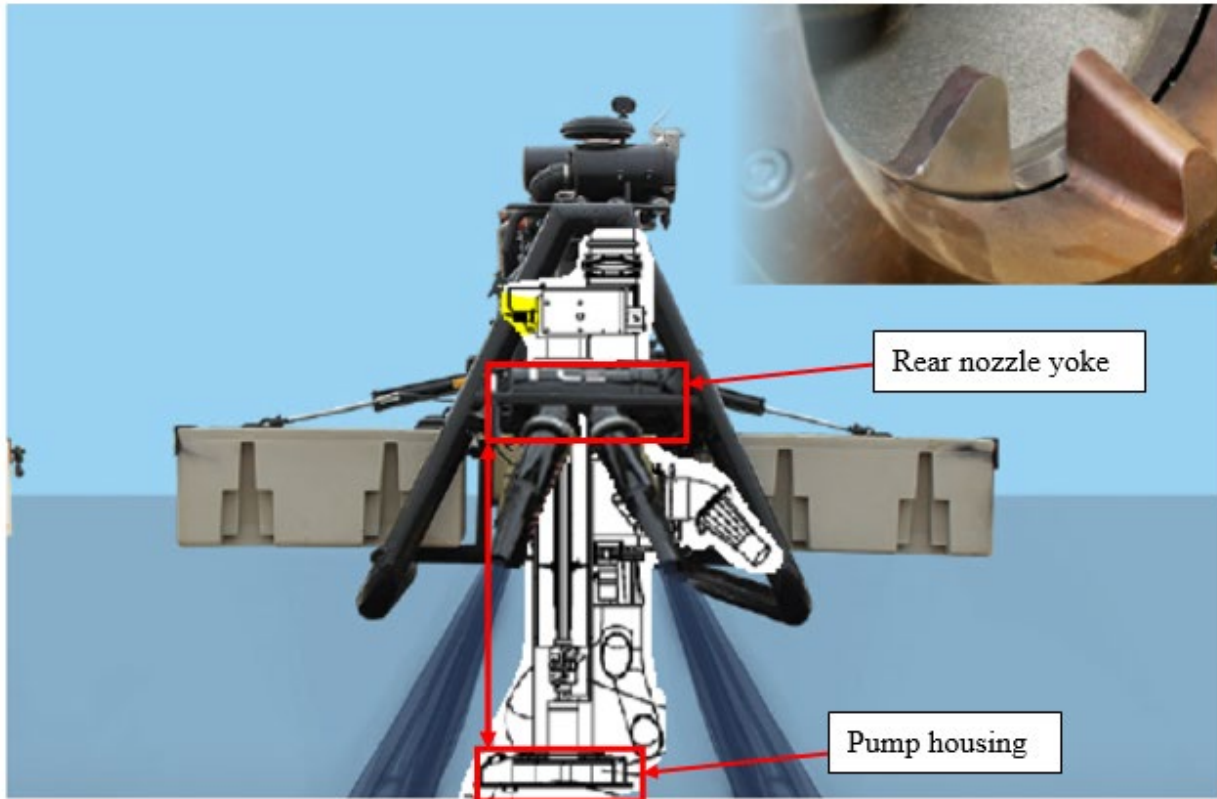


EX1160, p. 2 (annotated).

316. The photographs above demonstrate that the rear nozzle yoke of the Puck Boat cannot be fairly characterized as a portion of the vehicle that is submerged when the vehicle is

floating, as Substitute Claim 79 requires.

317. Nor would the rear nozzle yoke of the Puck Boat be positioned “directly rearward of the pumping housing” if the proposed combination were adopted. Dr. Winkel asserts that a POSITA would shorten Nuhn’s Pit Pump and place it in the location of Puck’s downwardly directed intake pipe. So the combination would look something like this:



EX1160, p. 2 (annotated).

A POSITA would not consider the rear nozzle yoke of the Puck Boat as being “directly rearward of the pump housing” due to the height differential between the components. Even if the pump housing were positioned along the bottom of the buoyant elements (floats), the rear nozzle yoke would be vertically spaced above the pump housing, rather than directly rearward of the pump housing, because the rear nozzle yoke is spaced above the top of the buoyant elements (floats).

318. A POSITA would understand the language of Substitute Claim 79 requiring a submerged portion of the vehicle to be “directly rearward” of the pump housing as defining a three-

dimensional geometric relationship where the submerged portion of the vehicle must be behind the pump housing and must be at substantially the same height (i.e., submerged depth) and substantially the same lateral position (i.e., not offset to the right or left) as the pump housing. This stands in contrast to the language of Substitute Claim 57, where the submerged portion of the vehicle need only be “rearward of the pump housing along the longitudinal centerline,” which a POSITA would understand as defining a two-dimensional geometric relationship where the submerged portion of the vehicle must be behind the pump housing and must have the same lateral position (i.e., not offset to the right or left) as the pump housing. In other words, because Substitute Claim 57 does not use the phrase “directly rearward”, it does not require the submerged portion of the vehicle to be at substantially the same height/depth as the pump housing, it just needs to be submerged and positioned on the longitudinal centerline of the floatable vehicle body.

319. Thus, even if the boom arm of Nuhn’s Pit Pump were substantially shortened, as Petitioner argues (and shown above), the rear nozzle yoke of the Puck Boat would still be spaced well above the pump housing and there would be an **unobstructed** path to the pump housing from the rear (i.e., when viewed from the rear, the rear nozzle yoke would not obstruct from view any portion of the pump housing, which the claims define as the structure that houses the impeller.) A POSITA would not understand there to be a submerged portion of the vehicle that is “directly rearward of the pump housing” in view of this unobstructed path/view to the pump housing from the rear of the boat.

320. Furthermore, as a result of this height differential and unobstructed path to the pump housing from the rear of the boat, the rear nozzle yoke would not be positioned to “keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump” as Substitute Claim 79 requires.

321. In view of the above analysis, if a POSITA were to add Nuhn’s Pit Pump to Puck and adopt the location of the rear nozzle yoke used on the Puck Boat (i.e. the commercial embodiment), the combination would still fall short of the configuration recited in Substitute Claim

79, where “portions of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to each side of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump” as required by Substitute Claim 79.

322. I also disagree with Dr. Winkel’s alternative argument that a POSITA would add a floating dock section (i.e., buoyant element) behind the pump housing of Nuhn’s Pit Pump. This argument is entirely hindsight bias, as it is not taught or suggested by any prior art reference or other record evidence.

**4. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST A
“HYDRAULICALLY POWERED LIQUID MANURE MOVER” AND A
“POWER SOURCE CONFIGURED TO PROVIDE POWER TO BOTH THE
GROUND ENGAGING PROPULSION STRUCTURE AND THE LIQUID
MANURE MOVER”**

323. Neither Puck, the Puck Boat, Bryham, or Manure-Manager disclose “a hydraulically powered liquid manure mover” and “a power source that provides power to both the ground engaging propulsion structure and the liquid manure mover” as required by the language of Substitute Claim 79.

324. The manure pumps in Puck and the Puck Boat are mechanically powered as is Nuhn’s Pit Pump.

325. With respect to the hydraulic system, Puck discloses a hydraulic pump 54 that is powered by a 12-volt battery 56. EX1014, Para. [0027]. A POSITA would have recognized that such a system would not be capable of powering any manure pump, let alone Nuhn’s Pit Pump, which requires a minimum of 95 horsepower. EX2115, p. 2. As a result, a POSITA would have installed Nuhn’s Pit Pump such that its input shaft could be coupled to and mechanically powered by Puck’s engine, if they were motivated to make the combination in the first place.

326. Dr. Winkel attempts to correct this by now making the unsupported argument that

Bryham’s hydraulic system could somehow be used to power both the ground engaging wheels and Nuhn’s Pit Pump. EX1174, ¶59. But Dr. Winkel has not shown that a POSITA would expect Bryham’s hydraulic system to be capable of powering Nuhn’s Pit Pump. The record suggests that it would not.

327. Maurice Bryham testified in his deposition that the optional firefighting pump they used in some of their vehicles was powered by a secondary inboard engine with an effective output of 24 horsepower. EX1176, pp. 111, 117. A POSITA would not reasonably expect Bryham’s secondary inboard engine and hydraulic system to be capable of powering Nuhn’s Pit Pump when Bryham’s system had an output of about 24 horsepower and Nuhn’s Pit Pump had a minimum of 95 horsepower.

328. In view of the above analysis, if a POSITA were to add Nuhn’s Pit Pump to Puck, they would have mechanically driven Nuhn’s Pit Pump by coupling the input drive shaft on Nuhn’s Pit Pump to the output shaft of Puck’s motor. Thus, the result of this combination would not have been a hydraulically powered liquid manure mover where “a power source that provides power to both the ground engaging propulsion structure and the liquid manure mover” as required by the language of Substitute Claim 79.

5. THE PUCK COMBINATION FAILS TO DISCLOSE “WIRELESS REMOTE CONTROL CONFIGURED TO ... (1) CONTROL THE GROUND ENGAGING PROPULSION STRUCTURE”

329. Puck’s remote-control system is limited to turning the engine on and off, controlling engine speed, turning the nozzles on and off, and controlling nozzle direction. *See* EX1014, Puck, ¶¶ [0032]-[0033]. Puck also lacks any sort of ground engaging propulsion structure. As a result, Puck’s remote-control system does not provide “wireless remote control configured to enable an operator who is remote from the vehicle to ... (1) control the ground engaging propulsion structure” as required by the language of Claim 41. And Bryham lacks any discussion of remote control and therefore fails to supply this element missing from Puck.

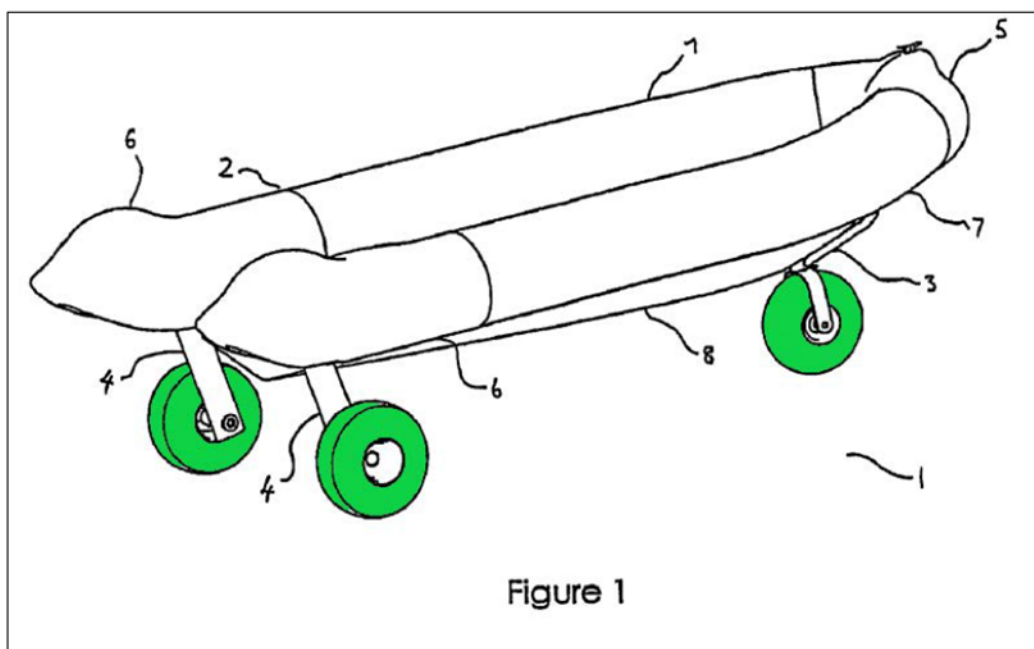
330. Dr. Winkel argues that a POSITA would have been motivated to configure the remote-control steering system of Puck (used while the boat of Puck is floating) to control the speed and direction of Bryham's wheels while the vehicle is ground engaging. EX1004, Winkel Decl., ¶¶349-350. But this argument fails to address whether a POSITA would have a reasonable expectation that Puck's remote-control system for controlling movement while floating in the manure lagoon could be successfully modified and used for control over Bryham's steering and propulsion system (i.e., Bryham's wheels) while Puck's boat is on the ground. Again, POSITA would understand that just because *some* vehicles can be remote controlled does not mean that *all* vehicles can be remote controlled.

6. THE PUCK COMBINATION FAILS TO DISCLOSE “A GROUND ENGAGING PROPULSION STRUCTURE COMPRISING A SET OF FOUR GROUND ENGAGING WHEELS”

331. The Puck Combination fails to teach or suggest that the ground engaging propulsion structure comprises a set of four ground engaging wheels as required by Substitute Claim 79:

“a ground engaging propulsion structure comprising a set of four ground engaging wheels and wherein each ground engaging wheel is powered by its own variable speed hydraulic motor”

332. As shown below, Bryham discloses a three-wheeled arrangement, where a single, steerable wheel is provided at the bow of the boat hull:



333. So if a POSITA were even motivated to add Bryham's wheels to Puck, the resulting combination would only include 3-wheels, not four. Stated differently, if a POSITA simply added Bryham's wheels to Puck's vehicle, the resulting combination would not satisfy the language of Substitute Claims 79 because the combination would not have "a set of four ground engaging wheels."

334. I disagree with Dr. Winkel's opinion that a POSITA would deviate from Bryham's three-wheel arrangement and instead select a four-wheel arrangement. In my opinion, if a POSITA were motivated to depart from Bryham's three-wheel arrangement, then they would configured the vehicle to have six or more wheels because that is what is taught in the art describing other amphibious vehicles.

335. The prior art is ubiquitous in its teaching of amphibious vehicles with two rows of **three (3) or more wheels positioned on opposing sides** of the floatable vehicle body. For example, Carrier I (EX1005) discloses an eight (8) wheeled amphibious vehicle with two rows of four (4) wheels on opposing sides of the floatable vehicle body:

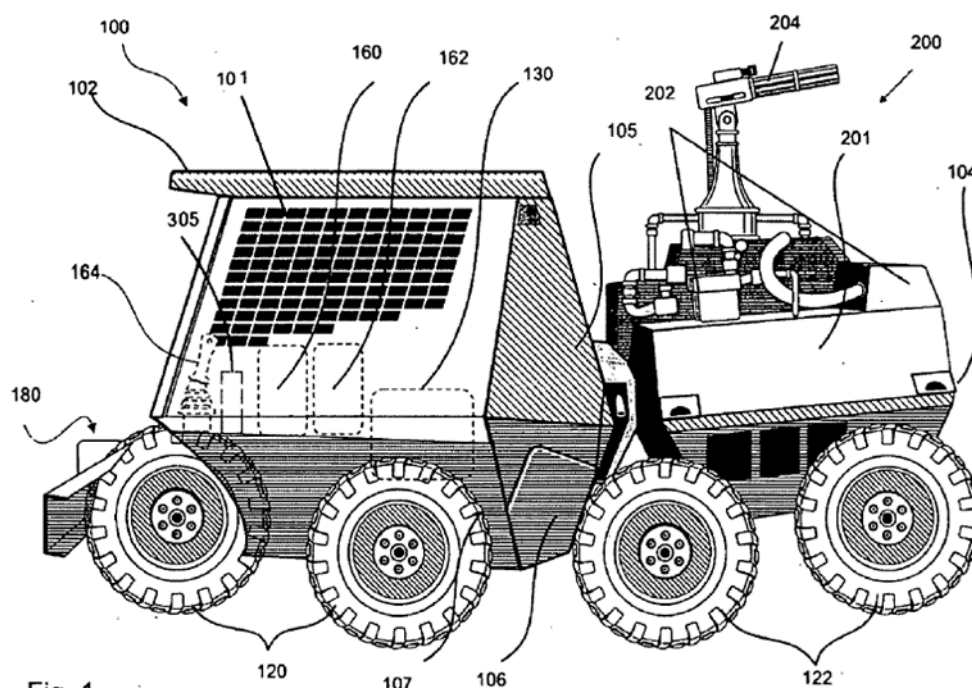
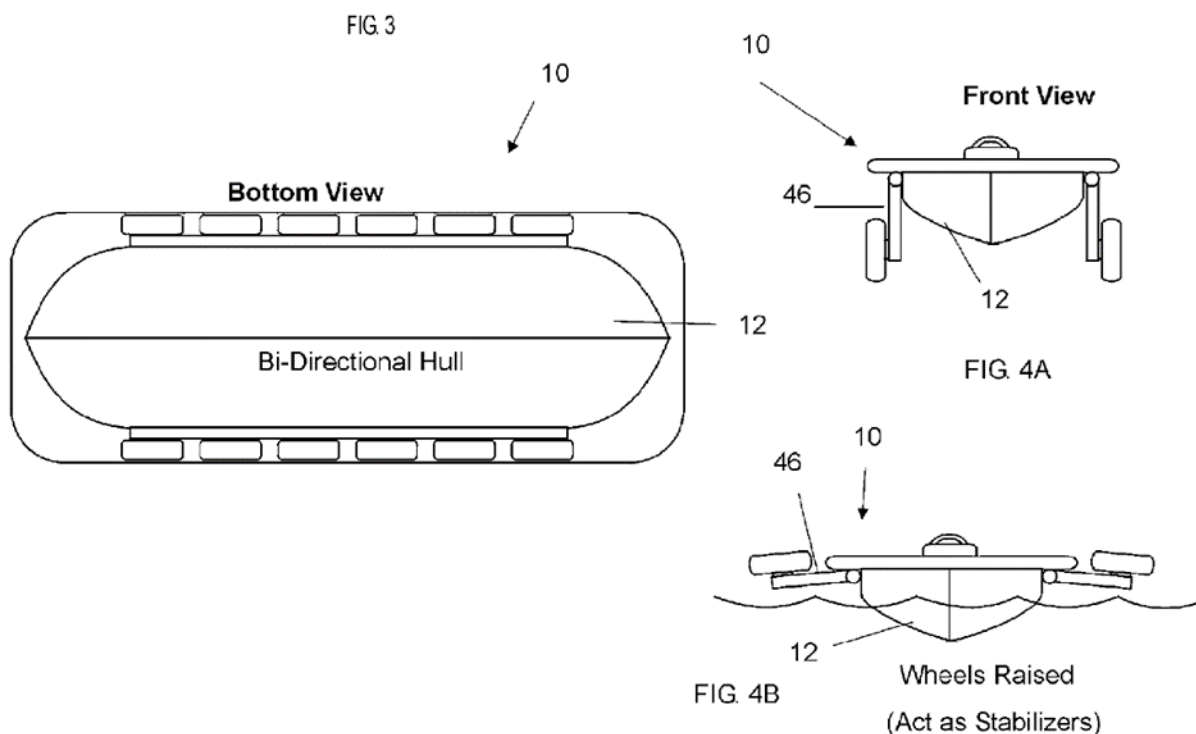


Fig. 1

EX1005 at p. 2. Carrier II (EX1020) discloses a twelve (12) wheeled amphibious vehicle with two rows of six (6) **retractable** wheels on opposing sides of the floatable vehicle body:



EX1020 at p. 4. In another example, SenwaTec (EX1012) discloses an amphibious vehicle with two rows of three (3) wheels on each side of the floatable vehicle body:



6-Wheel driven unit with stabilizer pontoons



EX1012 at p. 1; EX1013 at p. 15. Bailey (EX2084) discloses amphibious vehicle configurations that have six, eight, and fourteen wheels and teaches away from conventional four wheeled “off-road” vehicles (as distinguished from amphibious vehicles).

336. I disagree that a POSITA would have added Bryham’s wheels to Puck in the first place. I also disagree that a POSITA would have found it obvious to deviate from the number and arrangement of wheels disclosed in Bryham if they were to add Bryham’s wheels to Puck. Indeed, the references themselves do not teach or suggest the alternative arrangement Petitioner proposes, where Bryham’s single, front wheel is discarded and replaced by a duplicate set of Bryham’s rear wheels at the front of the vehicle.

337. However, for argument sake, if a POSITA were to deviate from the three-wheeled (tricycle) arrangement disclosed in Bryham, the prior art would lead them to place a row of three or more wheels along **each side** of Puck’s frame, which is what Carrier I (EX1005), Carrier II (EX1020), SenwaTec (EX1012), and Bailey (EX2084) disclose. According to Petitioner and Dr. Winkel, a POSITA would have deviated from the three-wheeled (tricycle) arrangement described in Bryham because unlike the V-shaped hull arrangement in Bryham, Puck’s boat has a rectangular shaped body. Carrier, Carrier II, SenwaTec, and Bailey all disclose vehicles with rectangular shaped bodies. As a result, a POSITA would have looked to the wheel arrangements disclosed in these references if they were somehow motivated to add duplicate sets of Bryham’s rear wheels to

Puck.

338. Thus, if a POSITA were somehow motivated to add multiple sets of Bryham's rear wheels to Puck's boat, and followed the teachings of other wheeled amphibious vehicles (like Carrier I, Carrier II, SenwaTec, and Bailey), the resulting combination, if made, would include a set of at least 6 wheels – and not a set of four wheels as required by Substitute Claim 79.

339. This difference is not trivial. Nuhn's 4-wheel arrangement provides added stability when traversing steep banks of manure lagoons because all 4 wheels remain on the ground during breakover and are designed to allow the vehicle to sink into the crust/muck, so that the floatable vehicle body and wheels can break up the crust and create a working pocket for the liquid manure pump under/around the vehicle. In my opinion, a POSITA would not have appreciated these advantages / unexpected results of Nuhn's 4-wheel arrangement because it goes against the teachings of the low ground-pressure amphibious vehicles described in the prior art. In other words, the prior art would have led a POSITA to design a low ground-pressure amphibious vehicle with six (6) or more wheels. There is nothing in the prior art that would have taught a POSITA that they would actually want to configure the wheels and buoyant elements so as to allow the vehicle to sink into the crust/muck of a manure lagoon.

NN. Claim 80

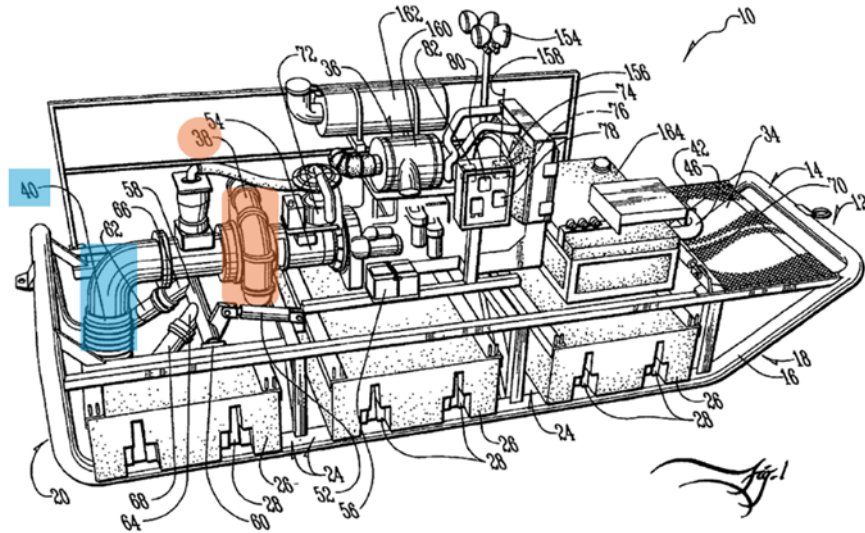
1. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST THE CLAIMED POSITION OF THE LIQUID MANURE PUMP, WHERE THE PUMP HOUSING IS MOUNTED TO THE UNDERSIDE OF THE FLOATABLE VEHICLE BODY

340. The Puck Combination fails to teach or suggest the arrangement where the pump housing of the liquid manure pump is mounted to the underside of the floatable vehicle body as recited in Substitute Claim 80:

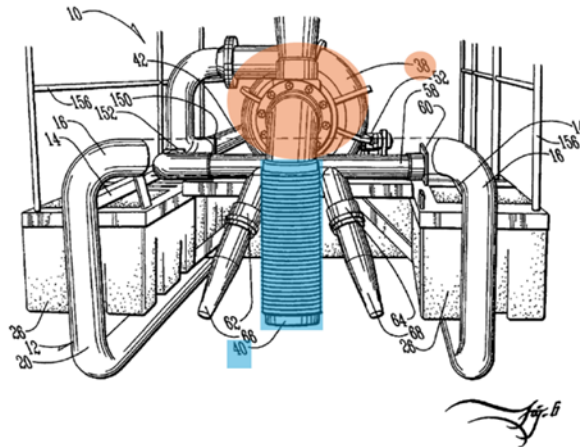
“the pump housing is mounted to the underside of the floatable vehicle body at a location that is rearward of the front of the floatable vehicle body and forward of

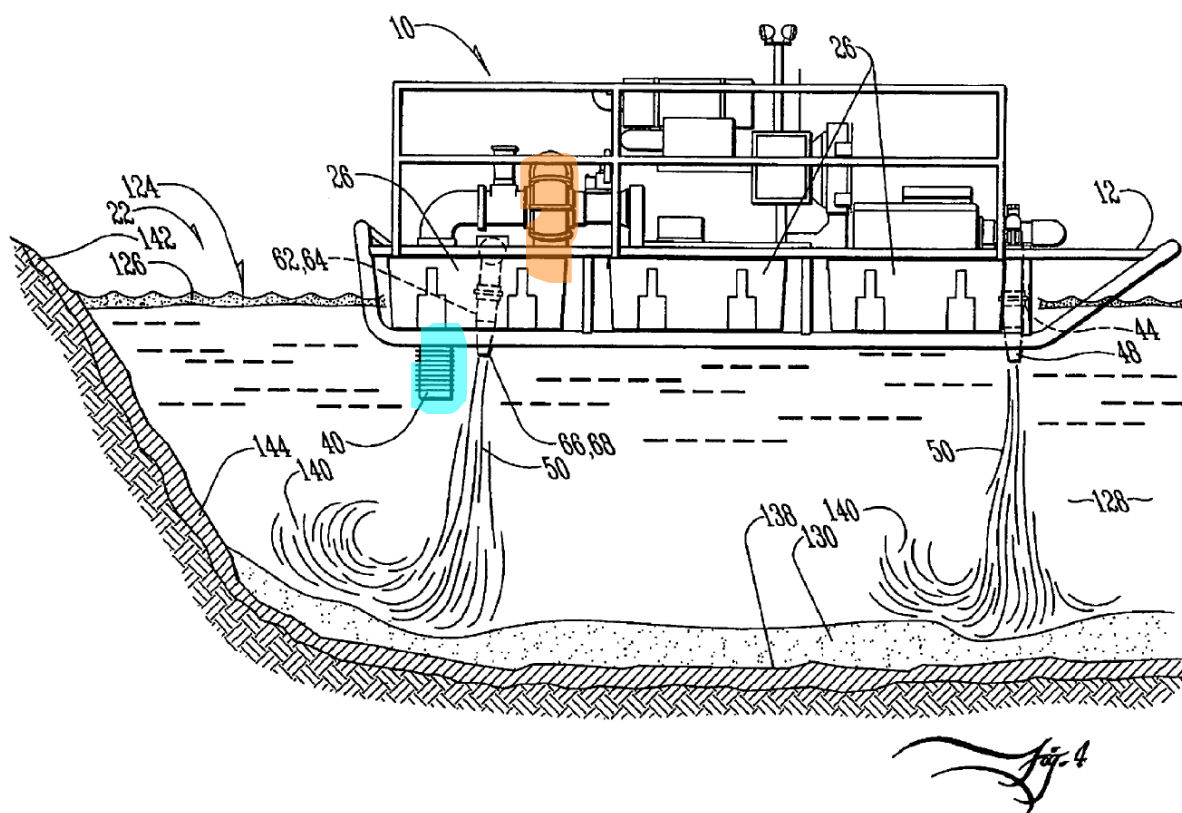
the rear of the floatable vehicle body”

341. Puck discloses a manure agitation boat including a slurry pump (38) that is mounted to the top deck, above the floating dock sections (26):



EX1014 at 2 (annotated).





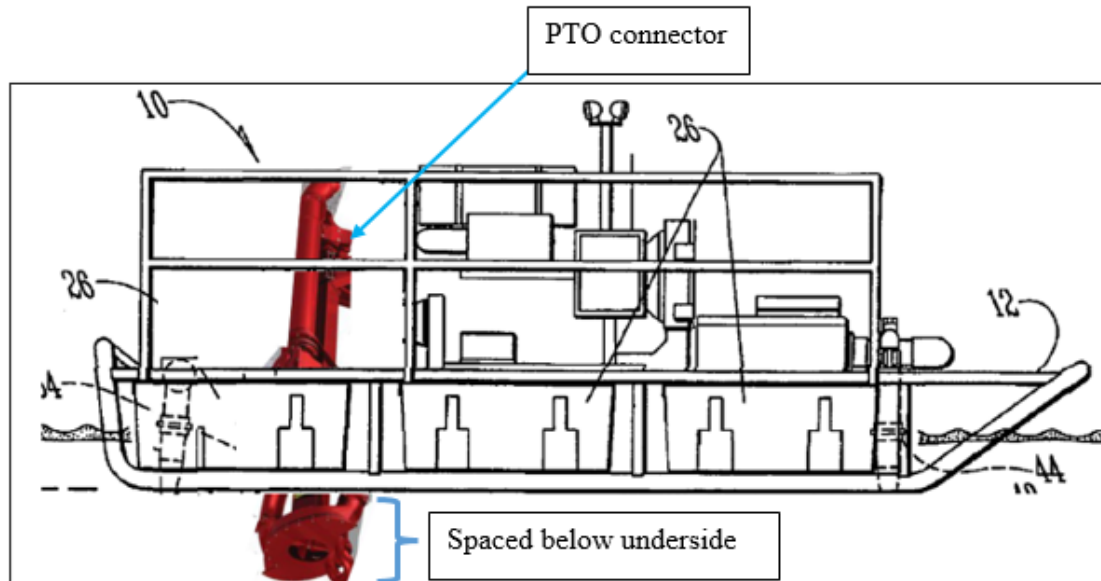
EX1014 at 5, 7 (annotated).

342. The pump housing (in orange) is not mounted to the underside of the boat.

343. A POSITA looking to the teachings of Puck when attempting to design a new manure lagoon agitation vehicle would logically follow its disclosure, which teaches mounted a non-submersible pump to the top deck of the floatable vehicle body where it is high and dry. Puck does not teach or suggest the claimed arrangements where the housing of the liquid manure pump is mounted to the underside of the floatable vehicle body.

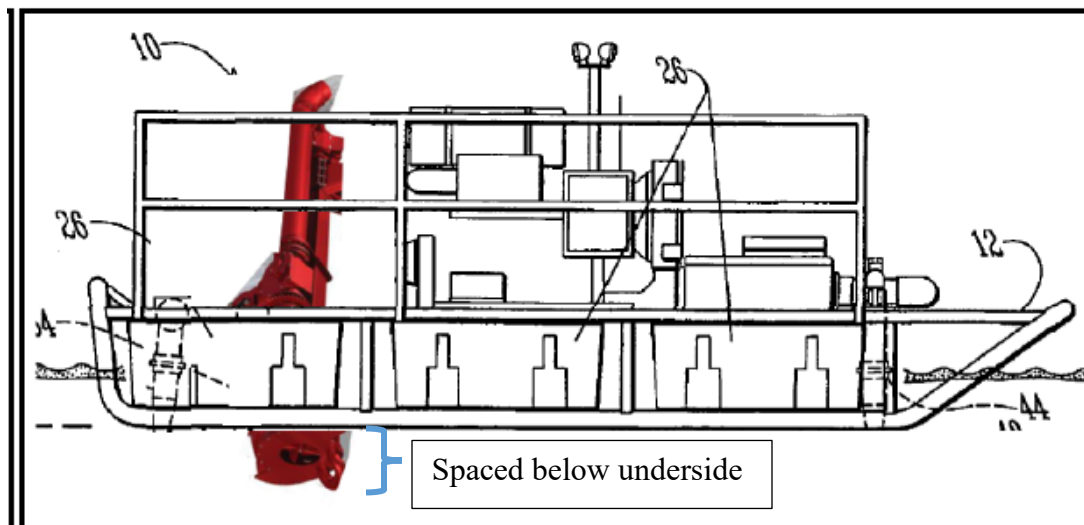
344. I disagree with Dr. Winkel's combination of Manure-Manager with Puck, as shown below, because Dr. Winkel advocates mounting Nuhn's Pit Pump in a location that would be

illogical to a POSITA based on the teachings of Manure-Manager and Puck.



EX1109 in IPR2023-01161, ¶143.

Dr. Winkel attempts to correct this in the present IPR, by moving the pump even higher, but these modifications are illogical absent hindsight bias and are contrary to other record evidence (e.g., EX1156 and EX1159) showing how a POSITA would have added Nuhn's Pit Pump to Puck around the time of the invention, if they were motivated to do so.



EX1174, ¶44.

345. Manure-Manager teaches a POSITA to locate a submersible manure pump at the lower end of a boom arm. The upper end of the boom arm opposite the manure pump is configured to be attached to the three-point mount on a tractor and the manure pump is powered/driven by the power-take-off (PTO) of the tractor, which couples to a driveshaft located at the upper end of the boom arm:



EX1088, p. 27.

346. Fig. 2 of Nuhn's '758 Patent clearly depicts the PTO connector 29 at the upper end of the boom arm 1 where the driveshaft couples the PTO of the tractor to the gearbox of Nuhn's Pit Pump:

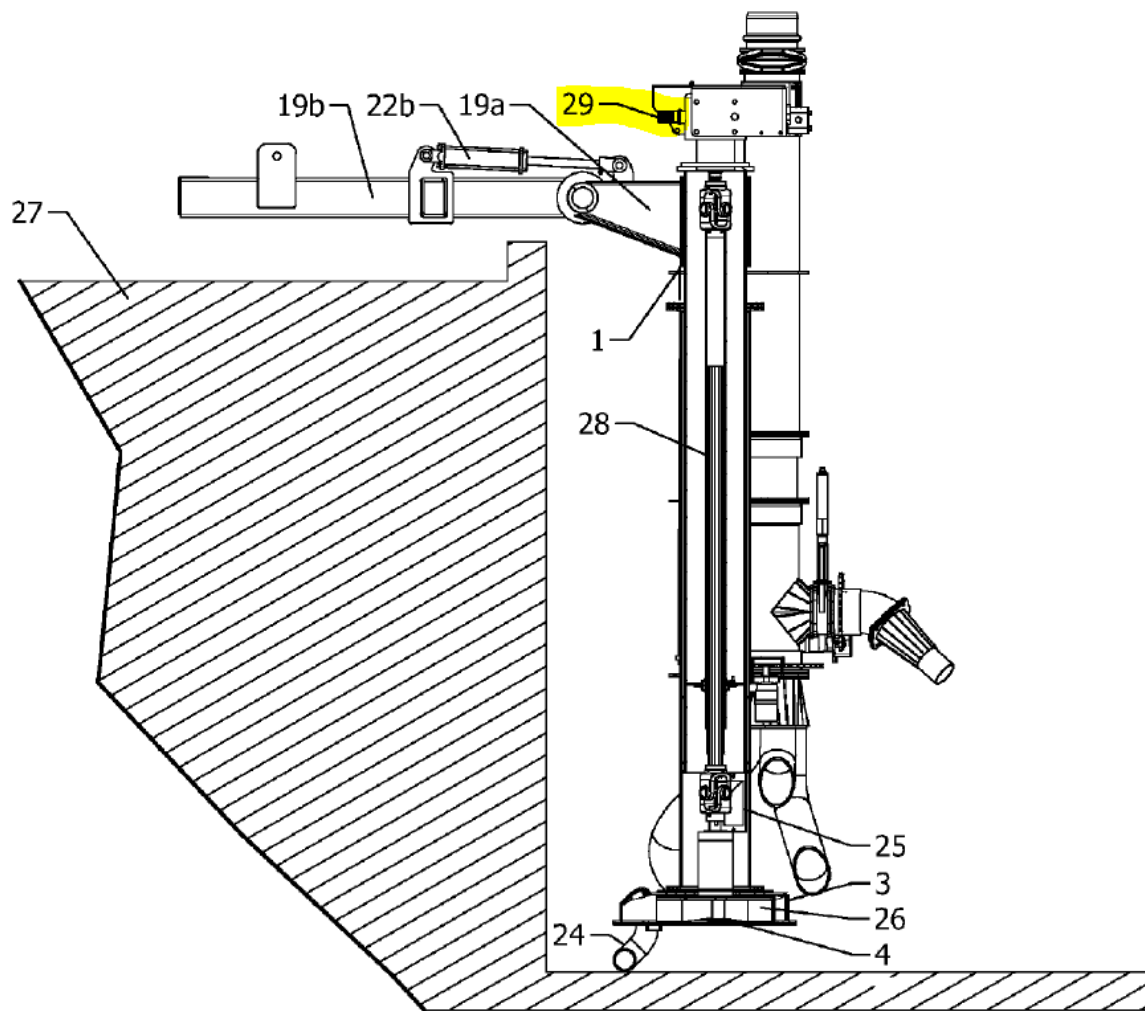
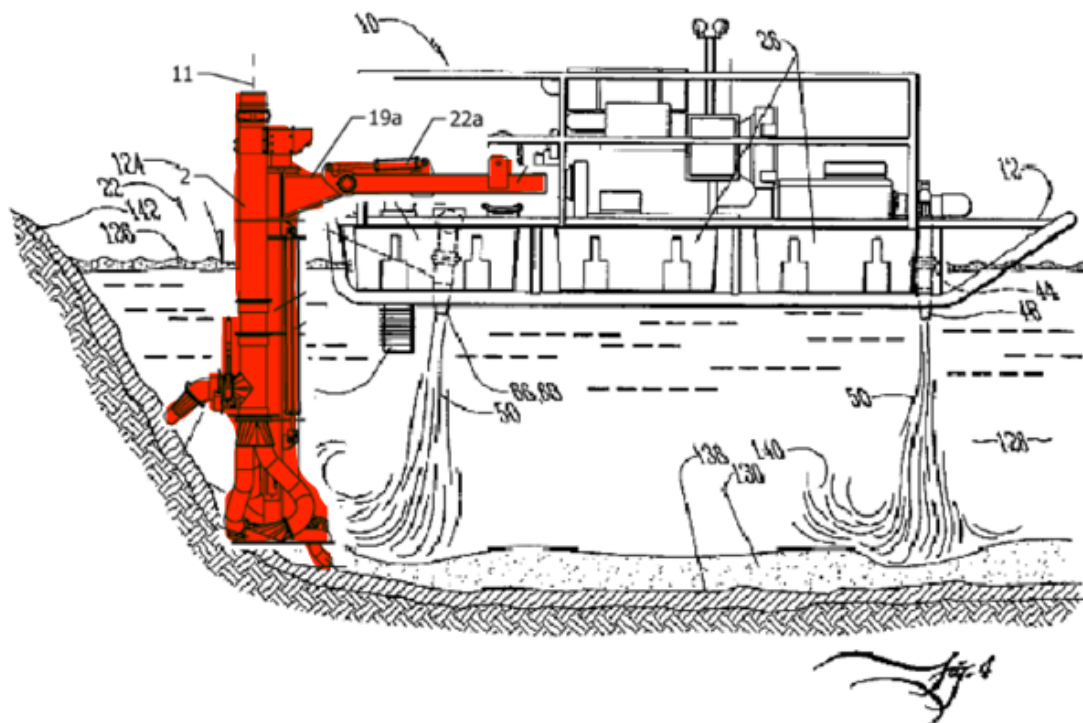


FIG. 2

EX2101, Fig. 2.

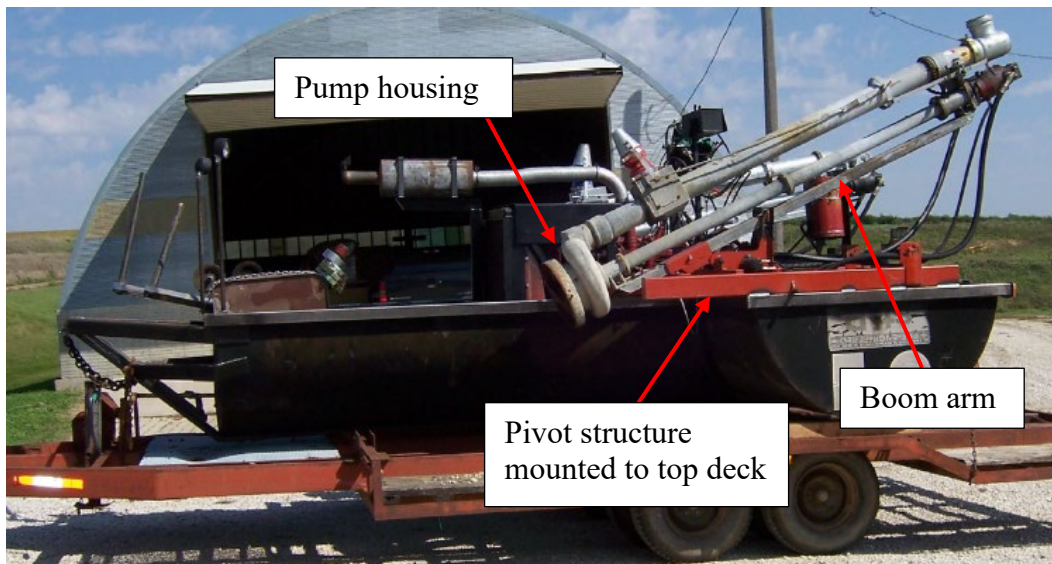
347. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the pivot of arm 19a to the rear of Puck's deck so that the PTO connector 29 on the upper end of the boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Puck's power source.

348. If a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump, then the resulting combination would look like this:



349. Petitioner glosses over the language in Claim 80 requiring the pump housing to be **mounted to** the underside of the floatable vehicle body – as opposed to simply being “positioned along the underside” like in Claims 41 and 57 – and ignores record evidence showing that both Puck and Sunstrom installed boom mounted pumps to the top deck – not to the underside.

350. Puck's prototype and Sundstrom both demonstrate that if a POSITA were motivated to add Nuhn's Pit Pump to Puck's boat, they would have retained the boom and pivot structure of Nuhn's Pit Pump and would have mounted the pivot structure to the top deck of Puck's boat.



EX1159, p. 3.



EX1156, at 1.

351. In view of the above analysis, the Puck Combination would not result in a vehicle where “the pump housing is mounted to the underside of the floatable vehicle body” as required by Substitute Claim 80.

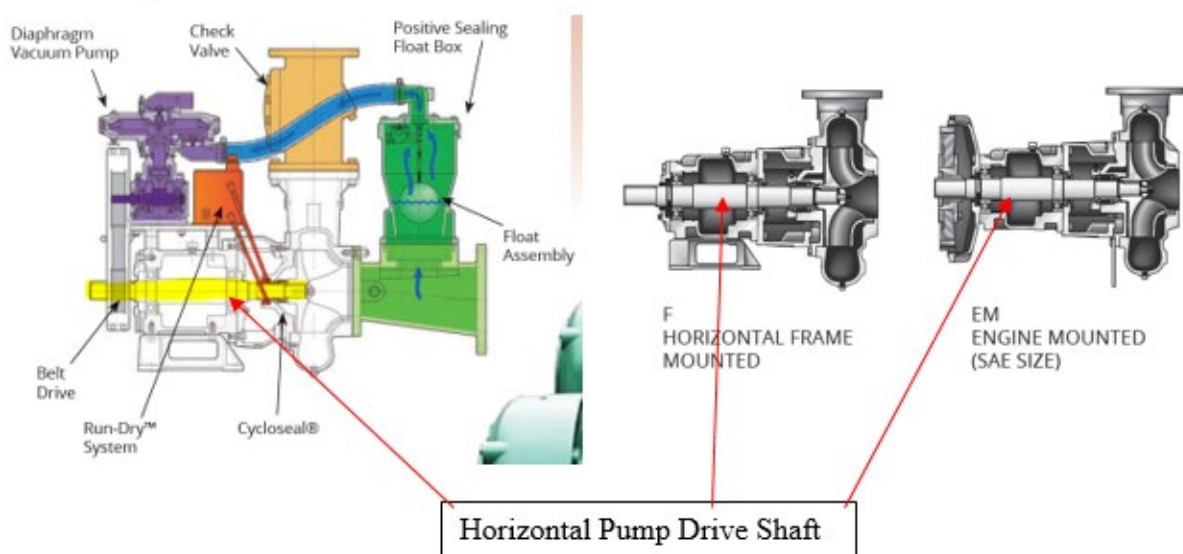
2. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST A LIQUID MANURE PUMP WITH A DRIVESHAFT THAT IS SUBSTANTIALLY VERTICAL AND HAS A CONSTANT ANGULAR ORIENTATION

352. The Puck Combination fails to teach or suggest the fixed orientation of the liquid manure pump recited in Substitute Claim 80, which requires the liquid manure pump with a driveshaft that is substantially vertical and has a constant angular orientation:

“the immersible liquid manure pump of the liquid manure mover including a drive shaft powering an impeller”

“where the drive shaft is substantially vertical [IV] and has a constant angular orientation relative to the floatable vehicle body”

353. As discussed above, Puck discloses an agitation boat including a slurry pump (38) that is illustrated on top of the boat hull at a location that is high above the surface of a manure lagoon. The slurry pump (38) in Puck is mechanically powered by a horizontal drive shaft and has a rear-facing fluid opening in the back of the pump housing.



EX1143 at 2, 7.

354. Puck does not teach or suggest the claimed arrangements where the liquid manure pump has a substantially vertical drive shaft.

355. Manure-Manager teaches a POSITA to locate a submersible manure pump at the lower end of an articulating boom arm that swings / pivots up and down:

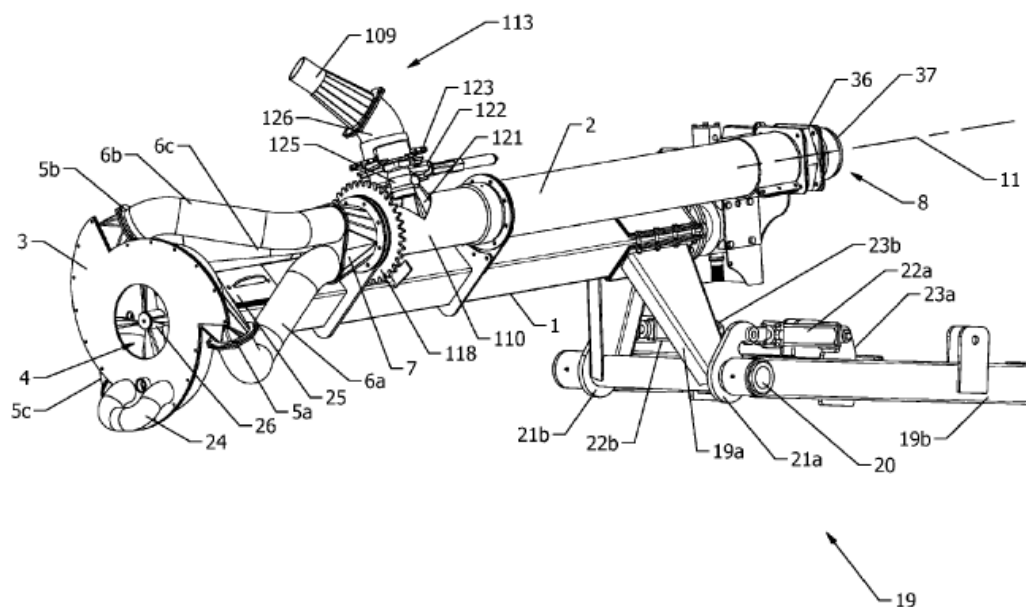


FIG. 1

EX2101, Fig. 1, p. 2.

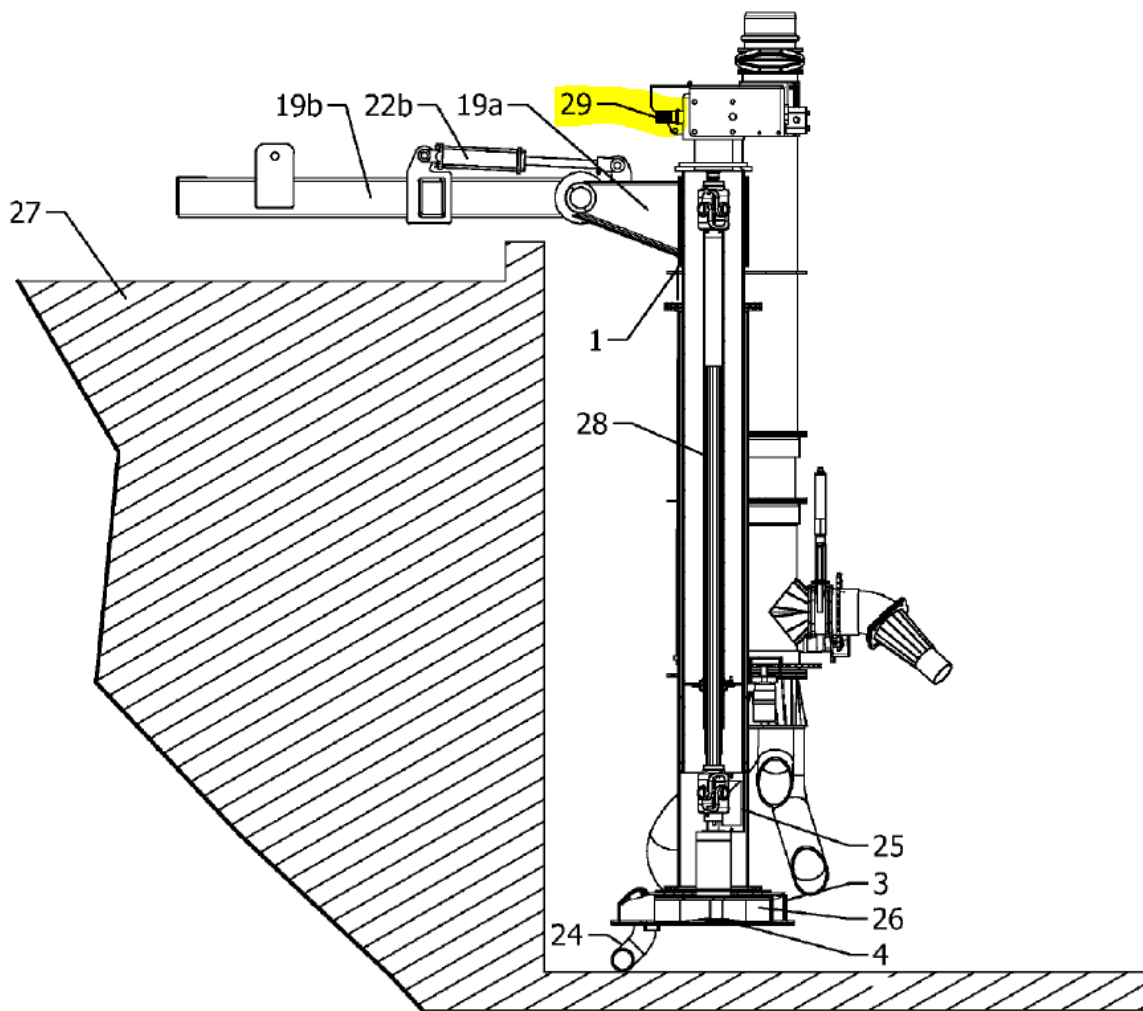


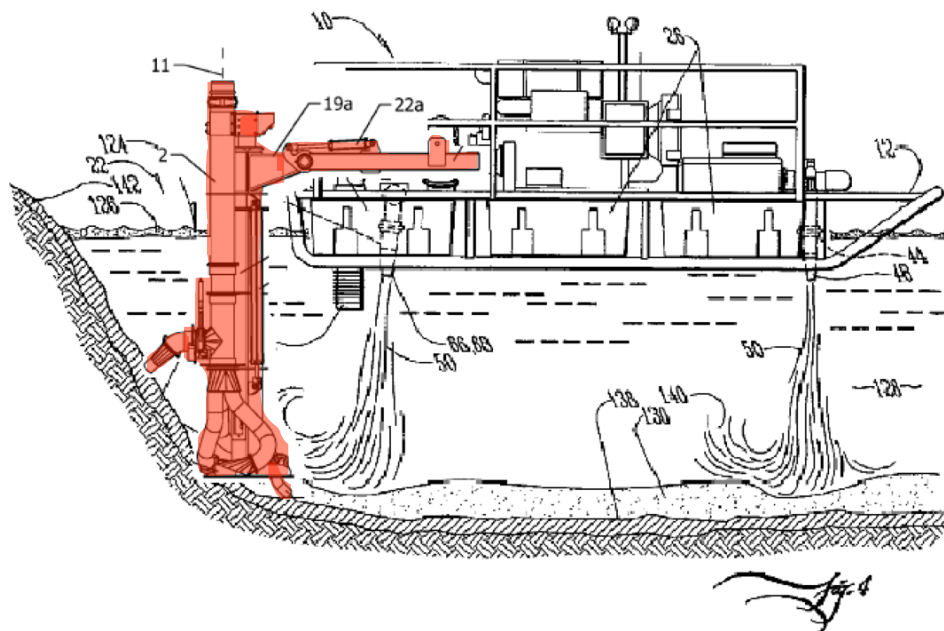
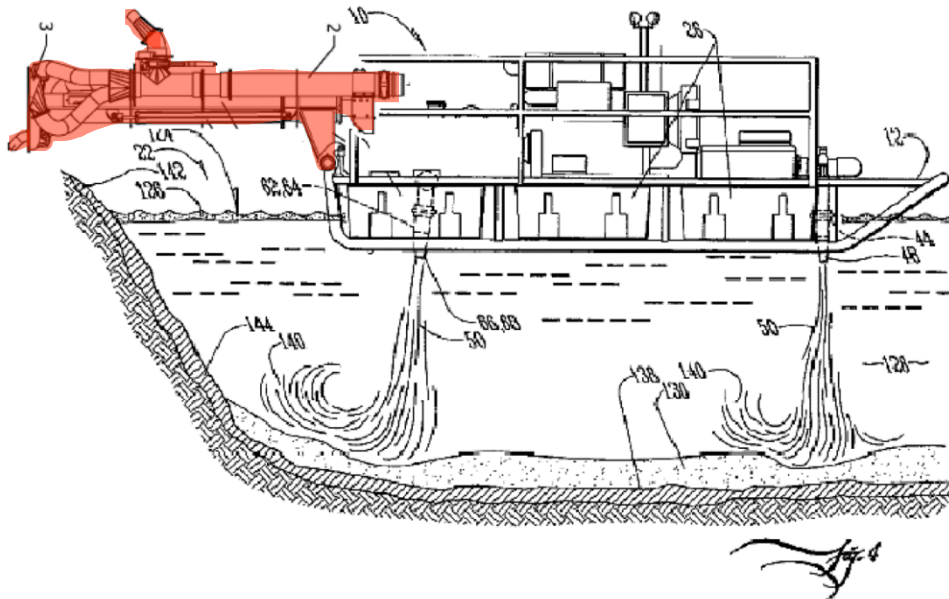
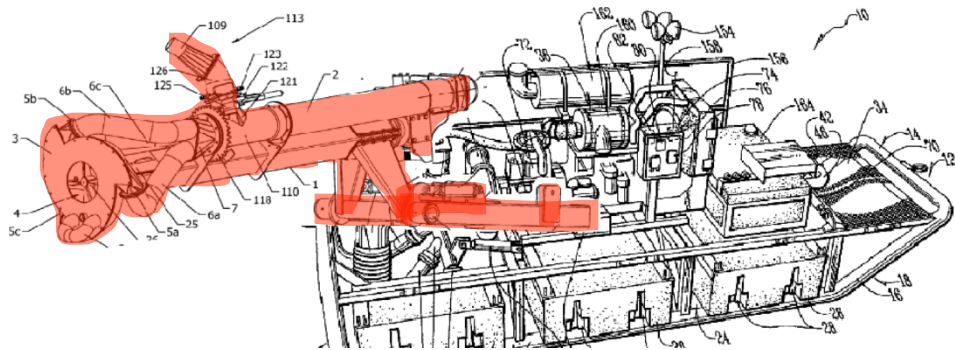
FIG. 2

EX2101, Fig. 2, p. 3.

356. A POSITA looking to the teachings Manure-Manager when attempting to design a manure lagoon agitation vehicle would logically attach the boom arm to the rear of Puck's deck in such a way that the boom arm could pivot so the lower end is immersed in the manure and the upper end can mate with a drive shaft to receive power. As will be shown below, what would have been logical to a POSITA is to attach the pivot of arm 19a to the rear crossbar 16, 20 in Puck so that Nuhn's Pit Pump could pivot up and down in a similar manner to the way it operates when attached to the rear hitch of a tractor and so that the PTO connector 29 on the upper end of the

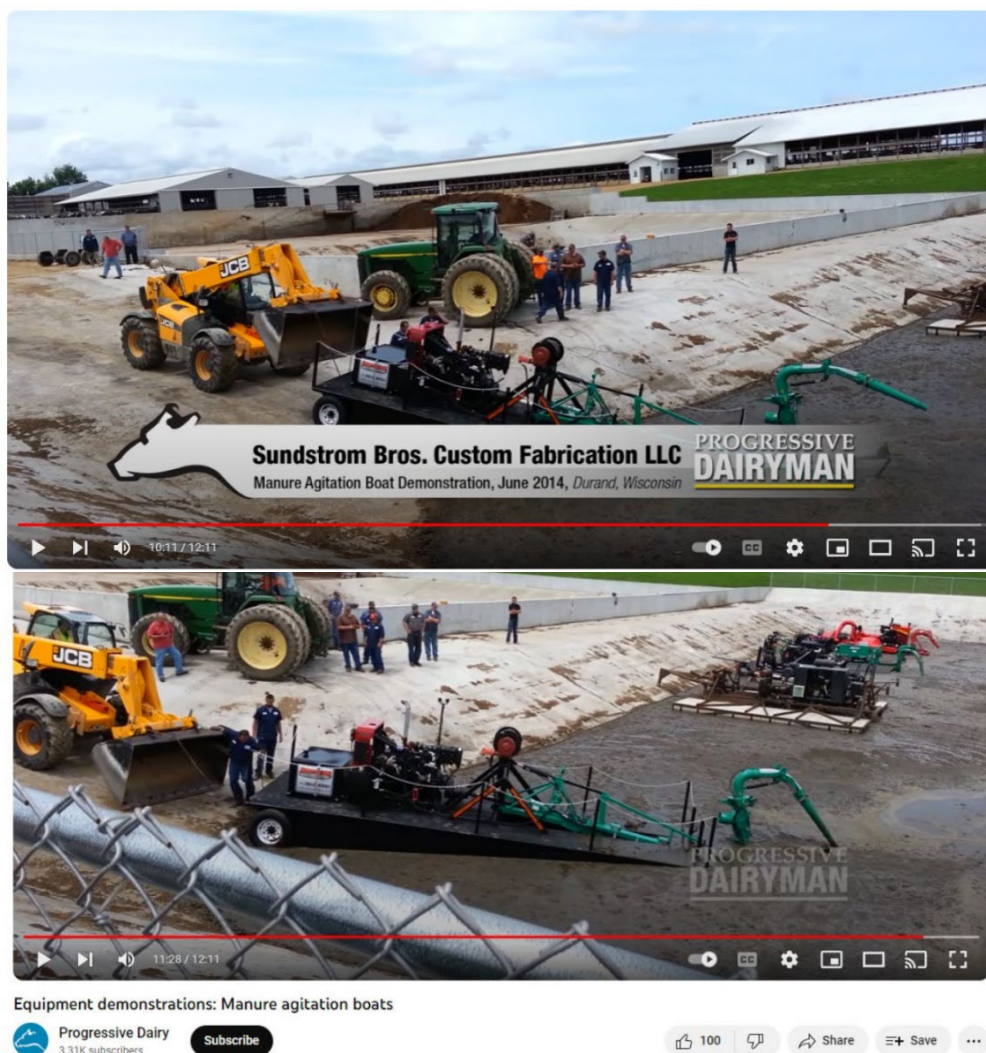
boom arm 1 of Nuhn's Pit Pump would be in near horizontal alignment with the crankshaft of Puck's power source.

357. If a POSITA were to make the Petitioner's combination where the pump 34 in Puck were replaced by Nuhn's Pit Pump, then the resulting combination would look like this:



358. My opinion regarding how a POSITA would go about adding Nuhn's Pit Pump to Puck, if they were so motivated, is not based on speculation (like Dr. Winkel's opinion), but rather is based on record evidence. In particular, I note that both Sundstrom (EX1153, EX1154, EX1156) and the Puck Prototype (EX1159) show other POSITAs' attempts at adding boom-mounted pumps to manure agitation boats/barges. In both cases, Sundstrom and Puck retained the boom arm, pivot structure, and pivot functionality of the pumps so that the boom-mounted pump could be tilted down and up into and out of the lagoon.

359. Sundstrom's floating manure agitator included a GEA Houle liquid manure pump mounted on the front end of a long boom arm. The boom arm extends forward at an angle that can be tilted up and down to a limited degree.

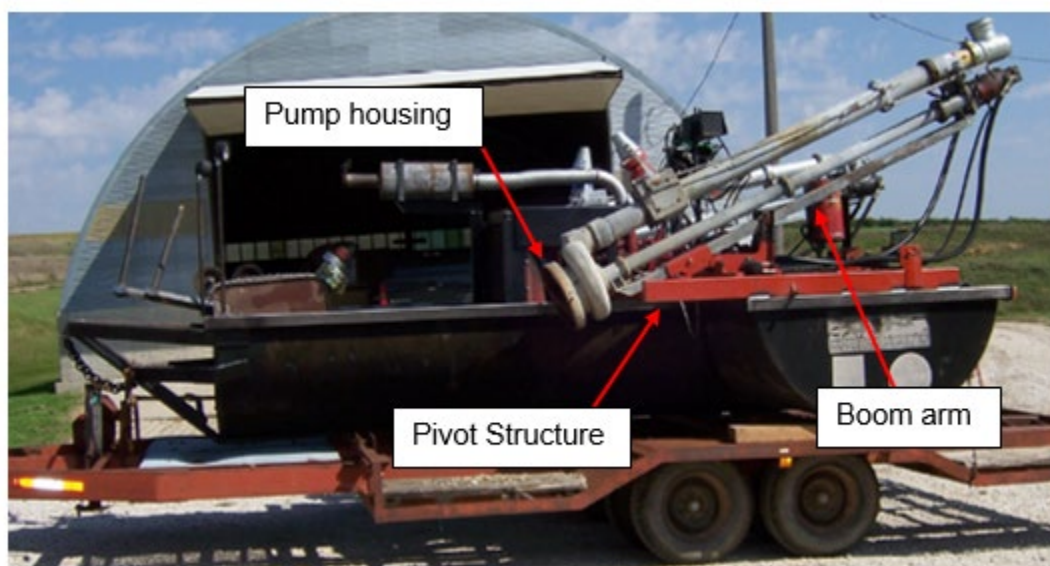


EX2008, 8-9.



EX1156, at 1.

360. The Puck Prototype included two submersible, boom-mounted pumps positioned on the right and left sides of the floating barge:



EX1159, p. 3.



EX1159, p. 5.

As shown in the photographs above, the submersible pumps are mounted on the far end of a boom arm that can tilt/swing up and down and be lowered into and out of the manure lagoon.

361. Both Sundstrom and the Puck Prototype reflect what other POSITAs in the art actually did during the same approximate time period (i.e., same decade) as Nuhn's invention. This evidence leads me to the conclusion that a POSITA would have mounted Nuhn's Pit Pump to Puck's boat with little modification, if they were motivated to make such a combination in the first place, and that they would have retained the long 10ft boom arm, pivot structure, and pivot functionality of Nuhn's Pit Pump because that is entirely consistent with what Sundstrom and Puck actually did.

362. On the other hand, this record evidence does not support Petitioner's combination, which does away with the pivot structure and pivot functionality of Nuhn's Pit Pump, and either significantly shortens the boom arm or does away with it completely. None of those modifications were made by Sundstrom or Puck, let alone vertically orienting a submersible manure pump in a constant angular orientation relative the floatable vehicle body.

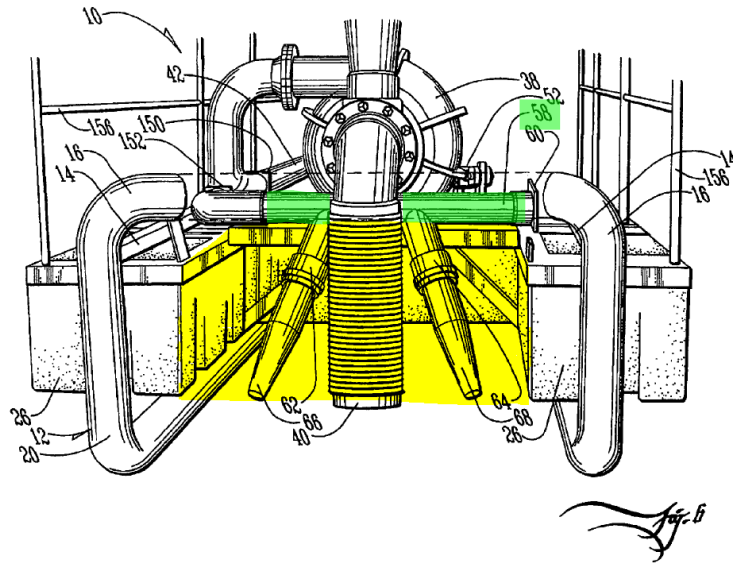
363. In view of the above analysis, if a POSITA were to add Nuhn’s Pit Pump to Puck’s boat, that combination would result in a pump at the far end of an articulating boom arm so that it could swing up and down in the same manner as when Nuhn’s Pit Pump is attached to a tractor. Thus, the combination of Manure-Manager and Puck would not result in a vehicle where the drive shaft of the liquid manure pump is substantially vertical and has a constant angular orientation relative to the floatable vehicle body” as required by Substitute Claim 80.

3. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST THE CLAIMED POSITION OF THE LIQUID MANURE PUMP, WHERE SUBMERGED COMPONENTS OF THE VEHICLE ARE POSITIONED DIRECTLY FORWARD OF AND DIRECTLY REARWARD OF THE PUMP HOUSING

364. The Puck Combination fails to teach or suggest the position of the pump housing of the liquid manure pump recited in Substitute Claim 80, which requires submerged components of the vehicle to be positioned directly forward of and directly rearward of the pump housing:

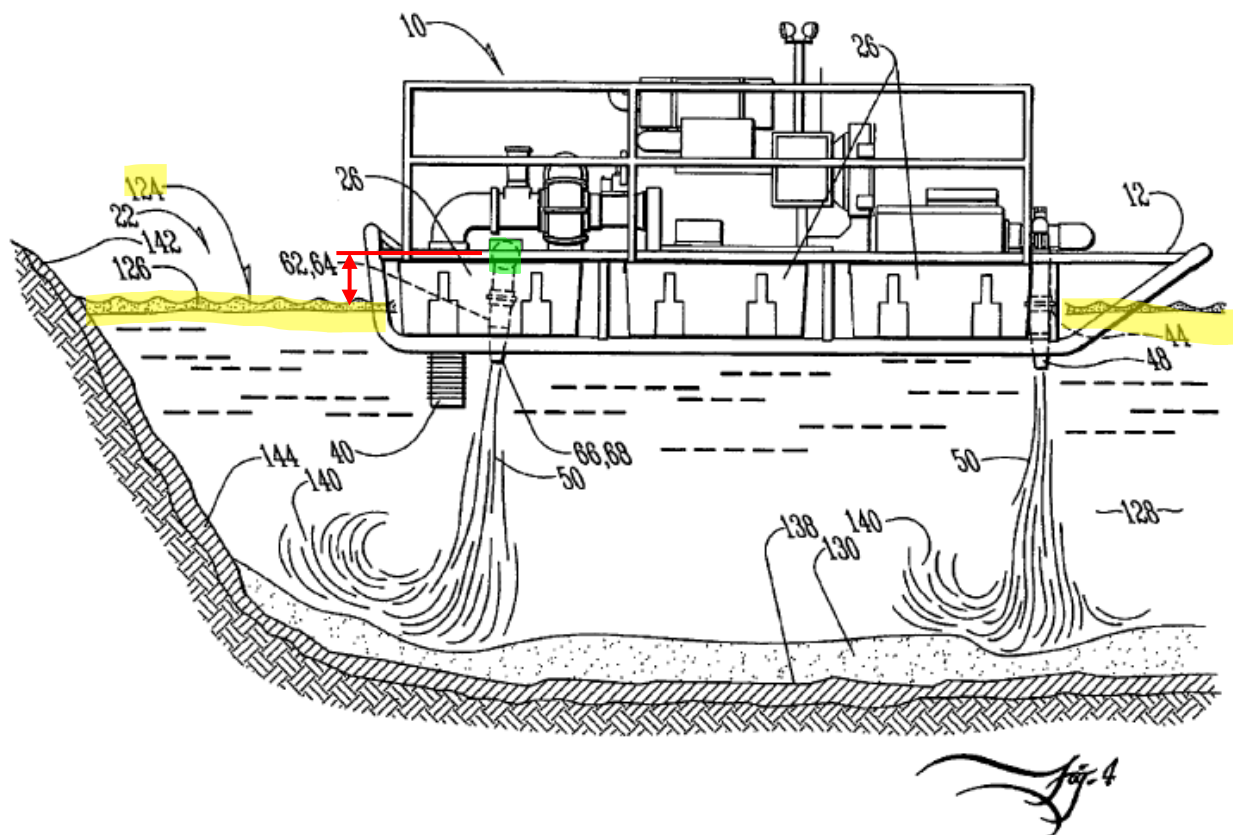
“wherein components of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to the right and left of the pump housing and are spaced from and positioned directly forward of and directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump”

365. The rear of Puck’s boat has a U-shaped cut-out between the floating dock sections (26) where the liquid manure intake pipe (40) is positioned, with a ninety-degree bend so that the intake pipe extends down into the manure lagoon.



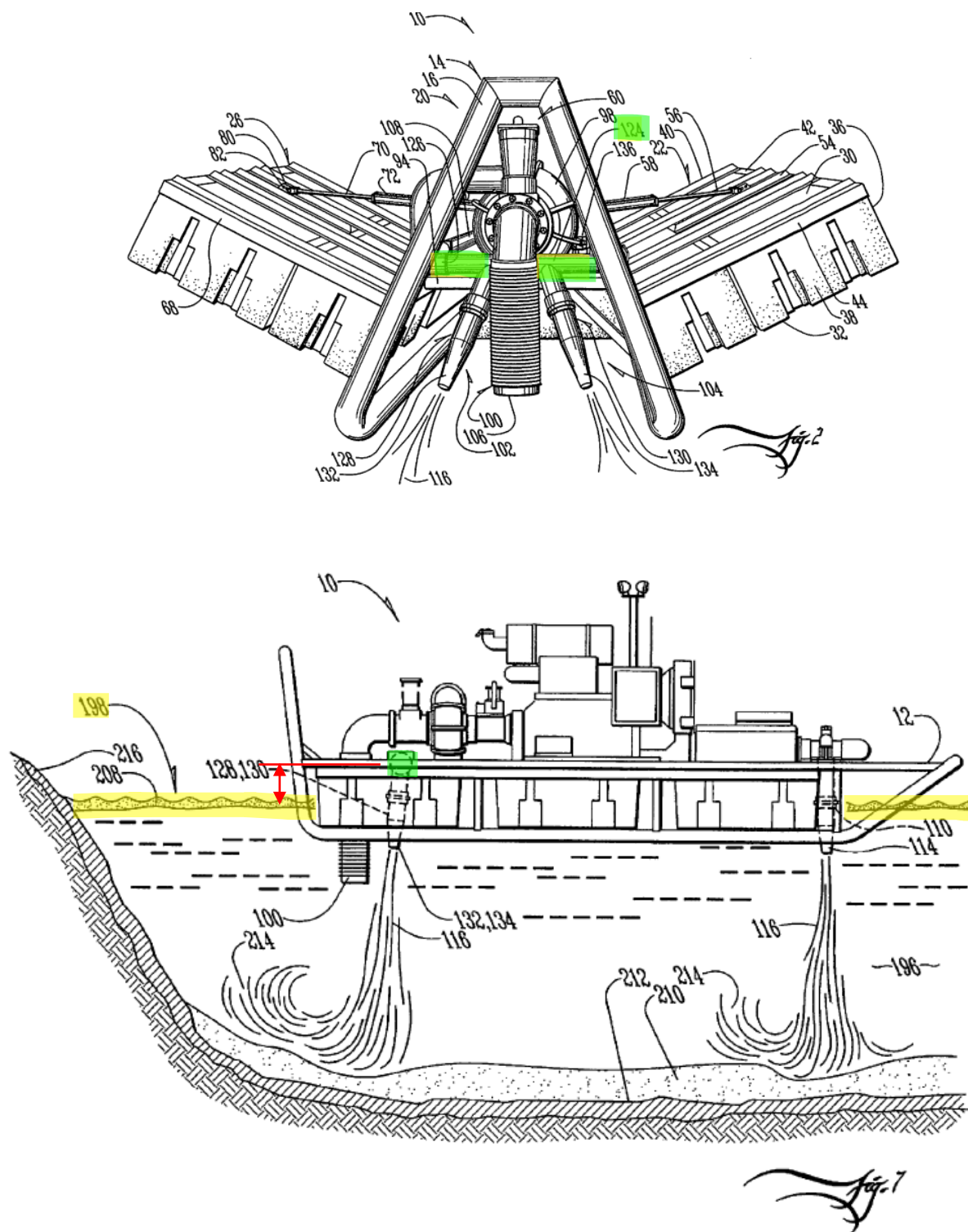
EX1014, Fig. 6, p. 7.

Even if a POSITA positioned Nuhn's Pit Pump in this space, as Petitioner suggests, there would be no submerged components that "are spaced from and positioned ... directly rearward of the pump housing along the longitudinal centerline of the floatable vehicle body to keep floating solid material away from the bottom fluid opening in the pump housing", as required by the language of the Substitute Claim 80. This is due to the fact that the rear nozzle yoke 58 disclosed in Puck is **forward** of the intake pipe 40 and is not a submerged component when the vehicle is floating because the rear nozzle yoke 58 is spaced **above** the top of the buoyant elements 26 and therefore is above the surface 124 of the manure lagoon.



EX1014, Fig. 4, p. 5.

366. The Puck Boat is the commercial embodiment of the vehicle described in U.S. Publication No. 2013/0145980 (EX2107, Puck II).

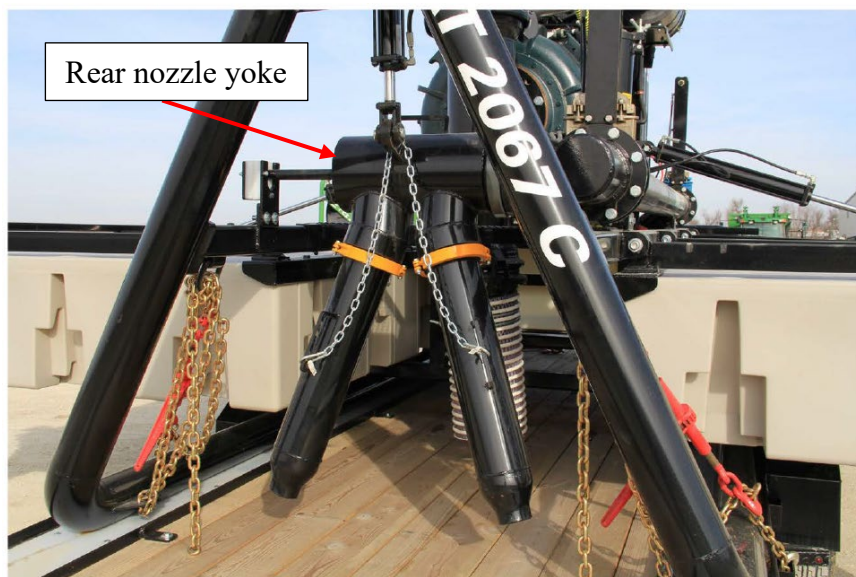


EX2107, Puck II, pp. 3 and 8 , FIGS. 2 and 7.

As shown above, in Puck II, the rear nozzle yolk 124 is also positioned **forward** of the downwardly directed intake pipe 100 and is spaced **above** the top of the buoyant elements 36 and therefore is

above the surface 198 of the manure lagoon.

367. Unlike in Puck II, where the rear nozzle yolk 124 is positioned forward of the downwardly directed intake pipe 100, the rear nozzle yolk on the Puck Boat (i.e., the commercial embodiment) is positioned behind the downwardly directed intake pipe near the rear “A” frame structure.



EX1164, p. 41.

368. As discussed above, Nuhn’s Pit Pump is designed to swing up and down, which is a feature that a POSITA would have retained. A POSITA therefore would have positioned the rear nozzle yolk forward of Nuhn’s Pit Pump (like in the configuration disclosed in Puck II) so that the rear nozzle yolk would not interfere with the pivoting pump. In my opinion, a POSITA would not have selected the alternative configuration used on the Puck Boat, where the rear nozzle yolk is rearward of the downwardly directed intake pipe, because a POSITA would have recognized that Nuhn’s Pit Pump would contact the rear nozzles and/or rear nozzle yolk when pivoted upward and to the rear of the boat for storage, transport, launching, and retrieval. This interference would have significantly limited the angle one could tilt Nuhn Pit Pump upward – a problem that would be avoided by selecting the position of the rear nozzle yolk disclosed in Puck II. As a result, a POSITA would have logically followed the teachings of Puck II’s rear nozzle

placement instead of the alternative location for the rear nozzles on Puck's Boat.

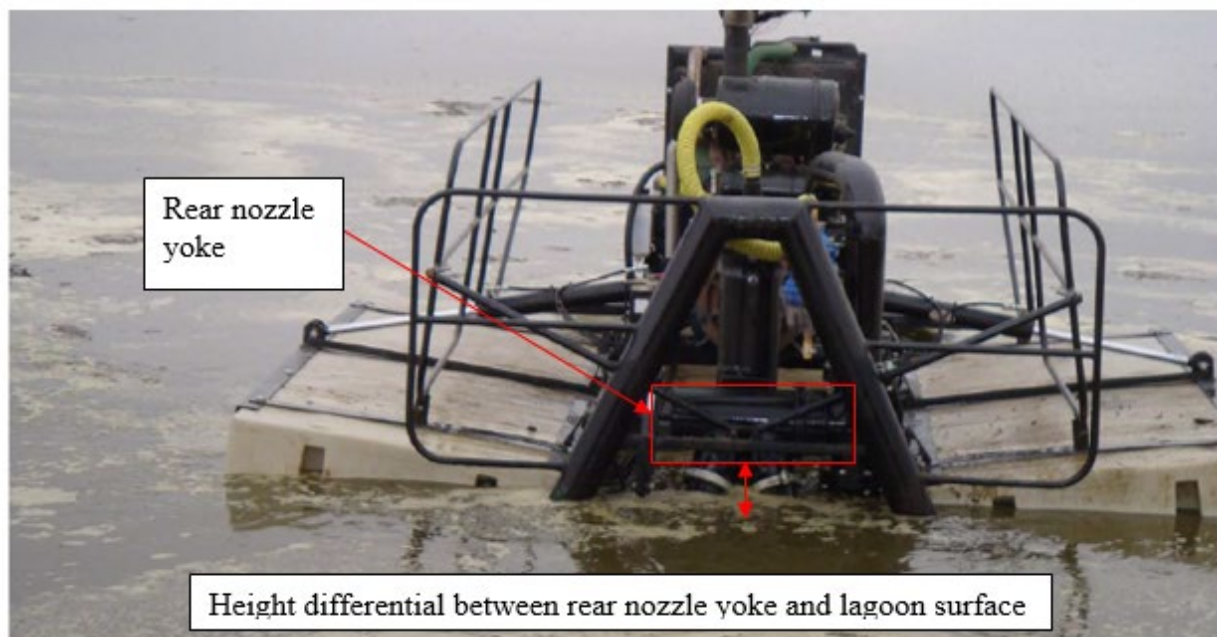
369. But even if a POSITA would have selected the placement of the rear nozzle yoke used on the Puck Boat (i.e., Puck's commercial embodiment), this is not a submerged component of the vehicle nor is it directly rearward of the pump housing as required by the language of Substitute Claim 80.

370. Like in Puck and Puck II, the rear nozzle yoke used on the Puck Boat is spaced above the top of the buoyant elements (i.e., the floats) by several inches.

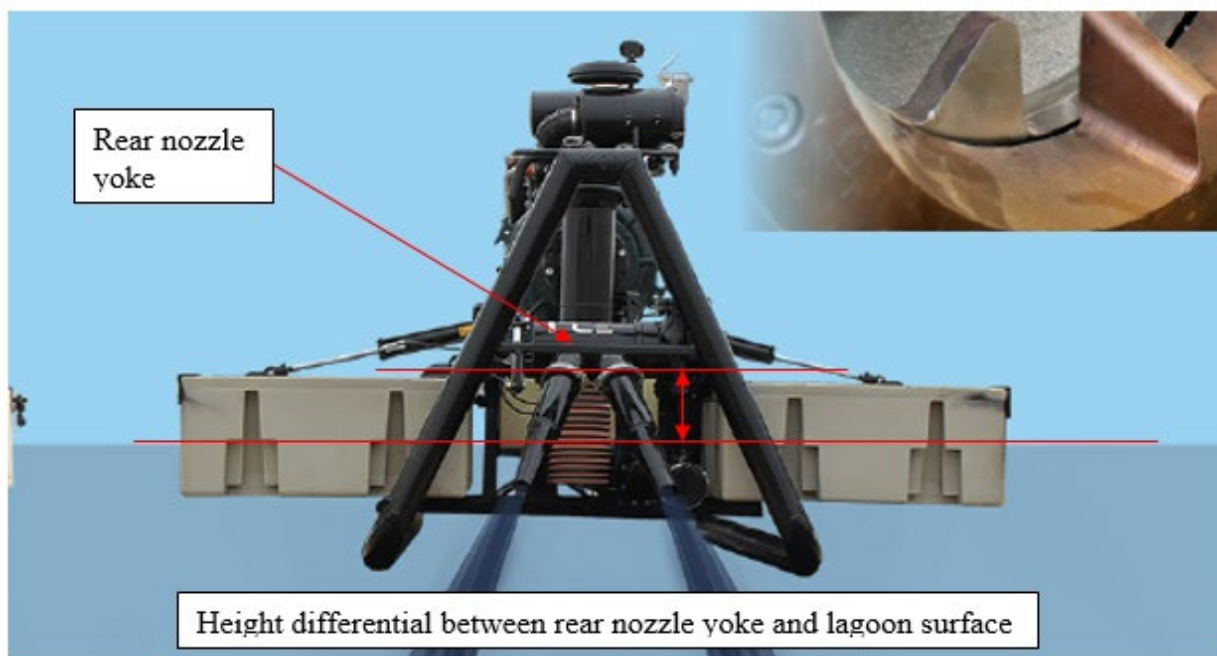


EX1164, p. 18.

371. The top of the buoyant elements (floats) are not submersed when the Puck Boat is floating so a POSITA would not understand the rear nozzle yoke to be a submerged component of the vehicle, as required by Substitute Claim 41.



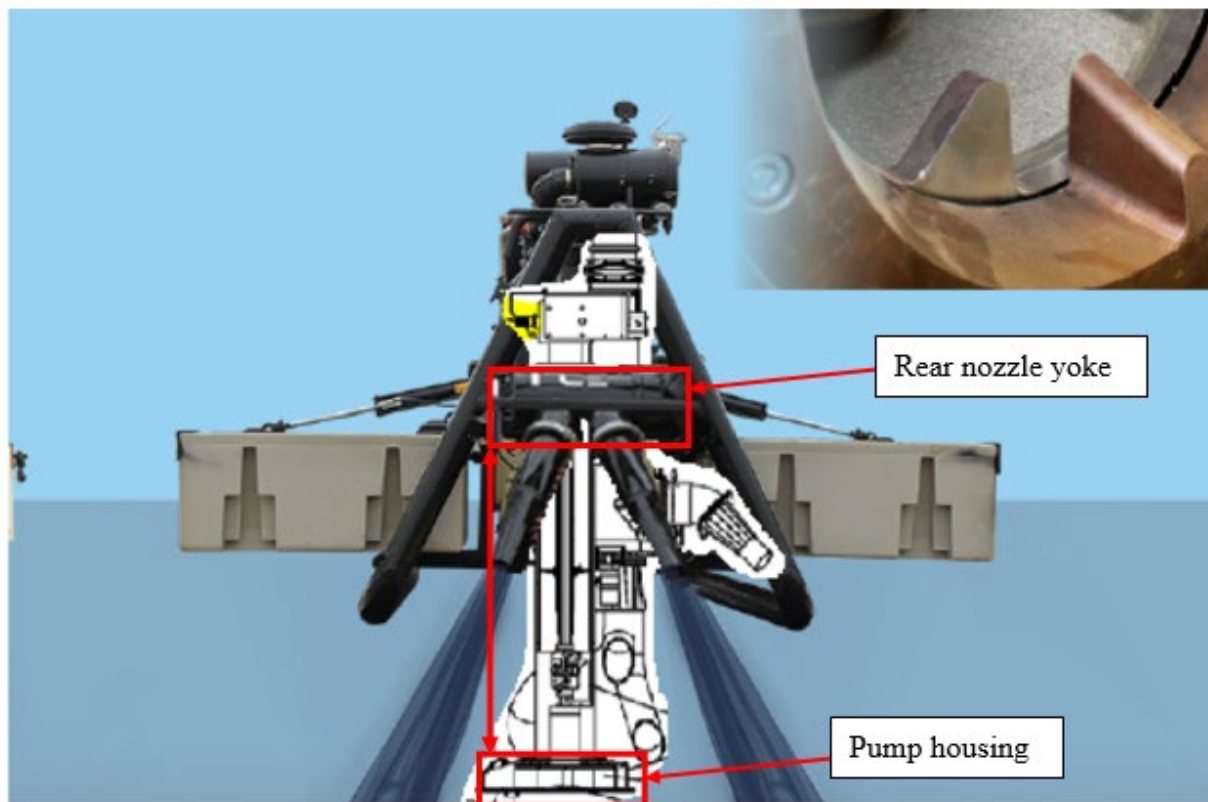
EX1169, p. 2.



EX1160, p. 2.

372. The photographs above demonstrate that the rear nozzle yoke of the Puck Boat cannot be fairly characterized as one of the “components of the vehicle that are submerged when the vehicle is floating”, as Substitute Claim 80 requires.

373. Nor would the rear nozzle yoke of the Puck Boat be positioned “directly rearward of the pumping housing” if the proposed combination were adopted. Dr. Winkel asserts that a POSITA would shorten Nuhn’s Pit Pump and place it in the location of Puck’s downwardly directed intake pipe. So the combination would look something like this:



EX1160, p. 2 (annotated).

A POSITA would not consider the rear nozzle yoke of the Puck Boat as being “directly rearward of the pump housing” due to the height differential between the components. Even if the pump housing were positioned along the bottom of the buoyant elements (floats), the rear nozzle yoke would be vertically spaced above the pump housing, rather than directly rearward of the pump housing, because the rear nozzle yoke is spaced above the top of the buoyant elements (floats).

374. A POSITA would understand the language of Substitute Claim 80 requiring a submerged component of the vehicle to be “directly rearward” of the pump housing as defining a three-dimensional geometric relationship where the submerged component of the vehicle must be

behind the pump housing and must be at substantially the same height (i.e., submerged depth) and substantially the same lateral position (i.e., not offset to the right or left) as the pump housing. This stands in contrast to the language of Substitute Claim 57, where the submerged component need only be “rearward of the pump housing along the longitudinal centerline,” which a POSITA would understand as defining a two-dimensional geometric relationship where the submerged component must be behind the pump housing and must have the same lateral position (i.e., not offset to the right or left) as the pump housing. In other words, because Substitute Claim 57 does not use to phrase “directly rearward”, it does not require the submerged component to be at substantially the same height/depth as the pump housing, it just needs to be submerged and positioned on the longitudinal centerline of the floatable vehicle body.

375. Thus, even if the boom arm of Nuhn’s Pit Pump were substantially shortened, as Petitioner argues (and shown above), the rear nozzle yoke of the Puck Boat would still be spaced well above the pump housing and there would be an **unobstructed** path to the pump housing from the rear (i.e., when viewed from the rear, the rear nozzle yoke would not obstruct from view any portion of the pump housing, which the claims define as the structure that houses the impeller.) A POSITA would not understand there to be a submerged component “directly rearward of the pump housing” in view of this unobstructed path/view to the pump housing from the rear of the boat.

376. Furthermore, as a result of this height differential and unobstructed path to the pump housing from the rear of the boat, the rear nozzle yoke would not be positioned to “keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump” as Substitute Claim 80 requires.

377. In view of the above analysis, if a POSITA were to add Nuhn’s Pit Pump to Puck and adopt the location of the rear nozzle yoke used on the Puck Boat (i.e. the commercial embodiment), the combination would still fall short of the configuration recited in Substitute Claim 80, where “components of the vehicle that are submerged when the vehicle is floating are spaced from and positioned to the right and left of the pump housing and are spaced from and positioned

directly forward of and directly rearward of the pump housing to keep floating solid material away from the bottom fluid opening in the pump housing of the immersible liquid manure pump” as required by Substitute Claim 80.

378. I also disagree with Dr. Winkel’s alternative argument that a POSITA would add a floating dock section (i.e., buoyant element) behind the pump housing of Nuhn’s Pit Pump. This argument is entirely hindsight bias, as it is not taught or suggested by any prior art reference or other record evidence.

**4. THE PUCK COMBINATION FAILS TO DISCLOSE OR SUGGEST A
“HYDRAULICALLY POWERED LIQUID MANURE MOVER” AND A
“POWER SOURCE CONFIGURED TO PROVIDE POWER TO BOTH THE
GROUND ENGAGING PROPULSION STRUCTURE AND THE LIQUID
MANURE MOVER”**

379. Neither Puck, the Puck Boat, Bryham, or Manure-Manager disclose “a hydraulically powered liquid manure mover” and “a power source that provides power to both the ground engaging propulsion structure and the liquid manure mover” as required by the language of Substitute Claim 80.

380. The manure pumps in Puck and the Puck Boat are mechanically powered as is Nuhn’s Pit Pump.

381. With respect to the hydraulic system, Puck discloses a hydraulic pump 54 that is powered by a 12-volt battery 56. EX1014, Para. [0027]. A POSITA would have recognized that such a system would not be capable of powering any manure pump, let alone Nuhn’s Pit Pump, which requires a minimum of 95 horsepower. EX2115, p. 2. As a result, a POSITA would have installed Nuhn’s Pit Pump such that its input shaft could be coupled to and mechanically powered by Puck’s engine, if they were motivated to make the combination in the first place.

382. Dr. Winkel attempts to correct this by now making the unsupported argument that Bryham’s hydraulic system could somehow be used to power both the ground engaging wheels and Nuhn’s Pit Pump. EX1174, ¶59. But Dr. Winkel has not shown that a POSITA would expect

Bryham’s hydraulic system to be capable of powering Nuhn’s Pit Pump. The record suggests that it would not.

383. Maurice Bryham testified in his deposition that the optional firefighting pump they used in some of their vehicles was powered by a secondary inboard engine with an effective output of 24 horsepower. EX1176, pp. 111, 117. A POSITA would not reasonably expect Bryham’s secondary inboard engine and hydraulic system to be capable of powering Nuhn’s Pit Pump when Bryham’s system had an output of about 24 horsepower and Nuhn’s Pit Pump had a minimum of 95 horsepower.

384. In view of the above analysis, if a POSITA were to add Nuhn’s Pit Pump to Puck, they would have mechanically driven Nuhn’s Pit Pump by coupling the input drive shaft on Nuhn’s Pit Pump to the output shaft of Puck’s motor. Thus, the result of this combination would not have been a hydraulically powered liquid manure mover where “a power source that provides power to both the ground engaging propulsion structure and the liquid manure mover” as required by the language of Substitute Claim 80.

5. THE PUCK COMBINATION FAILS TO DISCLOSE “WIRELESS REMOTE CONTROL CONFIGURED TO ... (1) CONTROL THE GROUND ENGAGING PROPULSION STRUCTURE”

385. Puck’s remote-control system is limited to turning the engine on and off, controlling engine speed, turning the nozzles on and off, and controlling nozzle direction. *See* EX1014, Puck, ¶¶ [0032]-[0033]. Puck also lacks any sort of ground engaging propulsion structure. As a result, Puck’s remote-control system does not provide “wireless remote control configured to enable an operator who is remote from the vehicle to ... (1) control the ground engaging propulsion structure” as required by the language of Claim 80. And Bryham lacks any discussion of remote control and therefore fails to supply this element missing from Puck.

386. Dr. Winkel argues that a POSITA would have been motivated to configure the remote-control steering system of Puck (used while the boat of Puck is floating) to control the

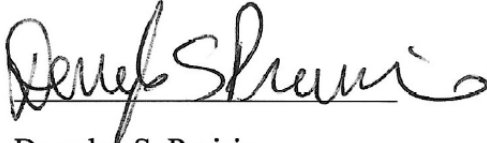
speed and direction of Bryham's wheels while the vehicle is ground engaging. EX1004, Winkel Decl., ¶¶349-350. But this argument fails to address whether a POSITA would have a reasonable expectation that Puck's remote-control system for controlling movement while floating in the manure lagoon could be successfully modified and used for control over Bryham's steering and propulsion system (i.e., Bryham's wheels) while Puck's boat is on the ground. Again, POSITA would understand that just because *some* vehicles can be remote controlled does not mean that *all* vehicles can be remote controlled.

XII. CONCLUSION

387. Based on my analysis, it is my opinion that the cited art does not anticipate or render obvious any of the Substitute Claims (Claims 41-80) presented in Patent Owner's Revised Motion to Amend the '835 Patent.

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

Dated: January 13, 2025



Douglas S. Prairie