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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. IPR2023-01161

Patent No. 11,358,425

DECLARATION OF DOUGLAS S. PRAIRIE IN SUPPORT OF PATENT OWNER'S RESPONSE

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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. 11,358,425 ("the '425 Patent"). I have been asked to consider whether certain references disclose or suggest the features recited in at least Claim 1 of the '425 Patent, which is the sole independent claim. My opinions are set forth below. I understand that Petitioner has challenged Claims 1-21 of the '425 Patent ("the Challenged Claims") and that I may be asked to provide my opinions on dependent Claims 2-21 at a later date.

2. 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

3. 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.

4. 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

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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.

5. 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.

6. 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.

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7. 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.

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

9. 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.

10. 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.

11. 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.

12. 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

13. 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.

14. In reaching the opinions and conclusions discussed herein, I reviewed, considered,

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and/or relied upon the following materials:

Exhibit #	*Description*
--	Bazooka-Farmstar, LLC's Petition for IPR2023-01161
1001	U.S. Patent No. 11,358,425 ("the '425 Patent")
1002	Prosecution History of U.S. Patent No. 11,358,425
1003	Curriculum Vitae of Eric Winkel
1004	Declaration of Eric Winkel, dated June 29, 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")
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	Ron Lyseng, Float your boat in a slurry moat, THE WESTERN PRODUCER, dated August 29, 2013 ("Lyseng")
1020	U.S. Patent No. 7,478,817 ("Carrier-II")
1021	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (2013) ("Truxor-II")
1022	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (2013)

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	("Truxor-III")
1023	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER ("Truxor-IV")
1024	Russian Patent Application No. 2012137830/11 ("Melnikov")
1025	English Translation of Melnikov (EX1024) and Declaration of Samuel Goldfarb, dated June 7, 2023
1026	Johanna Kaschik, Der Frosch als Vorbild, HNA (August 25, 2011), https://www.hna.de/lokales/rotenburg-bebra/frosch-vorbild-1376974.html
1027	English Translation of Der Frosch als Vorbild (EX1026) and Declaration of Beverly Santamaria, dated June 8, 2023
1028	Screenshots from UD Umwelt-Dienste GmbH Amphi-King Manure Pumping Video
1029	U.S. Patent No. 8,944,758 ("the '758 Patent")
1030	U.S. Provisional Patent Application No. 61/867,598 ("the '598 Provisional")
1031	International Publication of PCT Application No. PCT/CA2014/050,789 ("the '789 PCT")
1032	Notification of the International Application Number and International Filing Date of PCT Application No. PCT/CA2014/050,789
1033	Excerpts of Prosecution History of U.S. Patent No. 9,694,636
1034	Excerpts of Prosecution History of U.S. Patent No. 10,124,638
1035	Excerpts of Prosecution History of U.S. Patent No. 10,710,422
1036	Excerpts of Prosecution History of U.S. Patent No. 10,974,557
1037	Excerpts of Reexamination History of U.S. Patent No. 10,974,557
1038	Excerpts of Reexamination History of U.S. Patent No. 11,358,425
1039	Stipulation Regarding Invalidity Contentions Filed in the '015 Litigation
1040	NE. REG'L AGRIC. ENG'G SERV., LIQUID MANURE APPLICATION SYSTEMS DESIGN MANUAL (1998)
1041	DONALD L. PFOST & CHARLES D. FULHAGE, U. MO. EXTENSION, LAND APPLICATION EQUIPMENT FOR LIVESTOCK AND POULTRY MANURE MANAGEMENT (2001) ("Pfost I")
1042	DONALD L. PFOST & CHARLES D. FULHAGE, U. MO. EXTENSION, BEEF MANURE MANAGEMENT SYSTEMS IN MISSOURI (2000) ("Pfost II")
1043	William F. Wright, *Dairy Manure Particle Size Distribution, Properties, and Implications for Manure Handling and Treatment, in* 2005 ASAE ANN. INT'L MEETING (2005) ("Wright")

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1044	EFFECTS OF LIQUID VISCOSITY ON ROTODYNAMIC (CENTRIFUGAL AND VERTICAL) PUMP PERFORMANCE (AM. NAT'L STANDARDS INST. 2010) ("ANSI Viscosity")
1045	Ole Thygesen et al., *Indicators of Physical Properties and Plant Nutrient Content of Animal Slurry and Separated Slurry*, 5(3) BIOLOGICAL ENG'G TRANSACTIONS 123 (2012)
1046	Randy L. Beaver, William E. Field, *Summary of Documented Fatalities in Livestock Manure Storage and handling Facilities—1975-2004*, 12 J. AGROMEDICINE 3 (2007)
1047	ROBBIN MARKS, NAT'L RES. DEF. COUNCIL AND THE CLEAN WATER NETWORK, CESSPOOLS OF SHAME (2001)
1048	Dwight D. Bowman & Jeffrey C. Burnham, *Manure Pathogens: Real Issues and Real Risks, in* PROCEEDINGS OF THE WATER ENV'T FED'N 694 (2000)
1049	U.S. Ctr. for Disease Control, *Fatalities Attributed to Entering Manure Waste Pits -- Minnesota, 1992*, 42 MORBIDITY & MORTALITY WKLY REP. 325 (1993)
1050	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)
1051	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)
1052	SIDUO ZHANG, NAT'L COLLABORATING CTR. FOR ENV'T HEALTH, AIR QUALITY AND COMMUNITY HEALTH IMPACT OF ANIMAL MANURE MANAGEMENT (2011)
1053	MANURE STORAGE SAFETY ASAE EP470 JAN1992 (AM. SOC'Y OF AGRIC. AND BIOLOGICAL ENG'GS 2005)
1054	MIDWEST PLAN SERV., LIVESTOCK WASTE FACILITIES HANDBOOK (3d ed. 1993)
1055	C.A. Loto & A.P.I Popoola, *Environmental Surface Degradation of Galvanised and Mild Steels in Cattle and Poultry Wastes and Urea Solution*, 6(13) INT'L J. PHYS. SCI. 3074-81 (2011)
1056	L.M. Safley, Jr. & P.W. Westerman, *Corrosion of Galvanized Steel in Animal Waste Environments*, 40 BIORESOURCE TECH. 53 (1992)
1057	FRANK YEAPLE, FLUID POWER DESIGN HANDBOOK (3d ed. 1995)
1058	Charles D. Fulhage, *Solids Removal from Livestock Manure Lagoons*, U. MO. EXTENSION (Nov. 1995), https://extension.missouri.edu/publications/wq324
1059	U.S. Patent No. 613,809

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1060	ED ODGERS ET AL., MANURE GAS SAFETY: REVIEW OF PRACTICES AND RECOMMENDATIONS FOR WISCONSIN LIVESTOCK FARMS (2008)
1061	U.K. Patent App. No. 2,366,218
1062	U.S. DEP'T AGRIC., *Agricultural Waste Characteristics, in* AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 4 (2008)
1063	U.S. DEP'T AGRIC., *Agricultural Waste Management System Component Design, in* AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 10 (2009)
1064	U.S. DEP'T AGRIC., *Waste Utilization, in* AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 11 (2013)
1065	U.S. DEP'T AGRIC., *Waste Utilization, in* AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 11 (1996)
1066	U.S. DEP'T AGRIC., *Waste Management Equipment, in* AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 12 (2011)
1067	U.S. DEP'T AGRIC., *Operation, Maintenance, and Safety, in* AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 13 (2011)
2001	Petitioner's *Ex Parte* Reexamination Requests for U.S. Patent No. 11,358,425 and U.S. Patent No. 10,974,557
2002	Decision Granting Patent Owner's Petition for an Unintentionally Delayed Priority Claim in U.S. Patent. No. 10,124,638
2003	U.S. Patent No. 4,594,006 to Depeault ("Depeault")
2004	Expert Declaration of Douglas S. Prairie (cited here for completeness)
2005	Curriculum Vitae of Douglas S. Prairie and Case List (cited here for completeness)
2006	Screenshots from Patent Owner's YouTube Channel of Patented Product, retrieved on 10-2-23 from https://www.youtube.com/watch?v=fEgvvq9HZkk
2007	Screenshots from Petitioner's YouTube Channel of Accused Product, retrieved on 10-2-23 from https://www.youtube.com/watch?v=3y3bSJJUOps
2008	Screenshots from Progressive Dairyman YouTube Channel of 2014 Manure Lagoon Agitation Boat Demonstration, published on 7-9-14 by Progressive Dairy, retrieved on 10-2-23 from https://www.youtube.com/watch?v=FXRS-9Ip1pE
2009	Patent Classification List for U.S. Patent No. 11,358,425, retrieved on 10-4-23 from https://patents.google.com/patent/US11358425B1/en?oq=US11358425
2010	U.S. Patent No. 4,406,413 to Houle ("Houle")
2011	U.S. Patent No. 7,833,071 to Gaither ("Gaither")
2012	U.S. Patent No. 5,176,098 to Royle ("Royle")
2013	U.S. Patent No. 9,462,741 to Puck ("Puck-II")

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2014	U.S. Patent No. 9,572,297 to Puck ("Puck-III")
2015	DE2364962 to Kronseder ("Kronseder")
2016	DE3431345 to Lüllmann ("Lüllmann")
2017	CA2002619 to Depault ("Depault-II")
2018	U.S. Patent No. 10,118,138 to Tews ("Tews")
2019	DANIEL L. PFOST ET AL., UNIV. OF MO. EXTENSION, ANAEROBIC LAGOONS FOR STORAGE/TREATMENT OF LIVESTOCK MANURE (Oct. 2000)
2020	Screenshots from 2023 North American Manure Expo Website, retrieved on 10-2-23 from https://www.manureexpo.ca/
2021	Dictionary Definitions of "Dredging" and "Agitation", retrieved on 9-30-23 from https://en.wikipedia.org/wiki/Dredging, https://www.merriam-webster.com/dictionary/dredging#dictionary-entry-1, https://www.merriam-webster.com/dictionary/agitation, and https://www.lagoonpumping.com/articles-resources/agriculture-articles/manure-articles/
2022	ENVTL. PROT. AGENCY, PRIMER FOR MUNICIPAL WASTEWATER TREATMENT SYSTEMS (Sept. 2004)
2023	U.S. DEP'T AGRIC., *Agricultural Waste Management Systems, in* AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK ch. 9 (Dec. 2011)
2024	Screenshot of 2023 Commercial Manure Applicator Certification, retrieved on 10-3-23 from https://elearning-dnr.iowa.gov/course/index.php?categoryid=2
2025	JOSEPH AKYEAMPONG ET AL., *Evaluation of hydraulic excavator Human-Machine Interface concepts using NASA TLX*, 44 INT'L J. OF INDUS. ERGONOMICS 374, 374–82 (2014)
2026	Screenshots of 2023 Truxor Website, retrieved on 10-1-23 from https://truxor.com/en/catalog/node/products and https://truxor.com/en/catalog/node/products-truxor-machines
2027	Screenshots of 2023 Berky (formerly SenwaTec) Website, retrieved on 10-4-23 from https://www.berky.de/en/berky-nereus-240-amphi/
2028	CHRISTIAN HAAS ET AL., *Practical Evaluation of a Control Concept for a Remote Controlled 1.8T Excavator Using a 3D Input Device*, BATH/ASME 2022 Symposium on Fluid Power and Motion Control, ISBN: 978-0-7918-8633-5, FPMC2022-88959, V001T01A012-1 thru V001T01A012-7 (2022)
Paper 12	Decision Granting Institution of Inter Partes Review (IPR2023-01161) (the "Institution Decision")
2030	K. Smith et al., *Natural Crusting Of Slurry Storage As An Abatement Measure For Ammonia Emissions On Dairy Farms*, 97 Biosystems Engineering 464 (2007)

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2031	Printout of Bazooka's webpage for its Wolverine Agitation Boat at: https://www.bazookafarmstar.com/equipment/wolverine-agitation-boat/
2032	Bazooka's brochure for the Bazooka Wolverine Agitation Boat from: https://www.bazookafarmstar.com/wp-content/uploads/2023/01/Cutsheet-Wolverine-1.pdf.
2033	H. Landry et al., *Physical and Rheological Properties of Manure Products*, APPLIED ENGINEERING IN AGRICULTURE, at 278 (2004)
2034	*Hydrostatic Pto's Run in Reverse*, FARM SHOW, Vol. 1 No. 5, 1977
2035	Brochure for MY2017 of Nuhn's Gen 1 Lagoon Crawler
2036	Operator's/Safety Manual for the MY2017 of Nuhn's Gen 1 Lagoon Crawler
2037	Parts Catalog for Nuhn's Gen 1 Lagoon Crawler
2038	Brochure for Nuhn's Gen 1 Lagoon Crawler
2039	Brochure for MY2018 of Nuhn's Gen 2 Lagoon Crawler
2040	Operator's/Safety Manual for the MY2019 of Nuhn's Gen 2 Lagoon Crawler
2041	Parts Book for the MY2018 of Nuhn's Gen 2 Lagoon Crawler
2042	Brochure for Gen 2 Lagoon Crawler
2043	Brochure for MY2022 of Nuhn's Gen 3 Lagoon Crawler
2044	Operator's/Safety Manual for the MY2020 of Nuhn's Gen 3 Lagoon Crawler
2045	Parts catalog for the MY2021 of Nuhn's Gen 3 Lagoon Crawler
2046	Brochure for Nuhn's Crawler X
2047	Parts Catalog for the MY2022 of Nuhn's Crawler X
2048	U.S. Provisional Patent Application No. 63/040,562 filed June 18, 2020
2049	U.S. Provisional Patent Application No. 63/104,887 filed October 23, 2020
2050	U.S. Patent Application Publication US 2021/0394571 published December 23, 2021
Claims Appendix to Motion to Amend	Substitute Claims 22-42
2081	U.S. Provisional Application No. 61/867,598 (filed August 19, 2013).
2082	US3384047 to Royle
2084	US20100144220A1 to Bailey
2087	Curriculum Vitae of Douglas S. Prairie and Case List – updated April 2, 2024 (cited here for completeness)

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15. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art, as defined below, would have understood the claims and the specification of the '425 Patent at the time of the alleged invention.

16. As I discuss in detail below, it is my opinion that the prior art cited by Petitioner fails to disclose or render obvious the Challenged Claims, including at least independent Claim 1 of the '425 Patent. In particular, it is my opinion that Petitioner has not demonstrated that the following Grounds render the Challenged Claims unpatentable:

- Ground 1 – Anticipation of Claims 1-21 by Carrier
- Ground 2 – Obviousness of Claims 1-7 and 12-19 by Truxor in view of Yoon or Carrier
- Ground 3 – Obviousness of Claims 1-7 and 12-19 by SenwaTec in view of Yoon or Carrier
- Ground 4 – Obviousness of Claims 1-21 by Puck in view of Bryham
- Ground 5 – Obviousness of Claims 1-21 by Puck in view of Bryham and Bennett-II
- Ground 6 – Anticipation of Claims 1-21 by Lyseng

IV. BACKGROUND ON FARM LAGOONS, MANURE AGITATION, AND SPREADING

17. This section describes the general operating environment described in the '425 Patent – farm lagoons and pits (i.e., manure lagoons).

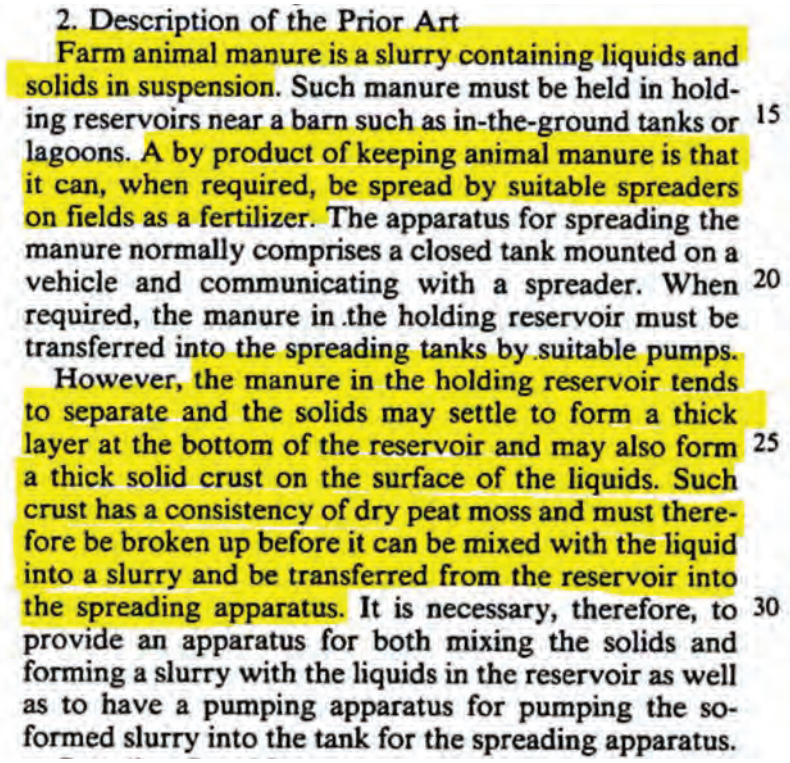
18. It is common practice in livestock farming to wash animal manure into a pit or lagoon (hereafter "manure lagoon"). The manure stored in these manure lagoons is pumped out at regular intervals and applied as fertilizer to fields. During storage, the manure in a manure lagoon stratifies into layers, which often includes a hard crust on the surface. As a result, the manure in manure lagoons needs to be agitated from time to time, including before pump-out.

19. The most economic and common construction method for a manure lagoon involves creating a rectangular shaped earthen type of pond structure. This structure usually has steep side walls with bank slopes from 2:1 to 3:1 [EX2019, p. 4] and sometimes will have a

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shallower concrete apron for machinery access. The manure lagoon needs to be constructed such that the sides and bottom are sufficiently impermeable to protect groundwater. EX2019, p. 4. Methods and materials to provide this barrier will vary by geographic location and soil type. The magnitude of these manure lagoons will vary based on the livestock herd size and annual local rainfall. It's not uncommon for modern day manure lagoons to be quite large, reaching a surface area of multiple acres.

20. The Depeault reference [EX2003, U.S. Pat. No. 4,594,006], which was cited during prosecution and is listed on the face of the '425 Patent, further explains that the crust floating on the surface of manure lagoons can become relatively hard, can reach six feet in thickness, and has a consistency of dry peat moss:

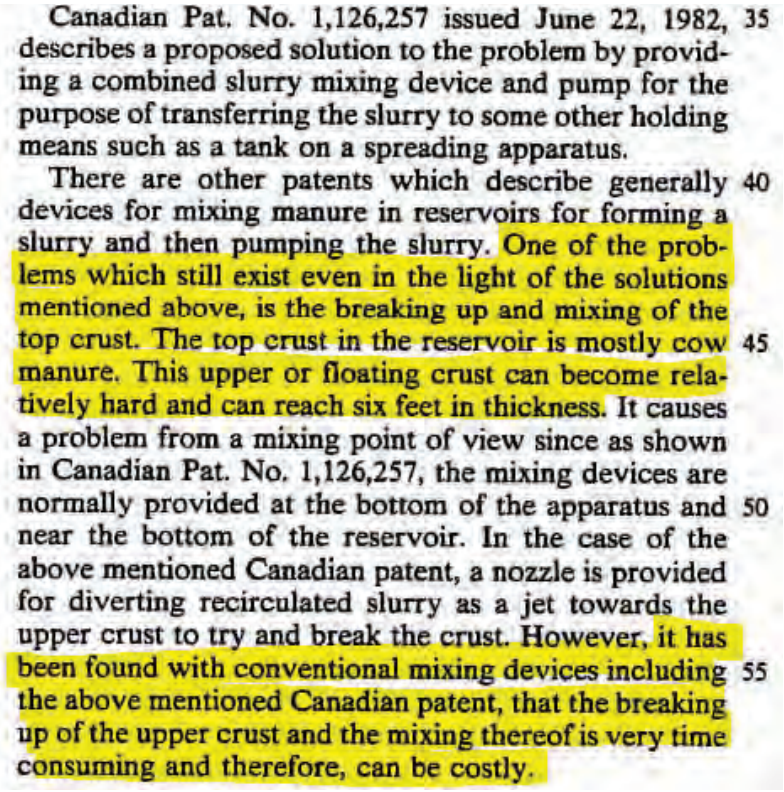


2. Description of the Prior Art

Farm animal manure is a slurry containing liquids and solids in suspension. Such manure must be held in holding reservoirs near a barn such as in-the-ground tanks or lagoons. A by product of keeping animal manure is that it can, when required, be spread by suitable spreaders on fields as a fertilizer. The apparatus for spreading the manure normally comprises a closed tank mounted on a vehicle and communicating with a spreader. When required, the manure in the holding reservoir must be transferred into the spreading tanks by suitable pumps.

However, the manure in the holding reservoir tends to separate and the solids may settle to form a thick layer at the bottom of the reservoir and may also form a thick solid crust on the surface of the liquids. Such crust has a consistency of dry peat moss and must therefore be broken up before it can be mixed with the liquid into a slurry and be transferred from the reservoir into the spreading apparatus. It is necessary, therefore, to provide an apparatus for both mixing the solids and forming a slurry with the liquids in the reservoir as well as to have a pumping apparatus for pumping the so-formed slurry into the tank for the spreading apparatus.

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Canadian Pat. No. 1,126,257 issued June 22, 1982, describes a proposed solution to the problem by providing a combined slurry mixing device and pump for the purpose of transferring the slurry to some other holding means such as a tank on a spreading apparatus.

There are other patents which describe generally devices for mixing manure in reservoirs for forming a slurry and then pumping the slurry. One of the problems which still exist even in the light of the solutions mentioned above, is the breaking up and mixing of the top crust. The top crust in the reservoir is mostly cow manure. This upper or floating crust can become relatively hard and can reach six feet in thickness. It causes a problem from a mixing point of view since as shown in Canadian Pat. No. 1,126,257, the mixing devices are normally provided at the bottom of the apparatus and near the bottom of the reservoir. In the case of the above mentioned Canadian patent, a nozzle is provided for diverting recirculated slurry as a jet towards the upper crust to try and break the crust. However, it has been found with conventional mixing devices including the above mentioned Canadian patent, that the breaking up of the upper crust and the mixing thereof is very time consuming and therefore, can be costly.

EX2003, U.S. Pat. No. 4,594,006, col. 1, ln. 13-58.

21. Manure lagoons are also unique in that the contents of a manure lagoon need to be agitated into as much of a homogenous mixture as possible across the entire lagoon so that the consistency, nutrients, and chemical distribution (e.g., pH) is as uniform as possible. This uniform consistency makes it easier for the manure pumping systems to work as efficiently as possible while also producing a consistent manure product. A homogenous manure product is preferred from an agronomic standpoint as farmers will reduce or eliminate the need for synthetic fertilizers applied to their crop production fields based on the nutrient quality of the manure. If the nutrient consistency of the manure product is highly variable the product will have less economic value and might even cause environmental harm if nutrient content is higher than can be retained by the soils and plants. *See* EX2019, pp. 1, 7.

22. These aspects present a unique operating environment for manure agitation vehicles.

23. In the 2013-2014 time period (which coincides with the dates when the Patent

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Owner filed its provisional application and PCT application), farmers agitated manure lagoons with either pumps situated at the edge of the manure lagoon, which were typically driven by the PTO of an agricultural tractor (*see, e.g.*, the manure pump described in Depeault [EX2003]) or floating manure agitation "boats" (*see, e.g.*, the vehicle described in Puck [EX1014]).

24. In the 2013-3014 time period, floating manure agitation "boats" were barge-like structures that had to be launched and retrieved using a trailer and/or tractor. This is depicted in the screenshots attached as EX2008 and copied below, which are from a video taken by the Progressive Dairyman publication of a manure agitation boat demonstration held in 2014.

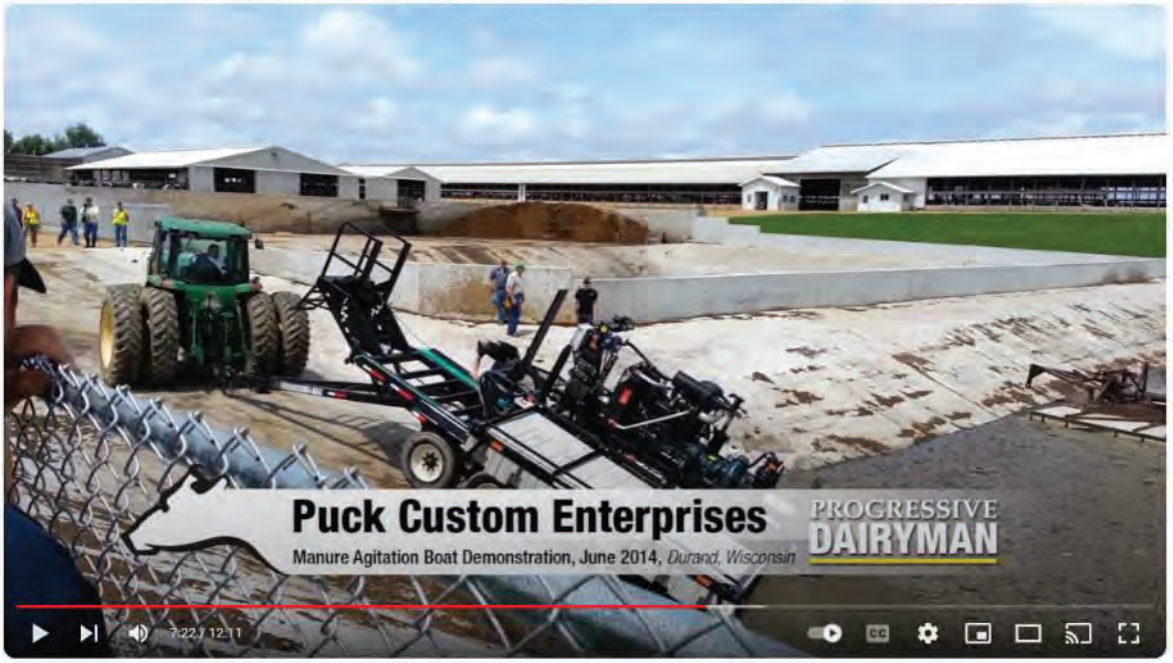
25. On October 2, 2023, I personally accessed and viewed this Progressive Dairyman video, which is posted on YouTube at the following link: https://www.youtube.com/watch?v=FXRS-9Ip1pE. The YouTube website indicates that this video was posted on July 9, 2014 by Progressive Dairy and that it has received around 69,000 views.

26. On October 2, 2023, I took screenshots from this Progressive Dairyman video and compiled them as EX2008. I therefore certify that the screenshots shown in EX2008 are true and correct images of the Progressive Dairyman video identified in the paragraph above.

27. The Progressive Dairyman video shown in EX2008, states that the manure agitation boat demonstration that is depicted in the video was held in Durand, Wisconsin during the month of June, 2014.

28. Notably, this manure agitation boat demonstration featured traditional manure agitation boats, including the commercial embodiment of the Puck reference [EX1014], alongside the Patent Owner's newly-released amphibious manure agitation vehicle:

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Equipment demonstrations: Manure agitation boats

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Equipment demonstrations: Manure agitation boats

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EX2008, pp. 4-5.

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29. As this video illustrates, the Patent Owner's commercial embodiment of the '425 Patent was the first of its kind and was the only amphibious manure agitation vehicle that could be driven into, operated within, and driven out of the manure lagoon by wireless remote control – meaning that it did not require a tractor and/or trailer for launching and retrieval.

30. The North American Manure Expo is an annual industry trade show and educational event focused on livestock manure technologies. The Manure Expo brings together livestock producers, industry professionals, and equipment providers from across the country with the sole focus of livestock manure management. Their most recent exhibitors list, which is posted on their website at https://www.manureexpo.ca/, identifies only companies that are focused on livestock manure management, including lagoon management and agitation systems. I was unable to find any product or service on this list associated with marine dredging, which are the types of products cited by the Petitioner.

31. On October 2, 2023, I took screenshots from the North American Manure Expo website and compiled them as EX2020. I therefore certify that the screenshots shown in EX2020 are true and correct images of the North American Manure Expo website identified in the paragraph above.

32. The Truxor and SenwaTec references [EX1006] and [EX1012] cited by the Petitioner do not show that it would have been obvious for equipment designed for marine dredging to be used to pump and agitate livestock manure lagoons. Dredging, by dictionary definition, is "to dig, gather or pull out with or as with a dredge" or "to deepen (a waterway) with a machine that removes earth usually by buckets on an endless chair or suction tube". EX2021, p. 2. Dredging equipment is designed to excavate solids from the bottom of shallow bodies of water and transfer those solids to another location. Its design purpose is NOT to agitate and break-up both bottom solids and floating surface crust with the intention of creating a homogenous slurry throughout the entire pond/lagoon like that is desired in a manure lagoon prior to pump-out.

33. As noted, dredging is to dig, excavate, or remove solids from the bottom of shallow

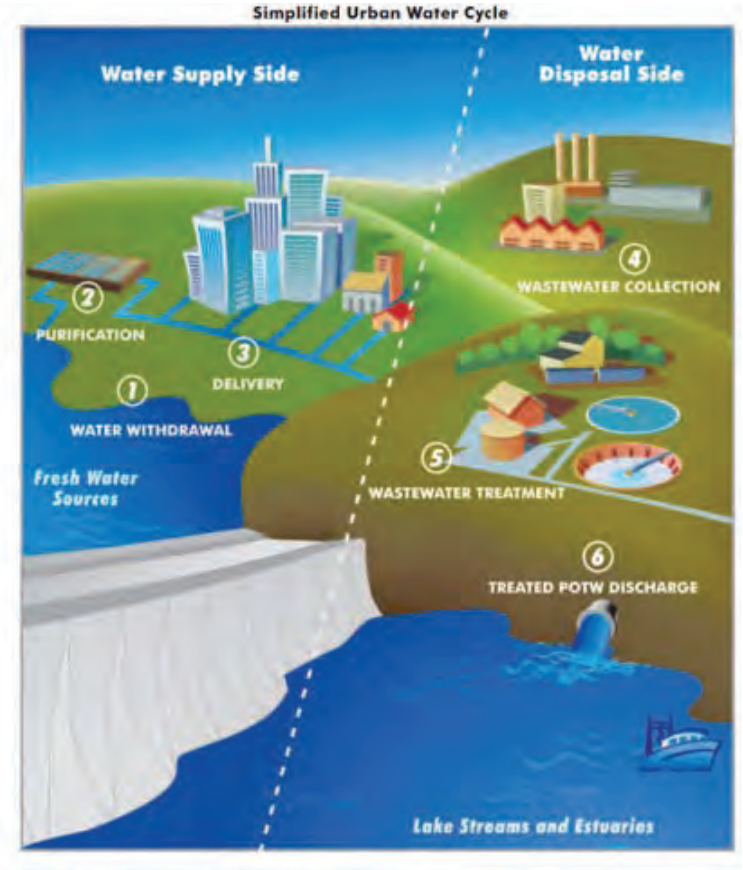
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bodies of water and transfer those solids to another location, whereas agitation, by definition, is the "act or an instance of agitating something: a moving back and forth or with an irregular, rapid, or violent action". EX2021, p. 2. Unlike with dredging, the agitation of a manure lagoon recirculates suspended solids rather than removing them from the lagoon. EX2021, p. 3.

34. The Petitioner also discusses municipal waste lagoons and livestock manure lagoons as if they were the same thing. The reality is that a municipal lagoon is NOT the same as a livestock manure lagoon. In the treatment of human waste, sewer systems are designed to carry human waste, including from domestic, industrial, and commercial sources, to wastewater treatment facilities. EX2022, p. 9. Typical wastewater treatment facilities for the treatment of human waste include a primary treatment stage and a secondary treatment stage. EX2022, p. 9. In the primary treatment stage, "[c]oarse solids are removed from the wastewater." EX2022, p. 9. Additionally, typical wastewater treatment facilities utilize preliminary treatment units before the primary and secondary treatment stages. EX2022, p. 9. During the preliminary treatment, a "screen removes large floating objects, such as rags, cans, bottles and sticks that may clog pumps, small pipes, and down stream processes. The screens vary from coarse to fine and are constructed with parallel steel or iron bars with openings of about half an inch, while others may be made from mesh screens with much smaller openings." EX2022, p. 9. Following screening, the wastewater flows "into a grit chamber where sand, grit, cinders, and small stones settle to the bottom," and this grit and screenings are periodically collected and removed from the system. EX2022, p. 10. After screening, primary sedimentation takes place. EX2022, p. 11. At that point, "wastewater still contains dissolved organic and inorganic constituents along with suspended solids." EX2022, p. 11. Therefore, the wastewater enters a sedimentation tank, at which point the water is slowed down and the suspended solids gradually sink to the bottom of the tank and form a mass of solids called primary sludge. EX2022, p. 11. This primary sludge is removed from the sedimentation tank. EX2022, p. 11. After the primary treatment process is the secondary treatment stage, during which "up to 90 percent of the organic matter in wastewater" is removed "by using biological treatment

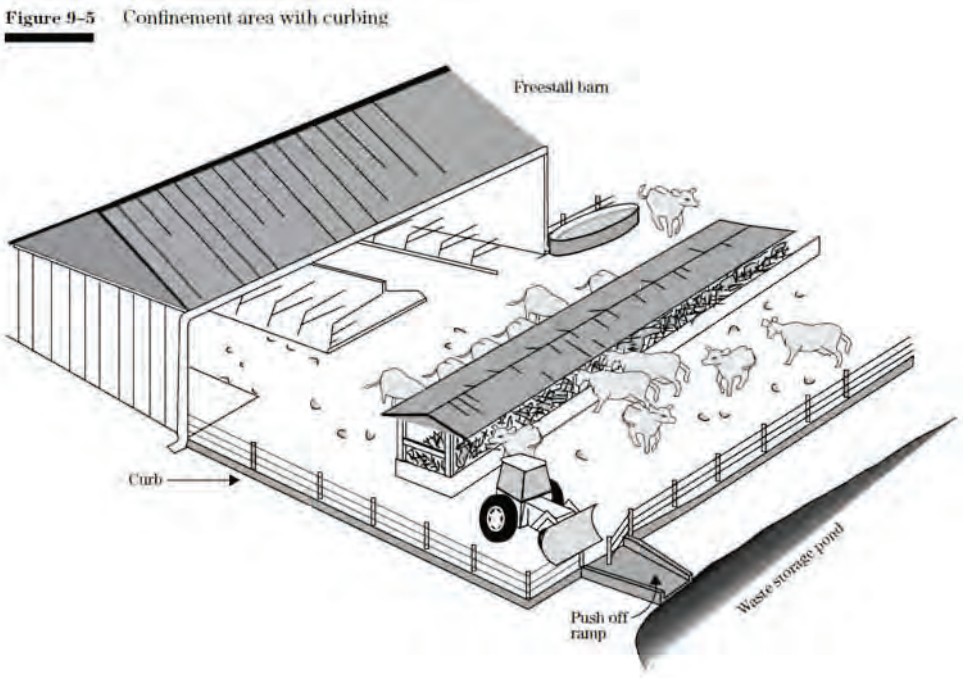
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processes," such as through attached growth processes and/or suspended growth processes. EX2022, pp. 11. It is during this secondary stage, after coarse solids, grit, sand, and suspended solids have already been removed from the wastewater, that a municipal lagoon may be employed to use "sunlight, algae, bacteria, and oxygen to interact" to "improve water quality" and "purify wastewater." EX2022, pp. 13-14, 27. As such, a municipal lagoon is typically placed at the end of the wastewater treatment process and is primarily meant to disinfect the water before it's released back to the environment:



EX2022, p. 7. This multi-step process to remove solids and sediment from human waste *before* being deposited into a municipal waste lagoon is much different than the process of filling livestock manure lagoons. Specifically, a livestock manure lagoon receives its material directly from the livestock barn and often includes water, livestock feed, bedding, sand, livestock feces, and livestock urine:

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EX2023, p. 13, Figure 9-5. These materials stratify once they enter the manure lagoon and need to be periodically agitated to allow effective biological breakdown and removal. A large amount of the solids and debris found in manure lagoons is bedding material, such as straw and sand, that sticks to the manure and gets washed into the manure lagoon. When this material settles out, the straw floats, contributing to the surface crust, and the sand sinks to the bottom. EX2019, p. 5. Due to the differences between the composition and treatment of human waste versus animal manure, a POSITA would have understood that the requirements for pumping human waste in a municipal sewage lagoon or pond is different than the requirements for pumping manure in a manure lagoon.

V. OVERVIEW OF THE '425 PATENT

35. The '425 Patent, titled "AMPHIBIOUS PUMPING VEHICLE," issued on June 14, 2022, from U.S. Patent Application No. 17/590,125, which was filed on February 1, 2022. The '425 Patent claims priority to U.S. Provisional Patent Application No. 61/867,598, which was filed on August 19, 2013. EX1001, '425 Patent, pp. 1-2.

36. There are a total of 21 claims in the '425 Patent, all of which have been challenged in the Petition. Claim 1, which is copied below, is the sole independent claim:

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1. An amphibious vehicle comprising:

a floatable vehicle body;

ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor;

a fluid pump for pumping liquid manure;

a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump; 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 fluid 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.

EX1001, col. 8, ln. 36-52.

37. The "BACKGROUND" section of the '425 Patent explains that animal manure produced by cattle and hogs is typically washed into a manure lagoon for storage and later pump out for land application as fertilizer:

BACKGROUND

Manure produced during animal husbandry, particularly hog and cattle manure, is transferred by washing to a pit or lagoon for storage prior to removal for land application or further processing. During storage, a crust can develop on the surface of the pit or lagoon that must be disrupted prior to or during removal of the manure. Pumps are employed for this purpose with jets that return a percentage of the manure back to the pit or lagoon in the form of a high volume spray to disrupt the crust and recirculate the manure. Pumps for use in recirculating manure from smaller pits are known; however, these pumps are typically suitable for accessing the pit or lagoon from its edge and are connected to a tractor or similar land vehicle for operational power. They are therefore limited in their ability to recirculate manure to the middle of large lagoons, which are becoming increasing common as the size of animal husbandry operations increases.

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EX1001, '425 Patent, col. 1, ln. 33-49. As explained above, one unique problem that occurs with manure lagoons is that over time a floating "crust" develops on the surface of the manure lagoon that must be disrupted (i.e., broken up) before pump out.

38. The '425 Patent specification explains that operation of the claimed amphibious vehicle in a manure lagoon disrupts the crust and recirculates the manure:

> In operation, an operator uses the remote controls to maneuver the vehicle to the lagoon entrance, drive the vehicle into the lagoon, raise the ground engaging propulsion structure (wheels), lower the fluid pump, begin pumping fluid with the fluid pump through the fluid conduits and selectively open at least the second fluid nozzles to cause the vehicle to move out on to the surface of the lagoon. The valves associated with the side fluid nozzles may also be opened or closed to provide directional control of the vehicle on the lagoon. Once the vehicle is in the desired position, the valves associated with the first fluid nozzle are opened and the first articulation structure is used to position the first fluid nozzle at a desired angular orientation relative to the vehicle body. This is generally an upward orientation so that the fluid is sprayed widely to break crusts of material floating on the surface of the lagoon. In this manner, fluid is recirculated and directed to desired locations in the lagoon. As fluid is emptied from the lagoon, the floating vehicle is permitted to lower with the fluid level. When the lagoon has been sufficiently emptied, the operator is able to reverse the foregoing process in order to maneuver the vehicle to the lagoon exit, lower the wheels, and drive the vehicle up the muddy bank out of the lagoon.

EX1001, '425 Patent, col. 8, ln. 5-27.

39. After reading the entire disclosure, a POSITA would come away with the understanding that the amphibious vehicle claimed in the '425 Patent is not a general-purpose amphibious vehicle, but rather is one that is specially adapted for the particular purpose of breaking up the crust that forms on the surface of manure lagoons and recirculating the manure in manure lagoons.

VI. COMMERCIAL EMBODIMENTS

40. Nuhn has its own YouTube channel with videos showcasing its products. On October 2, 2023, I personally accessed and viewed a video showcasing Nuhn's Lagoon Crawler,

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which is posted on YouTube at the following link:

https://www.youtube.com/watch?v=fEgvvq9HZkk

The YouTube website indicates that this video was posted on November 6, 2014 by Nuhn and that it has received around 42,000 views.

41. On October 2, 2023, I took screenshots from this video of Nuhn's Lagoon Crawler and compiled them as EX2006. I therefore certify that the screenshots shown in EX2006 are true and correct images of the Nuhn video identified in the paragraph above.

42. Below is a screenshot taken from a video of Nuhn's Lagoon Crawler, which I understand to be the Patent Owner's commercial embodiment of the '425 Patent, breaking up the surface crust formed on a manure lagoon:



EX2006, p. 2.

43. Like Nuhn, Bazooka-Farmstar ("Bazooka") also has its own YouTube channel with videos showcasing its products. On October 2, 2023, I personally accessed and viewed a video

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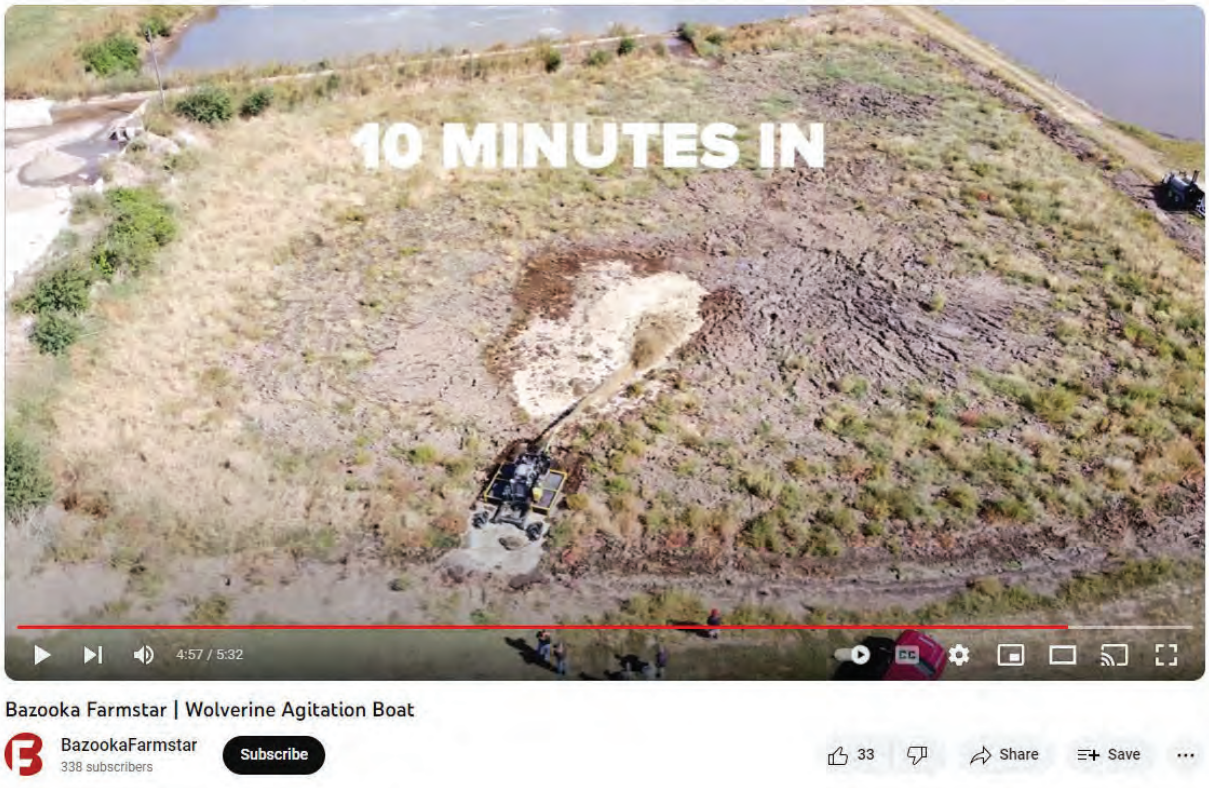
showcasing Bazooka's Wolverine Agitation Boat, which is posted on YouTube at the following link:

https://www.youtube.com/watch?v=3y3bSJJUOps

The YouTube website indicates that this video was posted on July 11, 2021 by BazookaFarmstar and that it has received around 6,000 views.

44. On October 2, 2023, I took screenshots from this video of Bazooka's Wolverine Agitation Boat and compiled them as EX2007. I therefore certify that the screenshots shown in EX2007 are true and correct images of the BazookaFarmstar video identified in the paragraph above.

45. Below is a screenshot taken from a video of Bazooka's Wolverine Agitation Boat, which I understand to be the accused product in the underlying litigation, breaking up the surface crust formed on a manure lagoon:



EX2007, p. 3.

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46. As these videos demonstrate, the crust that forms on the surface of manure lagoons can become quite dense and overgrown with grass and other plants, making agitation and pump-out difficult.

VII. APPLICABLE LEGAL STANDARDS AND PRINCIPLES

47. 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.

48. 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

49. 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

50. 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.

51. I understand that the prior art reference does not have to use the same words as

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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.

52. 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

53. 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.

54. 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.

55. 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.

56. 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

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claim at issue; and (4) as appropriate, secondary considerations of non-obviousness.

VIII. PERSON OF ORDINARY SKILL IN THE ART

57. I understand that Petitioner asserts that a person of ordinary skill in the art ("POSITA") for the technology underlying the '425 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*.

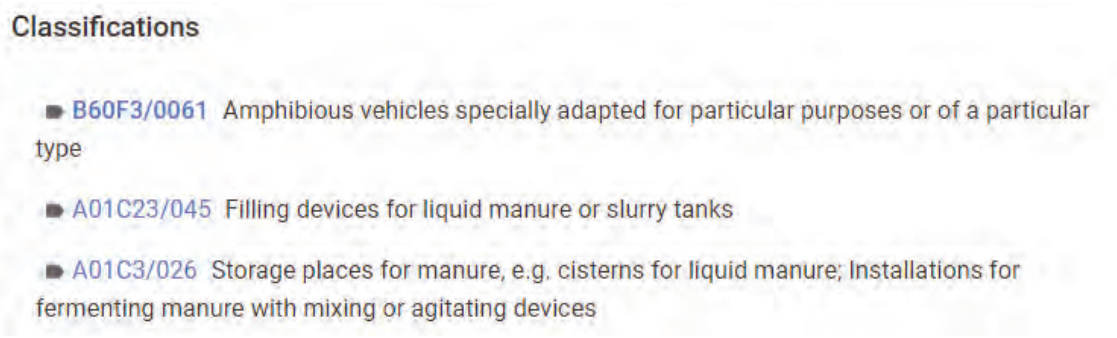
58. I disagree with the Petitioner's definition of a POSITA because it excludes those most familiar with manure agitation equipment – livestock farmers and commercial manure applicators. A commercial manure applicator is a person who is employed by a business entity engaged in the business of transporting, handling, storing, or applying manure for a fee. *See* EX2024.

59. 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.

60. The '425 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, '425 Patent, col. 1, ln. 26-49; col. 3, ln. 14-21; col. 7, ln. 20-46; col. 8, ln. 5-25.

61. Moreover, the '425 Patent has been classified as being directed to "amphibious vehicles specially adapted for particular purposes" and "manure" handling:

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EX2009, p. 2.

62. The '425 Patent does not suggest that the claimed vehicle finds utility in doing anything other than operating in manure lagoons.

63. 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."

64. 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.

IX. CLAIM CONSTRUCTION

65. 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.

66. I have given particular consideration of two limitations from the Challenged Claims of the '425 Patent: the phrase "a fluid pump for pumping liquid manure" and relatedly the term

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"liquid manure."

67. As an initial matter, it is my opinion that the positions advanced by Petitioner's declarant, Dr. Winkel, are divorced from the real life conditions that POSITAs face in manure lagoon management and are focused on the pumping of liquid manure ***after*** it has been agitated and the hard, thick crust that forms on liquid manure lagoons is disrupted. As stated herein, it is my opinion that a POSITA, in view of the specification of the '425 Patent, would understand that the claimed invention is directed to an amphibious vehicle specially adapted for the particular purpose of breaking up the crust that forms on the surface of manure lagoons and recirculating the manure in manure lagoons. It is also my opinion, as described herein, that a POSITA would understand "liquid manure" to be "animal manure contained in a farm lagoon, which includes suspended solids." It is my opinion that a POSITA would **not** understand that the term a "fluid pump for pumping liquid manure" to be merely a water pump as Dr. Winkel and Petitioner suggest. In its institution decision, the Board indicated that it was construing the term "fluid pump for pumping liquid manure" to "require a pump with a structure that is capable of pumping liquid with suspended solids." Paper 12 at 12. It is my opinion that a POSITA, in view of the specification of the '425 Patent, would understand those suspended solids to include any solids in the liquid manure, including bedding material and the crust, and that a POSITA would understand that the crust can be very hard, very thick, and very large. Therefore, it is my opinion that Petitioner and Dr. Winkel are wrong in ignoring the existence of and the need to break up the crust in manure lagoons.

A. "liquid manure"

68. It is my understanding that Petitioner argues that the words "liquid manure" in the Challenged Claims of the '425 Patent means "manure with less than 5 percent suspended solids." Petition, pp. 34-35. I also disagree with this claim construction.

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1. SOLIDS CONTENT OF LIQUID MANURE

69. Dr. Winkel asserts that "liquid manure contains the lowest level of solids and generally has very similar characteristics and physical properties to water" and that liquid manure "generally does not present any special pumping problems." EX1004, ¶ 83. He also states that a "POSA would have understood the solids concentration in the liquid volume of a typical liquid manure lagoon is on the order of a few percent or less." *Id*. at ¶ 87. Specifically, Petitioner and Dr. Winkel place an artificial 5 percent suspended solids upper limit on their definition of "liquid manure." *See, e.g.*, EX1004, ¶ 101. Dr. Winkel's purely academic view of what the percent total solids content of liquid manure and liquid manure lagoons is betrayed by the reality of what POSITAs encounter in real-world manure lagoons, many of which are not always properly managed. Variations of management can result in real-world variations of total solids content of liquid manure and liquid manure lagoons.

70. Petitioner's definition for "liquid manure" comes from a waste management handbook that appears to be extrinsic evidence because the handbook was not referenced in the '425 Patent specification, on the face of the '425 Patent, or during prosecution.

71. Moreover, the classifications found in this handbook are simply a suggested guideline with which to classify manure consistencies as either liquid, slurry, semisolid or solid from a handling characteristic for different livestock categories. In fact, Chapter 4 from the Agricultural Waste Management Field Handbook states that while the handbook provides a single value for a certain waste characteristic, "[w]aste characteristics are subject to wide variation; both greater and lesser values than those presented can be expected":

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(b) Variations and ranges of data values

In most cases, a single value is presented for a specific waste characteristic. This value is presented as a reasonable value for facility design and equipment selection for situations where site-specific data are not available. Waste characteristics are subject to wide variation; both greater and lesser values than those presented can be expected. Therefore, much attention is given in this chapter to describing the reasons for data variation and to giving planners and designers a basis for seeking and establishing more appropriate values where justified by the situation.

U.S. DEP'T AGRIC., *Agricultural Waste Characteristics, in* AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK, 4-2, ch. 4 (2008) ("AWMFH") (EX1062 at 10). Dr. Winkel points to this handbook to argue that "'[w]astes that have a moisture content of 95% or more [(%TS of 5% or less)] exhibit qualities very much like water are called liquid waste or liquid manure.'" EX1004, ¶ 91. However, the very same paragraph from which Dr. Winkel cites provides that "the moisture content and range indicated above ***must be considered generalizations subject to variation and interpretation***":

Wastes are often given descriptive names that reflect their moisture content such as liquid, slurry, semisolid and solid. Wastes that have a moisture content of 95 percent or more exhibit qualities very much like water are called liquid waste or liquid manure. Wastes that have moisture content of about 75 percent or less exhibit the properties of a solid and can be stacked and hold a definite angle of repose. These are called solid manure or solid waste. Wastes that are between about 75 and 95 percent moisture content (25 and 5 percent solids) are semiliquid (slurry) or semisolid (chapter 9). Because wastes are heterogeneous and inconsistent in their physical properties, the moisture content and range indicated above must be considered generalizations subject to variation and interpretation.

EX1062 at 13 (AWMFH at 4-5) (emphasis added). Chapter 4 of the AWMFH goes on to state that "[w]hen compared to other types of manure data, the data given for as excreted manure

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characteristics is the most reliable. ***The properties of manure and other wastes will vary widely when modified by management actions***." EX1062 at 17 (AWMFH at 4-9) (emphasis added).

72. The *Liquid Manure Application Systems Design Manual* ("LMASD Manual") [EX1040] cited by Dr. Winkel, describes that "***[l]iquid manures can vary*** from dilute, colored water from feedlots ***to thick 'milk shake' slurries*** containing solids." EX1040 at 11 (emphasis added). A POSITA that has ever attempted to drink a milk shake through a straw knows that it is not just like drinking water through a straw. Not only recognizing a wide variance in liquid manure composition, the LMASD Manual also recognizes that there is no "universally accepted" limit on the percent solid content. *See id.* at 15 ("Because of the wide variability between animal management systems, there is no universally accepted set of values defining the volume and nutrient composition of farm manures."). Nonetheless, the LMASD Manual acknowledges that liquid manure can have a much higher total solids content than Petitioner and Dr. Winkel assert. Specifically, the LMASD Manual states that "[l]iquid 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." EX1040 at 17 (emphasis added); *see also id*. at 16 ("***When the total solids content is between 4% and 12%, special chopper pumps*** and sprinklers ***must be used*** to avoid equipment clogging problems.") (emphasis added); *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%). As such a POSITA would have understood that liquid manure could have total solids content significantly higher than 5% and importantly, is not limited to liquids having 5% or less total solids.

73. Additionally, a POSITA would not understand there to be a meaningful difference between the terms "liquid manure" and "slurry." For example, the LMASD Manual treats them

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the same, indicating that "[t]he two terms 'liquid manure' and 'slurry' will be used ***interchangeably*** throughout this manual." EX1040 at 16 (emphasis added); *see also* EX1041 at 3 (equating liquid and slurry manure, noting under the heading "Liquid (slurry) manure" that "[a]gitation of the manure storage before and during pumping is recommended to reduce the buildup of solids and for a consistent application of sampled nutrients."); *id*. at 2 ("a liquid (such as a slurry or lagoon effluent)"). Even Puck uses the terms "liquid manure" and "slurry" interchangeably. *See* EX1014 at ¶ [0025] ("[A] liquid manure pump such as a slurry pump (38)."); *id*. at ¶ [0026] ("[A] liquid manure intake, such as a slurry intake.").

74. Chapter 12 of the AWMFH, also cited to by Dr. Winkel, shows that in real-world scenarios, stored liquid manure has a high solids content. *See* EX1066 at 43 ("A closed impeller is efficient with liquid waste, but plugging with tough, stringy solids and chunks can be troublesome."); *id*. at 42 ("The solids and liquids in liquid, slurry, and semisolid wastes need to be thoroughly mixed so the solids are not left behind when these wastes enter the pump.").

75. Therefore, the intrinsic and extrinsic evidence does **not** support Dr. Winkel's statement a "POSA would have understood the solids concentration in the liquid volume of a typical liquid manure lagoon is on the order of a few percent or less." EX1004, Winkel Decl. ¶ 87.

76. Several prior art patents cited on the face of the '425 Patent also use the term "liquid manure" in describing their inventions. These patents use the term "liquid manure" to broadly refer to the contents of a manure lagoon as opposed to narrower formulations based on the percentage of total solids (%TS) like in the Petitioner's construction. *See, e.g.*, US9462741B2 to Puck [EX2013]; US9572297B2 to Puck [EX2014]; DE2364962A1 to Kronseder [EX2015][1]; DE3431345A1 to Lüllmann [EX2016][2]. Nor do the other patents cited on the face of the '425 Patent that describe manure agitation equipment limit the scope of their inventions based on the

[1] EX2015 is from the file history of the '425 Patent and corresponds to pp. 170-188 of EX1002.

[2] EX2016 is from the file history of the '425 Patent and corresponds to pp. 155-169 of EX1002.

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percentage of total solids (%TS). *See* US4594006A to Depeault [EX2003]; CA2002619A1 to Depeault [EX2017]; US4406413A to Houle [EX2010]; US10118138B2 to Tews [EX2018]. Therefore, I do not see any evidence that anyone in the art has limited their manure agitation inventions in the way Petitioner is suggesting.

77. Chapter 12 of the AWMFH [EX1066] referenced by the Petitioner discusses handling characteristics of different categories of manure. What the referenced figure (Figure 12-92) does not fully reflect is that manure agitation equipment must be capable of pumping all of the different classes of manure shown in Figure 12-92, because they may all be present in a manure lagoon when agitation is needed. This is due to the fact that manure typically becomes **stratified and settled out** over time. When agitation begins, the manure in the manure lagoon is not yet mixed and can consist of pure liquid, solids at the bottom, localized solid buildup, and a grassy field-like crust on the top. The intent of manure agitation equipment such as that shown in the '425 Patent specification is to be able to break up and agitate all manure categories from liquid through solids, where they are all mixed together during the agitation process. The well-mixed contents of the manure lagoon is then pumped out. As a result, manure agitation equipment must be capable of handling greater solids than manure pump-out equipment.

2. SOLID PARTICULATE SIZE IN LIQUID MANURE

78. Dr. Winkel goes on to argue that particle sizes of liquid are sufficiently small such that they would not plug a water pump. *See* EX1004, Winkel Decl. ¶ 92. Dr. Winkel's opinion is flawed. Specifically, Dr. Winkel alleges that manure particle size "is dominated" in the 1 to 6 mm range. *Id*. at ¶ 93 (citing EX1043 at 9). The portion of Wright [EX1043] quoted by Dr. Winkel refers to the particle size dimension (PSD) of fresh "[r]aw manure sample, provided by a Holstein milk cow that was 2-years, 4-months old, was collected within 60-seconds of its deposition on the impervious floor surface at the free-stall area." EX1043 at 6. Additionally, the images included by Dr. Winkel were manure particles collected from "flush water and feed-alley drainage streams." *Id*.; *see also id*. at 9. Neither of these represent the solid particle size in liquid manure in a manure

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lagoon. Therefore, both of these cited sections of Wright [EX1043] and the dimensions are completely divorced from what a POSITA would understand to be liquid manure in a manure lagoon. Therefore, Dr. Winkel's statements are inapplicable.

79. Dr. Winkel ignores that some of the other exhibits he cites to reference liquid manure as having a much larger particle size. For example, Pfost I [EX1041] describes that "[a]n open-impeller centrifugal pump capable of handling large solids ***up to 1 inch in diameter*** may be selected for pumping livestock slurry to minimize clogging problems. Open impeller pumps may handle ***liquids with solids content up to 15 percent***." EX1041 at 4 (emphasis added). Pfost I [EX1041] further describes that "long, fibrous solids" may be present in the liquid manure. *See id.* at 6.

80. Dr. Winkel also ignores that, as described in the '425 Patent, the liquid manure in liquid manure lagoons often have crusts suspended thereon. *See* EX1001, '425 Patent, 1:36-41. 8:18-20. A POSITA would have understood that these crusts are solids that have sizes much larger than the 1 to 6 mm range asserted by Dr. Winkel. Again, Depault notes that this thick solid crust "can become relatively hard and can reach six feet in thickness." EX2003, col. 1, ln. 46-47. Moreover, this crust has a "consistency of dry peat moss and must therefore be broken up before it can be mixed with the liquid into a slurry." *Id.* at col. 1, ln. 26-30. A POSITA would have understood that a hard crust reaching six feet in thickness is larger than 1 to 6 mm in size. Moreover, Houle recognizes that the solid matter in liquid manure—be it in the crust or the solids that settle on the bottom of the manure lagoon—tend to clog liquid manure pumps, noting that "clogging of the pump's impeller and consequential loss of pump efficiency remains a serious shortcoming." EX2010, U.S. Pat. No. 4,406,413, col. 1, ln. 24-63.

81. The LMASD Manual also recognizes the common occurrence of crusts in liquid manure, which again illustrates that the solid particle size is not 1 to 6 mm as asserted by Dr. Winkel. "In many dairy storages, liquid manure is deposited directly into the top by mechanical or tractor scrapers. With beef and dairy manure, ***a floating mat or crust often forms on the surface***.

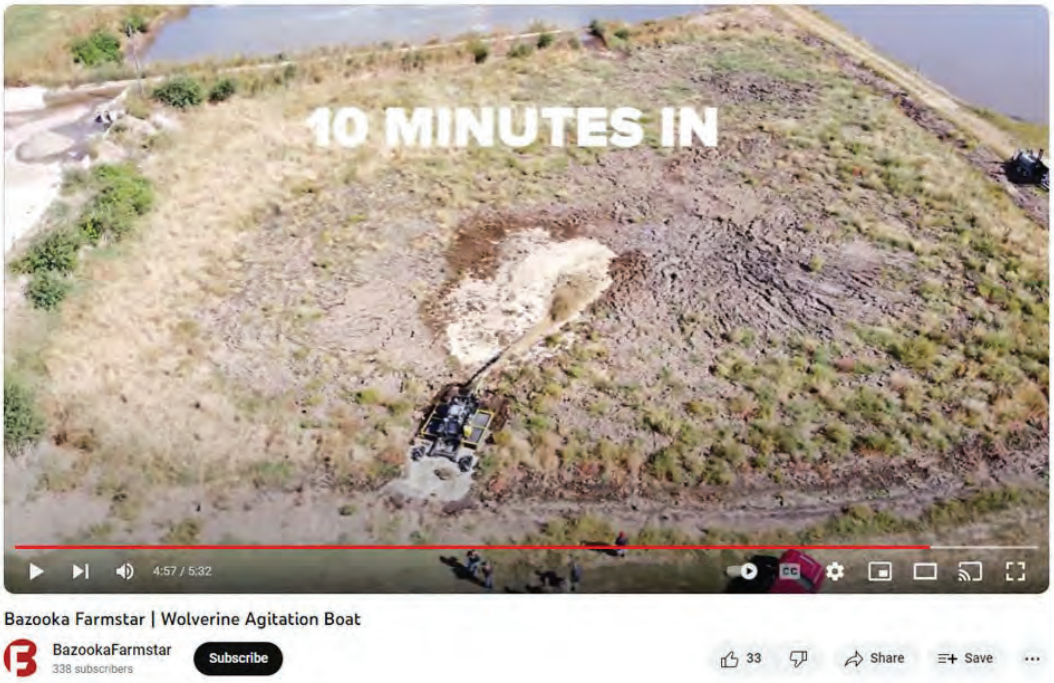
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Before a storage can be completely emptied, the crust should be broken up and settled solids agitated to obtain a homogeneous mix." EX1040 at 57 (emphasis added). The LMASD Manual describes that "[a]gitation is usually required before emptying storages with liquid manures over 4% total solids." *Id*. If solid particulate size were 1 to 6 mm as Dr. Winkel incorrectly suggests, it is not clear why agitation would be "usually required" before pumping out liquid manure from the lagoon.

82. Other references also illustrate that the size of solid particles in liquid manure are not limited to 1 to 6 mm. For example, "[a]t the farm-scale, slurry crusting was found to be commonplace across a large proportion (ca 80%) of slurry storage facilities, despite the fact that regular store mixing and agitation was found to be carried out on 68% of farms." EX2030, K. Smith et al., *Natural Crusting Of Slurry Storage As An Abatement Measure For Ammonia Emissions On Dairy Farms*, 97 BIOSYSTEMS ENGINEERING 464 (2007); *see also id* at 466 (noting "[a] slurry crust was found in 39 (78%) of the 50 stores initially inspected"). These commonly-forming crusts, can "become colonized by vegetation including small trees and may become ***very difficult to break up***." *Id*. at 465 (emphasis added). It is hard to imagine vegetation and small trees growing on solid particles only 1 to 6 mm in size.

83. I include here again the below screenshot from a video of Bazooka's Wolverine Agitation Boat breaking up the surface crust formed on a manure lagoon:

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EX2007, p. 3. As can be clearly seen, the crust in the liquid manure covers the entire manure lagoon and has vegetation growing on it, giving it the appearance of solid ground. Prior to agitation, this crust has solid particles much larger than the 1 to 6 mm alleged by Dr. Winkel.

84. Beyond just the crust in the liquid manure, a POSITA would have understood that liquid manure often has other solids therein, including for example "bedding and other solid additions to manure [that] tend to limit handling options for the resulting liquid manure or slurry mixture." EX1040 at 16. Dr. Winkel does not mention or acknowledge the existence of bedding in liquid manure. His failure to account for bedding further shows that his opinions on the consistency of liquid manure and the solid particle size therein are not in line with what a POSITA would understand liquid manure to be. The LMASD Manual describes the use of bedding in animal stalls and pens and the impact that bedding has on the flowability and pumpability of liquid manure:

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Bedding Additions

Bedding is spread in stalls and pens to keep animals clean, dry, and comfortable while resting. Because of the wide variety of organic and inorganic bedding materials that may be used (sand, paper, straw, etc.), moisture/solids content alone cannot be used to describe all the handling properties of a manure mixture. Animal species, bedding decisions, and dilutions all affect the way a particular liquid manure mixture flows (its "flowability"), as well as its ability to be pumped (its "pumpability").

EX1040 at 17. A POSITA would have readily understood that bedding can have a significant impact on pumping liquid manure, an impact that Dr. Winkel ignores:

Several of the more common organic bedding materials, such as wood shavings, sawdust, and chopped hay or straw, absorb two and a half to three times their initial weight (when the bedding is at an initial moisture content of about 10%). Newspaper and tanbark (tanning bark) absorb four times their weight, while peat moss holds as much as ten times its weight in water. Use of such organic bedding materials has the following negative effects on the flowability and pumpability of a liquid manure mixture:

- absorbs free liquids and so reduces the manure's flowability
- makes it more difficult to pump and agitate the manure (e.g., because of wood chunks in sawdust)
- contributes to blocked pipes and channels
- forms stratified layers in liquid and slurry manure storages
- clogs irrigation nozzles
- alters the chemical and biological makeup of the manure.

Id. This too illustrates the error of Dr. Winkel's view that the solid size of liquid manure is 1 to 6 mm.

85. Other inorganic bedding materials are often found in liquid manure as well, "such as sand, ground limestone, or calcite," but "sand and other inorganic bedding materials significantly increase abrasive wear on pumps and handling equipment, often voiding manufacturer's warranties." EX1040 at 17. The LMASD Manual notes that the inclusion of

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organic or inorganic bedding "can strongly affect manure handling ability" and that "[t]he physical characteristics of a liquid manure mixed with inorganic sand bedding are quite different than those of a liquid manure mixed with an organic bedding such as sawdust, wood shavings, peanut hulls, etc., even if the moisture/ solids contents of the two manures are identical." *Id*. at 18. Therefore, a POSITA would have understood that liquid manure—in addition to the crust—often includes solid bedding materials, that greatly impact the size and composition of solids in the liquid manure as well as the equipment needed to pump the liquid manure. Dr. Winkel does not take any of this into consideration.

86. Accordingly, Dr. Winkel's categorical statement that liquid manure solids are between 1 and 6 mm in size is entirely at odds with what a POSITA would have understood.

3. VISCOSITY OF LIQUID MANURE

87. Viscosity is the resistance that a fluid (e.g., a gas or a liquid) system offers to flow when it is a subjected to a shear stress. It can also be referred to as flow resistance. *See* EX1040 at 72 (referring to "viscosity" as "resistance due to internal cohesion").

88. Dr. Winkel asserts that the "viscosity of liquid manure is generally accepted to be between 10 and 60 times that of water." EX1004, Winkel Decl. ¶ 94. Dr. Winkel provides no support for this statement that there is a "generally accepted" viscosity of liquid manure or that it varies "between 10 and 60 times that of water." The LMASD Manual relied upon by Dr. Winkel throughout his report in fact refutes this contention, instead stating that: "Viscosity values for liquid manures are ***not*** readily available. All variations in manure viscosities are not strictly attributable to moisture content." EX1040 at 72 (emphasis added). The LMASD Manual goes on to describe that "[p]rior to agitation, higher-solids liquid manures (over 4% TS) may exhibit initial viscosities similar to industrial or municipal wastewater sludges." *Id*. Importantly, the LMASD Manual describes that "High viscosity fluids like sludges (over 12% TS) usually require positive displacement type pumps (such as piston, diaphragm, or screw pumps) to push material through a pipeline at lower flow rates." *Id*. As described above, liquid manure can have total solids content

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over 12%. *See supra* at Section IX.A.1; *see also* EX1040 at 16 (referring to liquid manure with 12% TS), 18 (referring to liquid manure with 13% TS), 28 (referring to liquid manure with 14% TS). Again, this demonstrates that "conventional water pumps" as referred to by Dr. Winkel are not capable of pumping liquid manure. Although the LMASD Manual does indicate that "[o]nce these liquid manures are agitated, however, viscosity decreases and the pumped liquid has friction characteristics similar to water. Consequently, higher viscosity liquid manures (over 4% TS) should be agitated each time prior to pumping." *Id*. at 72. Again, as described above, it is my opinion that Petitioner and Dr. Winkel are incorrectly restricting their view of liquid manure to ***after*** it has been agitated and mixed. In view of the description of the '425 Patent, a POSITA would not have understood liquid manure to be limited to the consistency of liquid manure after agitation.

89. Not only does the LMASD Manual recognize that liquid manure can include and behave like a sludge before agitation, Puck cited by Petitioner does as well. Specifically, Puck describes the formation of "sludge that rests on the bottom of the manure lagoon" and that to "prevent an undesirable buildup of sludge at the bottom of the lagoon, it is known in the art to place an agitator within the lagoon to create a slurry by moving solids in sludge into suspension with the supernatant." EX1014 at ¶¶ [0003], [0004]. As noted above, both the LMASD Manual and Puck show that a POSITA would understand that liquid manure and slurry can be used interchangeably. *See* Section IX.A.1. Puck describes that during agitation, the solids from the sludge become suspended in the liquid manure. Puck also describes drawbacks of attempting to agitate manure lagoons from the edge of the manure lagoon. Namely that "it is difficult to mix sludge at the center of the lagoon, which leads to a buildup of sludge at the center of the lagoon." *Id*. at ¶ [0005]. A POSITA would have understood that if the sludge is allowed to build up over time that an agitation boat, like Puck's, could run aground on the sludge and get stuck. Petitioner's own website for its Wolverine Agitation Boat describes that its agitation boat can move "even in the thickest sludge ***where most pumps cannot operate***;"

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> Dual propellers are the secret sauce to moving large volumes of liquid manure and having extreme control over your agitation boat. Our ragless, high-speed propellers can move a whopping 24,000+ GPM every minute you agitate. (Yes...you read that right.)
>
> The propellers create 4,000 pounds of thrust for agitation and maneuvering functions directly below the boat, establishing a solid center of gravity for stability. That means this well-balanced machine can move in any direction, even in the thickest sludge where most pumps cannot operate.

EX2031 at 9.[3] This shows that Petitioner knows that "conventional water pumps" cannot pump liquid manure.

90. Dr. Winkel attempts to bolster his argument that a "conventional water pump" can pump liquid manure by stating that a "conventional water pump" can pump "fluids with viscosities more than one-thousand times that of water." EX1004, Winkel Decl. ¶ 94 (citing EX1044). He specifically asserts that "[o]ne study provides empirical relationships for predicting pump performance for fluid viscosities as much as 3000 times the viscosity of water and at pump flow rates up to 1800 GPM." EX1004, Winkel Decl. ¶ 94 (citing EX1044 at 11). Dr. Winkel overlooks the qualifiers included in ANSI Viscosity [EX1044] that severely undercut his high-level, blanket assertion about the capabilities of so-called "conventional water pumps." ANSI Viscosity [EX1044] describes "a generalized method for predicting performance of rotodynamic pumps on Newtonian liquids of viscosity greater than that of water" developed by the Hydraulic Institute (HI), but notes that "[p]erformance estimates using the HI method are only approximate" and that "[t]here are many factors for particular pump geometries and flow conditions that the method does not take into account." EX1044 at 9. Additionally, ANSI Viscosity [EX1044] explains that pump performance decreases with increasing fluid viscosity:

[3] On March 20, 2024, I personally accessed and viewed Bazooka's webpage for its Wolverine Agitation Boat at: https://www.bazookafarmstar.com/equipment/wolverine-agitation-boat/. On March 30, 2024, I printed this webpage and it is referenced herein as EX2031. On March 20, 2024, I also personally downloaded Bazooka's brochure for the Bazooka Wolverine Agitation Boat from: https://www.bazookafarmstar.com/wp-content/uploads/2023/01/Cutsheet-Wolverine-1.pdf. On March 30, 2024, I saved that brochure and it is referenced herein as EX2032.

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9.6.7.2 Introduction

The performance (head, flow, efficiency [η], and power) of a rotodynamic pump is obtained from the pump's characteristic curves, which are generated from test data using water. When a more viscous liquid is pumped, the performance of the pump is reduced. Absorbed power will increase and head, rate of flow, and efficiency will decrease.

EX1044 at 9.

91. Importantly, ANSI Viscosity [EX1044] explicitly states that "[t]he data used to develop the correction factors are based on tests of Newtonian liquids. ***Gels, slurries, paper stock, and other non-Newtonian liquids may produce widely varying results, depending on the particular characteristics of the liquids***." EX1044 at 12 (emphasis added). Dr. Winkel entirely 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.*, EX2033 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.").

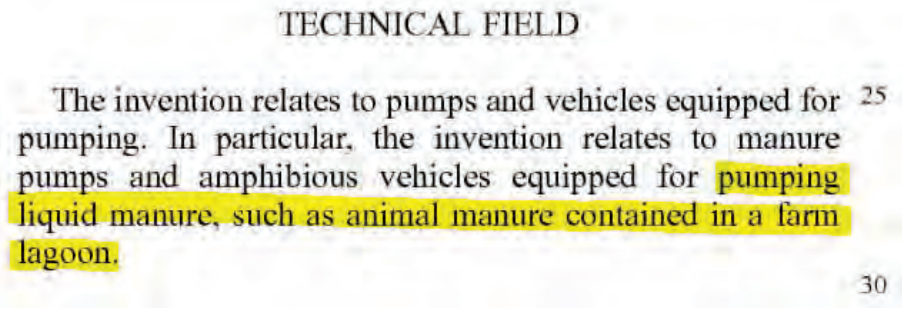
92. When liquid manure acts like a non-Newtonian fluid, Dr. Winkel's discussion of viscosity is entirely irrelevant because his basis improperly assumes that liquid manure exclusively acts like water (which is a Newtonian fluid).

93. Accordingly, in my opinion, a POSITA would not apply the Petitioner's narrow definition of "liquid manure" to the '425 Patent, but instead would interpret the references to

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"liquid manure" in the '425 Patent claims as the "animal manure contained in a farm lagoon, which includes suspended solids." It is my opinion that the suspended solids of liquid manure includes 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.

94. A POSITA would arrive at this interpretation after seeing that the Patent Owner equates "liquid manure" to "animal manure contained in a farm lagoon" in the TECHNICAL FIELD section of the '425 Patent:



TECHNICAL FIELD

The invention relates to pumps and vehicles equipped for pumping. In particular, the invention relates to manure pumps and amphibious vehicles equipped for pumping liquid manure, such as animal manure contained in a farm lagoon.

EX1001, '425 Patent, col. 1, ln. 25-29.

95. The '425 Patent specification also explains that liquid manure stored in a manure lagoon has a crust formed on its surface and includes solid materials that can clog traditional pumps:

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BACKGROUND

Manure produced during animal husbandry, particularly hog and cattle manure, is transferred by washing to a pit or lagoon for storage prior to removal for land application or further processing. During storage, a crust can develop on the surface of the pit or lagoon that must be disrupted prior to or during removal of the manure. Pumps are employed for this purpose with jets that return a percentage of the manure back to the pit or lagoon in the form of a high volume spray to disrupt the crust and recirculate the manure. Pumps for use in recirculating manure from smaller pits are known; however, these pumps are typically suitable for accessing the pit or lagoon from its edge and are connected to a tractor or similar land vehicle for operational power. They are therefore limited in their ability to recirculate manure to the middle of large lagoons, which are becoming increasing common as the size of animal husbandry operations increases.

Accordingly, there is a need for improved pumps and vehicles equipped for pumping, particularly pumps and vehicles suitable for use with large manure lagoons.

EX1001, '425 Patent, col. 1, ln. 33-53.

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, '425 Patent, col. 3, ln. 14-21.

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In operation, an operator uses the remote controls to maneuver the vehicle to the lagoon entrance, drive the vehicle into the lagoon, raise the ground engaging propulsion structure (wheels), lower the fluid pump, begin pumping fluid with the fluid pump through the fluid conduits and selectively open at least the second fluid nozzles to cause the vehicle to move out on to the surface of the lagoon. The valves associated with the side fluid nozzles may also be opened or closed to provide directional control of the vehicle on the lagoon. Once the vehicle is in the desired position, the valves associated with the first fluid nozzle are opened and the first articulation structure is used to position the first fluid nozzle at a desired angular orientation relative to the vehicle body. This is generally an upward orientation so that the fluid is sprayed widely to break crusts of material floating on the surface of the lagoon. In this manner, fluid is recirculated and directed to desired locations in the lagoon. As fluid is emptied from the lagoon, the floating vehicle is permitted to lower with the fluid level. When the lagoon has been sufficiently emptied, the operator is able to reverse the foregoing process in order to maneuver the vehicle to the lagoon exit, lower the wheels, and drive the vehicle up the muddy bank out of the lagoon.

EX1001, '425 Patent, col. 8, ln. 5-27. These statements in the '425 Patent directly conflict with Petitioner's attempt to define "liquid manure" as having an extremely low percentage of solids. As such, POSITA would understand that the "liquid manure" described in the '425 Patent, includes solids and a surface crust.

B. "a fluid pump for pumping liquid manure"

96. It is my understanding that Petitioner argues that the words "for pumping liquid manure" in this claim limitation is a recitation of "intended use" that does not limit the scope of the Challenged Claims and can be ignored in a patentability analysis. Petition, pp. 6 and 31-32. This does not make sense to me.

97. It is my opinion that a POSITA would not simply ignore the portion of this claim limitation reciting the function "for pumping liquid manure" because it is clear that the '425 Patent is generally directed to an amphibious vehicle whose sole purpose is pumping/agitating the manure in a manure lagoon. *See, e.g.*, EX1001, '425 Patent, col. 1, ln. 24-29, col. 1, ln. 33-52, col. 3, 14-

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21, col. 8, ln. 5-27.

98. In my opinion, a POSITA would not focus on the more general language of "amphibious pumping vehicle" found in the title of the '425 Patent, the preamble of Claim 1, which recites an "amphibious vehicle," and the first sentence in the TECHNICAL FIELD section as the Petitioner has done and arrive at the conclusion that the '425 Patent covers any amphibious pumping vehicle, given that the overall context of the '425 Patent is manure agitation. The inventor describes the problem to be solved by the '425 Patent as disrupting the crust and recirculating the manure in large manure lagoons where pumping from the edge of the lagoon is ineffective. EX1001, '425 Patent, col. 1, ln. 33-52. A POSITA would understand that the solution the inventor provides to this problem is the claimed amphibious vehicle. The inventor describes operating the claimed amphibious pumping vehicle in manure lagoons only and does not mention any other operating environment or purpose. EX1001, '425 Patent, col. 8, ln. 5-27. Based on this context, a POSITA would not ignore the references to "liquid manure" in the claims.

99. To the contrary, it is my opinion that, after reviewing the prosecution history, a POSITA would interpret the claim limitation requiring "a fluid pump for pumping liquid manure" as "a fluid pump that pumps manure." This is opposed to a pump that is merely capable of pumping liquid manure in the theoretical sense if someone attempted to put a pump to that use. In particular, a POSITA would see and rely on the fact that during *ex parte* reexamination, the USPTO found the Challenged Claims to be allowable because the prior art did not disclose "a pump that pumps manure":

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Reexamination

STATEMENT OF REASONS FOR PATENTABILITY AND/OR CONFIRMATION

The following is an examiner's statement of reasons for patentability and/or confirmation of the claims found patentable in this reexamination proceeding: claims 1-21 are allowed over the art cited with the request. The examiner has considered and found persuasive the arguments that a pump that pumps manure has different requirements than one that pumps water. These arguments were submitted with the response to the first action in reexamination 90/019,076 that stems from the grandparent application of this patent. Further, without impermissible hindsight, there would not be proper motivation to combine a device like Carrier with a device like Puck. Therefore, the examiner has determined that the prior art does not reasonably show an amphibious vehicle that can be mobile on both land and liquid that pumps manure, in combination with the other claimed elements.

EX1038, p. 6.

100. I also understand that the Board, in its Institution Decision, stated "[a]t this stage, and given that both parties agree that liquid manure includes suspended solids, we construe these terms only to the extent that pumping liquid manure requires a pump with a structure that is capable of pumping liquid with suspended solids." Paper 12 at 12. As described herein, it is my opinion that the suspended solids of liquid manure includes 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.

101. 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

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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.

102. 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.

103. 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

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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.

104. 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:

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> 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.

105. 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.

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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.

106. 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.

107. 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 inexperience 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.

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

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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.

109. Dr. Winkel also asserts that "[s]creens and filters are well known for enhancing the manure pumping capabilities of conventional water pumps." EX1004, Winkel Decl. ¶ 105. Dr. Winkel provides no citation in support of this assertion. He goes on to assert that "[s]creens and filters similar to the type described in Carrier have been specifically used for this purpose" and that the "screen provided in Carrier would enhance the ability of the Carrier pump to pump liquid manure." *Id*. Again, Dr. Winkel provides no citation in support of these assertions.

110. However, the exhibits that Dr. Winkel cites indicate that there are issues with using screens or filters when pumping liquid manure. For example, the LMASD Manual indicates that "[i]ntake screens (see figure 3.20) add a ***significant restriction*** to the pumping system." EX1040 at 65 (emphasis added). Additionally, Chapter 12 of the AWMFH states that "[i]ntake restrictions or plugging cause air-pockets (cavitation) by the impeller. This reduces flow and can hasten the impeller wear, especially where high-pressure pumps are used at a high speed." EX1066 at 43. Pump cavitation can cause the pump to not only stop pumping liquid manure, but it can also lead to the failure or breaking of the pump. EX1066 further describes that "[a] screen is most efficient with liquid waste that has few large solids and at low pumping rates." However, as I describe herein, a POSITA would have understood that liquid manure would have a high solids content, would have bedding material therein, and would likely have hard, thick solid crust thereon, often with the crust covering the entire manure lagoon. As such a POSITA would not have considered using a screen when attempting to pump the liquid manure. Additionally, as I describe herein, a POSITA would have understood that "agitation pumps with large capacities are required" for agitating and complete mixing of manure lagoons and that such pumps typically discharge "between 3,000 gallons per minute and 5,000 gallons per minute." EX1040 at 61. With these high flow rates, a POSITA would not have included a screen. Thus, a POSITA would not have included

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a screen with a fluid pump for pumping liquid manure as described in the '425 Patent.

111. In addition to the significant restriction and cavitation risks that arise with the inclusion of screens or filters in liquid manure pumping, the exhibits that Dr. Winkel cites indicate that if a screen is utilized, there are specific requirements for the size and location of the screen. The LMASD Manual also indicates that because of the significant restriction issues, "[f]or optimum pump performance, use wire screens or baskets with mesh one-inch or larger, with a diameter at least five times the suction pipe diameter." EX1040 at 65. Thus, if a screen is used, not only must the mesh size be large ("one-inch or larger"), but the physical size of the entire screen must be large ("at least five times the suction pipe diameter"). Chapter 12 of the AWMFH also describes that if a screened pump inlet is used, it "needs a large screen area with relatively large openings to reduce plugging." EX1066 at 42. Again, because a POSITA would understand that there are issues with utilizing a screen that can be detrimental to pumping liquid manure, Pfost I notes that the "screen area should be ***as large as possible*** to minimize velocities into the screen and ***to eliminate plugging***." EX1041 at 5 (emphasis added). Simply, contrary to Dr. Winkel's unsupported statement, not just any filter or screen can be used for pumping liquid manure.

112. In summary, it is my opinion that a POSITA would not have understood a "fluid pump for pumping liquid manure" to be a mere conventional water pump as suggested by Dr. Winkel. Rather it would have been understood by a POSITA to be a liquid manure pump that is specifically designed to agitate and pump liquid manure and the solids therein.

C. "fluid mover"

113. Dependent claims 7 and 19 of the '425 Patent, recite that "wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." It is my understanding that this claim limitation follows a format that may be construed as a means-plus-function limitation under 35 U.S.C. § 112(f).

114. It is my understanding that the issue of whether or not 35 U.S.C. § 112(f) applies to this claim limitation is a legal question that is based on the following underlying factual

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determinations: (1) whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure, and (2) what structure is disclosed in the specification for performing the claimed function. I am not providing an opinion on the overall legal question of whether this phrase is a means-plus-function limitation, but I have provided my opinion below on underlying factual determinations (1) and (2).

115. With respect to point (1), the term "fluid mover" by itself does not connote any particular structure. Standing alone, a "fluid mover" is any component or system capable of moving fluid, which may be a wide variety of different structures.

116. As a result, it is my opinion that a POSITA would not appreciate any discernable difference between the claim term "wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover" and the term "wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a means for moving fluid." In other words, both phrases would mean the same thing to a POSITA.

117. With respect to point (2), it is my opinion that a POSITA would consider the "valve(s) and fluid nozzle(s)" as the corresponding structure for performing the claimed function of moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating. In particular, the '425 Patent describes that "[c]ooperation between the valves 15 and the plurality of fluid nozzles is used to provide directional control and motive power for the vehicle while floating":

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Valve structure comprising a valve **15** corresponding to each fluid nozzle **11**, **13**, **16**, **17** is also provided. The valves **15** are powered and operable to open or close. The valves **15** may be opened fully or partially to proportion flow between the plurality of fluid nozzles. Cooperation between the valves **15** and the plurality of fluid nozzles is used to provide directional control and motive power for the vehicle while floating. For example, proportioning fluid flow from the right side fluid nozzles **17** to the left side fluid nozzles **16** causes the vehicle to turn to the right will floating. Similarly, fluid flow may be proportioned between the first fluid nozzle **11** and the second fluid nozzles **13** to cause the vehicle to move forward or backward. By rotating the second fluid

EX1001, '425 Patent, col 5, ln. 63 – col. 6, ln. 8.

118. In view of the above excerpt, it is my opinion that a POSITA would identify the following structure as the structure the specification describes for moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating: "valve(s) and fluid nozzle(s)."

X. OVERVIEW OF THE CITED ART

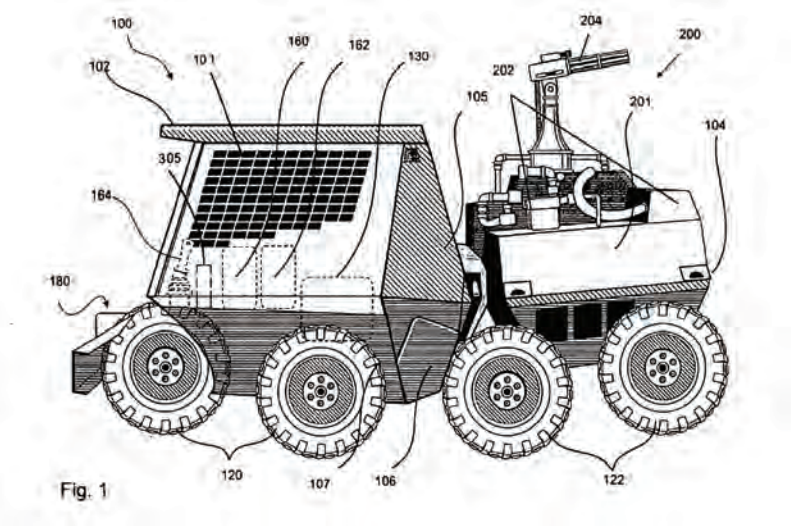
119. In this section I describe the references cited by Petitioner.

A. Carrier [EX1005]

120. Carrier teaches a general-purpose amphibious vehicle having various objectives, none of which are agricultural 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 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

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readily removed from the vehicle through the use of quick-release devices." EX1005, Carrier, ¶ [0060].



121. 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). In summary, a POSITA would have understood Carrier to describe an amphibious emergency or combat vehicle. It is not an amphibious vehicle for pumping liquid manure in a manure lagoon. Carrier does not describe a pump that can pump solids as contained in liquid manure of a manure lagoon.

B. Truxor [EX1006]

122. 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

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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.



123. The vehicle in Truxor 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 minimised [, 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 is a minimal ground pressure vehicle that is designed to travel over sensitive ground, rather than break through ground, such as the thick, heavy crust of manure lagoons. Truxor makes no reference to manure, farm lagoons, or animal husbandry (livestock farming). Truxor also does not describe that any of its onboard controls can be operated by remote control. Truxor does not describe a pump that can pump solids as contained in liquid manure of a manure lagoon.

C. SenwaTec [EX1012]

124. 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

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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.

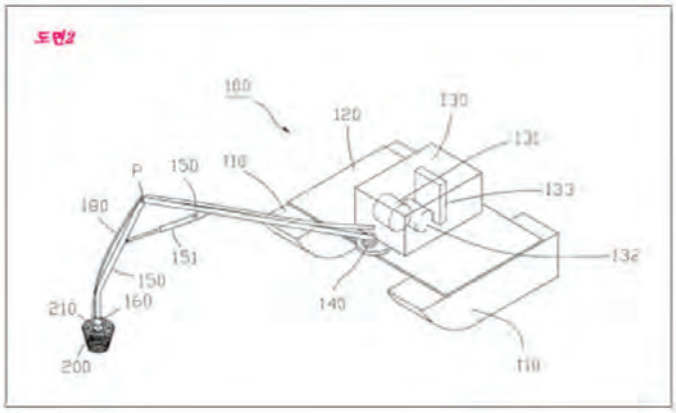
125. The vehicle in SenwaTec is advertised as being designed for weed removal and dredging. EX1012, SenwaTec, p. 1. SenwaTec shows that it has at least 8 different control interfaces. EX1012, SenwaTec, p. 1. However, SenwaTec does not describe that any of its onboard control interfaces can be operated by remote control. Instead, SenwaTec describes that its cockpit has: "Conveniently and comfortably arranged operational control levers for easy operator's reach as well as monitoring instruments in clear view to the operator's position." EX1012, SenwaTec, p. 3. SenwaTec is a "low ground pressure" [EX1012 at 1] vehicle that is designed to travel over sensitive ground, rather than break through ground, such as the thick, heavy crust of manure lagoons. SenwaTec makes no reference to manure, farm lagoons, or animal husbandry (livestock farming). Dr. Winkel asserts that other publications [EX1027 and EX1028] describe that "SenwaTec was used for pumping liquid manure in, for example, manure lagoons as the image shows the Amphi-King vehicle in a 'sewage pond.'" EX1004, Winkel Decl. ¶ 294. As I describe herein, a "sewage pond" is ***not*** a manure lagoon. *See* Section IV. Dr. Winkel again cites to EX1027 for his assertion that the SenwaTec is "being used in manure pumping applications." *See* EX1004,

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Winkel Decl. ¶ 294. Dr. Winkel goes on to quote the article saying that the SenwaTec "drives through the **sewage** pond." *Id*. (quoting EX1027 at 2) (emphasis added). Again, neither of these publications show that the SenwaTec was ever used in a liquid manure lagoon or that its pump is capable of pumping liquid manure. SenwaTec does not describe a pump that can pump solids as contained in liquid manure of a manure lagoon.

D. Yoon [EX1010 and EX1011]

126. Yoon describes a remote-controlled vehicle with an onboard water pump 131:



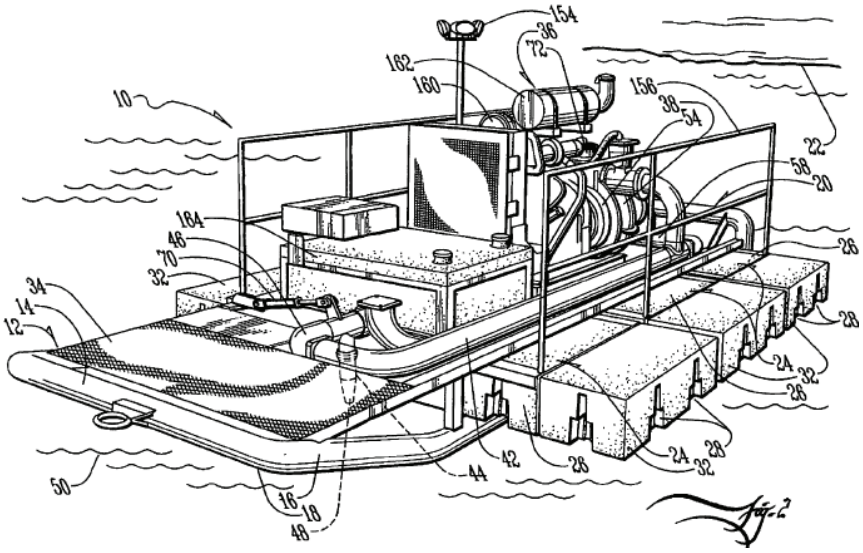
127. Yoon describes that its "invention is about an amphibious water treatment device that is installed at streams or on storage tanks, reservoirs, and so on, into which waste materials are dumped in order to treat industrial waste materials." EX1011, Yoon, ¶ [0001]. Yoon includes a main body 130 in 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

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how its remote control is designed or implemented.

E. Puck [EX1014]

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



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

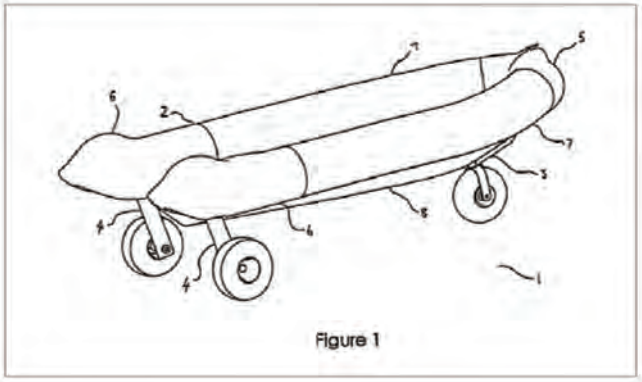
129. Puck describes that its vessel 12 includes modular dock sections 26. EX1014, Puck, Paras. [0022]-[0023]. Puck describes that it includes a slurry pump 38, which is a Cornell Redi-Prime centrifugal pump. EX1014, Puck, ¶ [0025]. Puck describes that the "slurry pump (38) is coupled to a liquid manure 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

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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. Bryham [EX1015]

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



EX1015, Bryham, p. 2.

131. Bryham describes a vee-boat hull with three wheels (one at the bow and two at the stern). 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 make any reference to manure, farm lagoons, or animal husbandry (livestock farming).

G. Bennett-II [EX1017]

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

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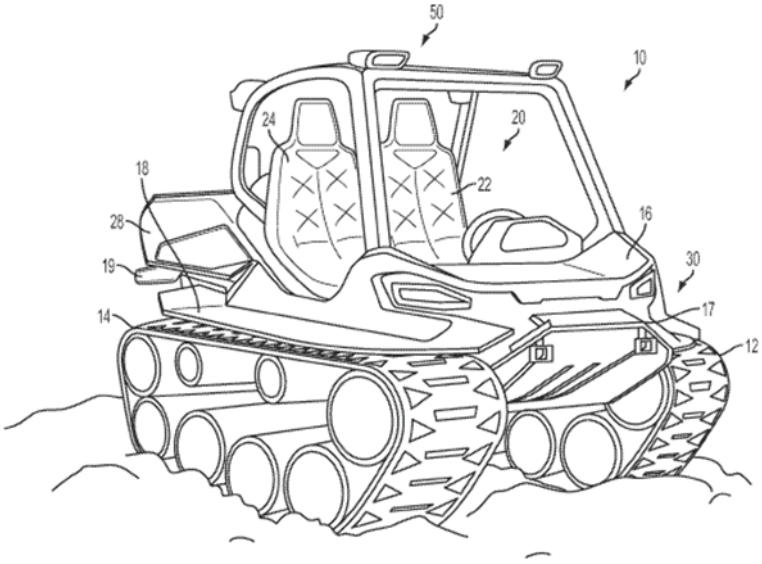


FIG. 1

EX1017, Bennett-II, p. 2.

133. 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:

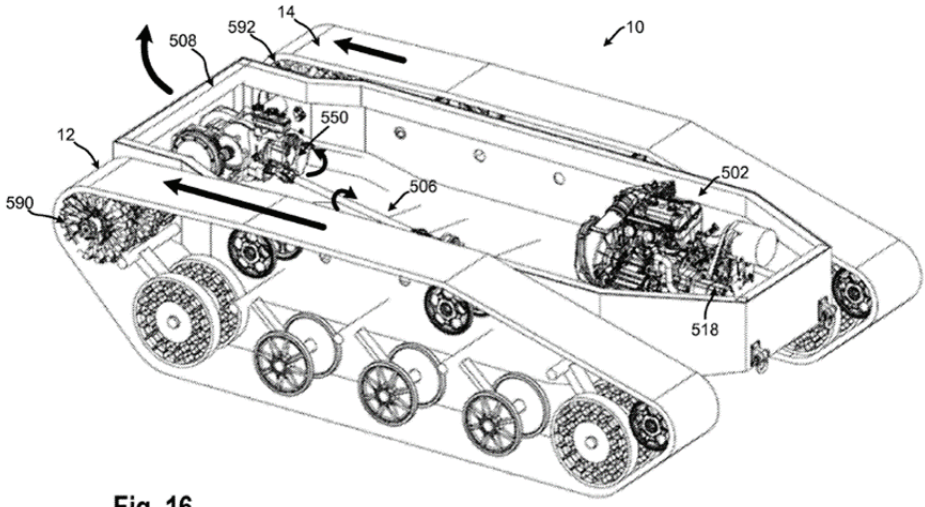


Fig. 16

EX1017, Bennett-II, p. 22, Paras. [0048], [0077].

134. 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

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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).

H. Lyseng [EX1019]

135. Lyseng is an August 29, 2013 article describing the Patent Owner's own commercial embodiment of the patented vehicle, which is shown below:



136. Lyseng does not appear to be prior art to the '425 Patent because it is dated August 29, 2013 – which is ten days **after** the Patent Owner filed its provisional patent application on August 19, 2013.

XI. A POSITA WOULD NOT HAVE BEEN MOTIVATED TO ARRIVE AT THE COMBINATION OF REFERENCES PETITIONER ASSERTS

137. The '425 Patent describes that during storage of liquid manure "a crust can develop on the surface of the pit or lagoon that must be disrupted prior to or during removal of the manure." EX1001, '425 Patent at col. 1, ln.36-38. The '425 Patent describes that "[p]umps are employed for this purpose with jets that return a percentage of the manure back to the pit or lagoon in the form

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of a high volume spray to disrupt the crust and recirculate the manure." *Id*. at col. 1, ln. 38-41. Additionally, the '425 Patent acknowledges that "[p]umps for use in recirculating manure from ***smaller*** pits are known." *Id*. at col. 1, ln. 41-42 (emphasis added). But it recognizes that there are problems with these pumps. Namely, "these pumps are typically suitable for accessing the pit or lagoon from its edge and are connected to a tractor or similar land vehicle for operational power." *Id*. at col. 1, ln. 43-45. Because such pumps are only at the edge of the pit or lagoon, "[t]hey are therefore limited in their ability to recirculate manure to the middle of ***large*** lagoons, which are becoming increasing common as the size of animal husbandry operations increases." *Id*. at col. 1, ln. 45-49 (emphasis added). The '425 Patent therefore identifies that "there is a need for improved pumps and vehicles equipped for pumping, particularly pumps and vehicles suitable for use with large manure lagoons." *Id*. at col. 1, ln. 50-52.

138. Thus, it is my opinion, that a POSITA would have understood from the teachings of the '425 Patent that there are shortcomings with pumps for recirculating smaller pits and that such pumps have difficulties in breaking up the crust suspended on liquid manure and recirculating and agitating the liquid manure of large manure lagoons or pits. Moreover, as described herein, a POSITA would have known that the crust suspended in the liquid manure can be hard, thick, and pose clogging problems if fluid pumps that are not for pumping liquid manure are attempted to be used to for agitating the liquid manure.

139. Therefore, it is my opinion that a POSITA who would have been attempting to solve the same problems at the same time of the invention of the '425 Patent would have never looked to Truxor or SenwaTec in the first instance and therefore would have never modified Truxor or SenwaTec as suggested by Petitioner and Dr. Winkel. Again, Truxor describes a vehicle with "minimal ground pressure" that can be "driven with care" to minimize "damages to river banks and sensitive areas." EX1006 at 2. Truxor goes so far to state that its vehicle is "ideal for working on golf courses, nature reserves and public parks where larger, heavier machines have difficulty operating." *Id*. A POSITA that was particularly interested in breaking up, agitating and

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recirculating the hard, thick crusts in liquid manure of large manure lagoons would have never looked to a Truxor's lightweight vehicle with "minimal ground pressure" that is "sensitive" to the ground on which it is drive. The same goes for SenwaTec, which describes a "light" vehicle with "low ground pressure." EX1012 at 1. This is the exact opposite of what a POSITA would have been looking for. A POSITA would have been keenly aware that Truxor's and SenwaTec's vehicles with their low power, light weight, and low flow rate pumps would be insufficient and outright incapable of solving the problem that they faced.

140. A POSITA would have recognized that Truxor's minimal ground pressure and lightweight vehicle would have difficulties breaking through the crust in the liquid manure and that its small pump would be unable to pump the liquid manure considering the total solids content, the size of the solids, the viscosity of the liquid manure, and the hard, thick crust that it must also pump. Again, a POSITA would have known that the thick solid crust "can become relatively hard and can reach six feet in thickness" and can have a "consistency of dry peat moss." EX2003, col. 1, ln. 46-47; *id*. at col. 1, ln. 26-30. Thus when presented with the problem attempted to be solved by the '425 Patent, a POSITA would have sought out a heavy weight vehicle with a high-powered engine and high output fluid pump for pumping liquid manure that could run for hours at a time as is often required to fully agitate a liquid manure lagoon.

141. Moreover as asserted by Petitioner and Dr. Winkel, a POSITA would have understood that liquid manure lagoon is highly corrosive. *See* EX1004, Winkel Decl. ¶ 120. Dr. Winkel asserts that "[a] POSA would have been motivated to avoid exposing certain types of metal equipment, such as vehicle trailers, to corrosive lagoon liquids." *Id*. He's entirely correct on this point, and for that very reason a POSITA would have never looked to using an amphibious vehicle in a liquid manure lagoon. Thus a POSITA would not have utilized an amphibious vehicle with wheels or tracks that would be in the liquid manure during long periods of agitation and recirculation as they would have believed that such equipment would have been damaged by the corrosive environment. The POSITA would have understood that the ground engaging propulsion

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structure of the amphibious vehicle 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. The repeated and prolonged exposure to the corrosive liquid manure would have quickly corroded the costly components of the ground engaging propulsion structure, such as hydraulic motors, spindles, hydraulic fittings, wheels, etc. A POSITA would have understood that this would lead to significant downtime and costly repairs of the manure lagoon agitator.

142. Additionally, it is my opinion that a POSITA would **not** have modified Truxor or SenwaTec, both of which describe the use of quick-connect attachments, to incorporate remote control systems because a POSITA would have needed a direct line of sight of the terrain ahead of and around the vehicle to avoid getting stuck, rolling, or tipping and to use the particular tool that was attached to the vehicle.

143. For these reasons, a POSITA would have never looked to Truxor or SenwaTec and despite knowing of the existence of amphibious vehicles they would have never thought to modify or use one for agitation and recirculation of liquid manure. If it was so obvious as Dr. Winkel asserts, for a POSITA to have created an amphibious manure lagoon agitation vehicle, then why did a POSITA never do it before Nuhn. The reasons I give are why. Rather than an amphibious vehicle, Puck—filed less than two years before the priority date of the '425 Patent—exemplifies what a POSITA would have done. Rather than subject an amphibious vehicle with its complex and costly components to the corrosive environment of liquid manure, with Puck only the frame 14 of welded tubular steel pipes 16, modular dock sections 26, releasably coupled tapered nozzles 48, 66, 68, and intake pipe 40 are in the liquid manure when Puck's boat is floating in the liquid manure lagoon. *See* EX1014, Fig. 4. No part of the power source 36, liquid manure pump 38, or hydraulic system (e.g., hydraulic cylinder 52 or hydraulic pump 54) are shown as being in the liquid manure when Puck's boat is floating. *See id*. That is because a POSITA would have understood, and did understand, that one would want to keep these complex, costly components out of the liquid manure. Importantly, Puck describes that the modular dock sections 32 and the

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tapered nozzles 48, 66, 68 are removable. As such, these comparatively cheaper components could be removed and replaced much easier and cheaper after prolonged exposure to the liquid manure.

144. In summary, it is my opinion that no POSITA would have ever looked to an amphibious vehicle, including Truxor or SenwaTec, 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 claims of the '425 Patent are obvious.

XII. GROUND 1: CLAIMS 1-21 ARE NOT ANTICIPATED BY CARRIER

145. In the following sections I examine various claim elements of the '425 Patent and explain why at least Claim 1 is not anticipated by Carrier. Claims 2-21 depend from Claim 1 and are not anticipated by Carrier for at least the same reasons, and for the additional reasons provided herein.

A. Claim 1

1. CARRIER FAILS TO DISCLOSE OR SUGGEST A FLUID PUMP FOR PUMPING LIQUID MANURE

146. Carrier unequivocally teaches an amphibious combat or emergency vehicle that can optionally be equipped with various quick-release devices, such as a water pump and water cannon for firefighting:

> **[0060]** Another important feature of the present invention is that the tank, hoses, and pump may be readily removed from the vehicle through the use of quick-release devices. Assuming the water and foam tanks are empty, four firefighters should easily be able to remove the fire-fighting equipment, which would enable the vehicle to be used during a search and rescue. A remote controlled crane can be mounted on the rear of chassis **102** can also be used to facilitate in the removal of any of the aforementioned package components. The back portion, or rear deck, of the vehicle is capable of carrying two injured persons while two emergency personnel ride in the vehicle's passenger area. Consequently, transforming the

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vehicle and enabling it to be used for a different purpose reduces the number of vehicles required and provides greater flexibility to the firefighters, military personnel or other emergency personnel who use the device.

[0061] The use of a pump mounted to the all terrain vehicle which is capable of pumping water from a lake or stream onto a fire is another feature of the present invention. This feature reduces the need to transport water to the site of the fire or, in the alternative, makes it easier to transport water pumping equipment to the body of water to be used infighting the fire.

EX1005, Carrier, ¶ [0060]-[0061]. This optional pump in Carrier is described as "capable of pumping water from a lake or stream." Carrier does not say that the pump has other capabilities or that the pump is capable of pumping manure. Carrier makes zero reference to manure, farm lagoons, or animal husbandry (livestock farming). Similarly, Carrier provides no teaching or suggestion of using its vehicle in agricultural applications, much less the pumping of liquid manure within and out of a manure lagoon.

147. A POSITA would understand that traditional water pumps, like the one disclosed in Carrier, would be prone to clogging in manure pumping applications. This is reflected by statements made by the inventors in the '425 Patent and inventors of other manure agitation equipment. For example, the '425 Patent specification explains that liquid manure includes solid materials that can clog traditional pumps:

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, '425 Patent, col. 3, ln. 14-21. Along the same lines, the Houle reference explains that farm animal manure consists of a liquid with solid particles in suspension that tend to clog traditional pumps:

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Farm animal manure consists of solid particles in a liquid, and the solid particles either settle on the bottom of the container (as in the case of pig manure) or form a crust over the liquid (as in the case of cow manure) depending on the density of the solid matter and, in some cases, both conditions obtain. Thus, the mass of manure in the container must be thoroughly mixed prior to pumping in order to maintain the solid particles in suspension, otherwise only the liquid matter will be pumped out while the solid matter accumulates in the container. Moreover, such solid matter tends to clog the pump.

Hitherto, manure handling pumps consisted of a powerful centrifugal pump disposed near the bottom of the container, the impeller turning about a vertical axis, and a conduit system coupled to the outlet of the pump for either circulating manure within the container or away therefrom into a manure spreader or a different container. The conduit system therefore has a first branch leading out of the container toward another container or toward a tank spreader, and a second branch leading to a suitable nozzle pipe for returning into the container the slurry being mixed. A gate controls the selection of conduit branch in order to either agitate the slurry or pump same out of the reservoir. Examples of such centrifugal systems of which many different designs are currently available from farm equipment manufacturers, are described in U.S. Pat. Nos. 3,905,725 dated Sept. 16, 1975 (R. L. Johnson), 3,446,151, May 27, 1969 (H. G. V. Anderson), 3,456,592, July 22, 1969 (L. L. Nelsen) and 3,966,361, June 29, 1976 (B. L. House). Such devices however provide limited efficiency when the reservoir contains a thick floating crust or heavy bottom sediments. Indeed, the mixing capabilities of centrifugal pump systems are at best limited and time consuming, and no agitation takes place during transfer of the slurry to a different container into a tank spreader. Furthermore, clogging of the pump's impeller and consequential loss of pump efficiency remains a serious shortcoming.

EX2010, U.S. Pat. No. 4,406,413, col. 1, ln. 24-63.

148. As described above, the Depeault reference [EX2003] explained that the upper floating crust in a manure lagoon "can become relatively hard and reach six feet in thickness." EX2003, col. 1, ln. 46-47. Thus as noted by Depault, a POSITA would understand that the water pump of Carrier would in no way be capable of pumping liquid with suspended solids such as the

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hard and deep crust in manure lagoons.

149. A POSITA would also expect Carrier's water pump to have clogging problems if used to pump liquid manure because Carrier discloses a screen for filtering debris that would otherwise clog hoses or the pump:

> **[0063]** The tank **201** can preferably have a recessed top for storage of hoses, multiple 100-foot hoses, and a large fill orifice, a screen to filter debris that would otherwise clog hoses, pump **202** to refill the tank **201** from lakes, ponds, or streams. Additionally, the tank **201** includes a master drain for flushing and cleaning the tank. In addition, a water cannon may be provided with vehicle **100** and located adjacent the operator to enable use thereof.

EX1005, Carrier, ¶ [0063]. A POSITA would understand that this screen in Carrier for filtering debris would quickly become clogged by the suspended solids found within liquid manure, rendering the pump inoperable if used to pump liquid manure. As noted above, when screens are used with manure pumps, specific minimum mesh dimensions and screen sizes should be used in order to reduce clogging of the screen, significant restriction in the flow to the pump, and cavitation of the pump. *See supra* at Section IX.B. Carrier's single reference to a "screen" provides no details of its "screen" and whether it would be of the type and size described as being used with manure pumps. Simply, the inclusion of any generic screen and any generic pump, as described by Carrier, would not suggest to a POSITA that Carrier's pump is capable of pumping liquid manure or even a liquid with suspended solids. Rather, this portion of Carrier's disclosure would suggest to a POSITA that Carrier's pump was ***not*** designed to pump liquid manure and could ***not*** be used to pump liquid manure.

2. CARRIER FAILS TO DISCLOSE ALL OF THE WIRELESS REMOTE CONTROL LIMITATIONS OF CLAIM 1

150. Claim 1 requires "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 fluid pump; (3) control at least one of the speed and direction of

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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." Carrier does not disclose a pump that pumps liquid manure so it follows that Carrier also fails to teach wireless remote control of "a flow of liquid manure from the fluid pump." Carrier's description also does not expressly describe controlling speed and/or direction when the vehicle is floating. Thus, it is my opinion that Carrier does not describe the claimed elements of the wireless remote control.

3. CARRIER FAILS TO DISCLOSE THE CLAIMED COMBINATION OF ELEMENTS, WHICH WHEN CONSIDERED COLLECTIVELY, DEFINE AN AMPHIBIOUS MANURE LAGOON AGITATION VEHICLE

151. As explained above, when the claim elements are considered together as a claimed combination, what is claimed is an amphibious vehicle that is specially adapted for the particular purpose of disrupting the crust and recirculating liquid manure in a manure lagoon, where the vehicle can drive into, out of, and navigate the manure lagoon by wireless remote control. Carrier fails to disclose such a vehicle.

B. Claim 2

152. Claim 2 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump." As described above Carrier does not anticipate Claim 1. Claim 2 is not anticipated by Carrier at least because of its dependence on Claim 1.

C. Claim 3

153. Claim 3 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the conduit comprises an opening at an end thereof." As described above Carrier does not anticipate Claims 1 and 2. Claim 3 is not anticipated by Carrier at least because of its dependence on Claims 1 and 2.

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D. Claim 4

154. Claim 4 depends from Claim 3 and recites: "The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening.." As described above Carrier does not anticipate Claims 1, 2, and 3. Claim 4 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, and 3.

E. Claim 5

155. Claim 5 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above Carrier does not anticipate Claims 1, 2, 3, and 4. Claim 5 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, and 4.

F. Claim 6

156. Claim 6 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above Carrier does not anticipate Claims 1 and 2. Claim 6 is not anticipated by Carrier at least because of its dependence on Claims 1 and 2.

G. Claim 7

157. Claim 7 depends from Claim 1 and recites "wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." As described above Carrier does not anticipate Claim 1. Claim 7 is not anticipated by Carrier at least because of its dependence on Claim 1.

158. Carrier does not teach that its single fire-fighting water canon can be used to control the speed and/or direction of the vehicle while it is floating. There is no disclosure in Carrier that its pump and water cannon are powerful enough to overcome drag to propel or maneuver the Carrier vehicle while it is in water.

159. Dr. Winkel asserts that a POSITA would have understood that the operation of the

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water cannon of Carrier "is the same principle of operation that is used to control the speed or direction of jet boats." EX1004, ¶ 232. However, Dr. Winkel provides no technical reasoning or support for how the water cannon of Carrier would operate the same as jet boats.

160. This statement is also counter-intuitive. Carrier describes that its firefighting equipment 200 is to be used fighting fires (*see* EX1005 at ¶¶ [0050], [0059]). If the pump 202 of the firefighting equipment 200 was strong enough to move the vehicle of Carrier, then the vehicle would be continually moving away from the fire it was attempting to fight. This would significantly impede or eliminate Carrier's ability to fight fires. Thus, a POSITA would not have understood the firefighting equipment 200 of Carrier to be able to control the speed and direction of the vehicle while it is floating. Moreover, as liquid manure has significantly higher solids content and often crust floating therein, a POSITA would not have understood Carrier as describing that its firefighting equipment 200 could control the speed and direction of its vehicle while floating in liquid manure.

161. Dr. Winkel also suggests that Carrier's wheels can propel or change the direction Carrier's vehicle while it is floating. Other than pointing to paragraphs [0045] and [0055] of Carrier in alleging that Carrier's wheels "can be independently controlled to rotate," Dr. Winkel cites to nothing in Carrier that describes that its wheels are able to control at least one of speed and direction of the vehicle when the vehicle is floating. Paragraphs [0045] and [0055] of Carrier do not describe operation of Carrier's vehicle in water or that speed and direction of the vehicle are controlled by operating the wheels while in water. Instead, paragraph [0055] describes exclusively land-based steering. *See* EX1005 at ¶ [0055] (describing placing vehicle 100 "into a ***highway mode*** of steering like that of an automobile on standard ***paved and unpaved road networks*** and then changed to skid steer type steering or counter rotation steering for greater steering mobility when needed as in combat escape and evade or weapons set up and deploy maneuvers, rough ***terrain*** or congested areas such as ***city streets*** enabling all vehicles to turn within the length of its own radius.") (emphasis added).

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162. I have also considered whether Carrier meets all of the limitations of Claim 7 if the language reciting "fluid mover" is construed as a means-plus-function claim limitation. Under that construction, it is my opinion that Carrier fails to disclose the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating."

163. As explained above, the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating" is: "valve(s) and fluid nozzle(s)." Specifically, the '425 Patent describes that proportioning the fluid flow from the nozzles can be used to control movement of the vehicle while floating:

Valve structure comprising a valve **15** corresponding to each fluid nozzle **11**, **13**, **16**, **17** is also provided. The valves **15** are powered and operable to open or close. The valves **15** may be opened fully or partially to proportion flow between the plurality of fluid nozzles. Cooperation between the valves **15** and the plurality of fluid nozzles is used to provide directional control and motive power for the vehicle while floating. For example, proportioning fluid flow from the right side fluid nozzles **17** to the left side fluid nozzles **16** causes the vehicle to turn to the right will floating. Similarly, fluid flow may be proportioned between the first fluid nozzle **11** and the second fluid nozzles **13** to cause the vehicle to move forward or backward. By rotating the second fluid

EX1001, '425 Patent, col 5, ln. 63 – col. 6, ln. 8.

164. Carrier fails to describe any valve connected to the "nozzles 204" of the firefighting equipment 200. Carrier fails to describe any control of valves to provide proportional flow between nozzles to control the vehicle. And Carrier does not teach or describe in any way that its "nozzles 204" of the firefighting equipment 200 are capable of performing the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating."

165. Thus, it is my opinion that Carrier does not anticipate Claim 7.

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H. Claim 8

166. Claim 8 depends from Claim 1 and recites "further comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above Carrier does not anticipate Claim 1. Claim 8 is not anticipated by Carrier at least because of its dependence on Claim 1.

I. Claim 9

167. Claim 9 depends from Claim 8 and recites "wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." As described above Carrier does not anticipate Claims 1 and 8. Claim 9 is not anticipated by Carrier at least because of its dependence on Claims 1 and 8.

168. At least the same reasons as described with respect to Claim 7, Carrier does not describe "wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." As noted above with respect to Claim 7, Carrier does not describe that the firefighting equipment 200 is capable of controlling the speed and direction of Carrier's vehicle. As such, even if Carrier's firefighting equipment 200 were remote controlled to control the orientation of the firefighting equipment 200, Carrier still does not describe Claim 9.

J. Claim 10

169. Claim 10 depends from Claim 4 and recites: "The vehicle of claim 4, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above Carrier does not anticipate Claims 1, 2, 3, and 4. Claim 10 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, and 4.

K. Claim 11

170. Claim 11 depends from Claim 10 and recites "wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and

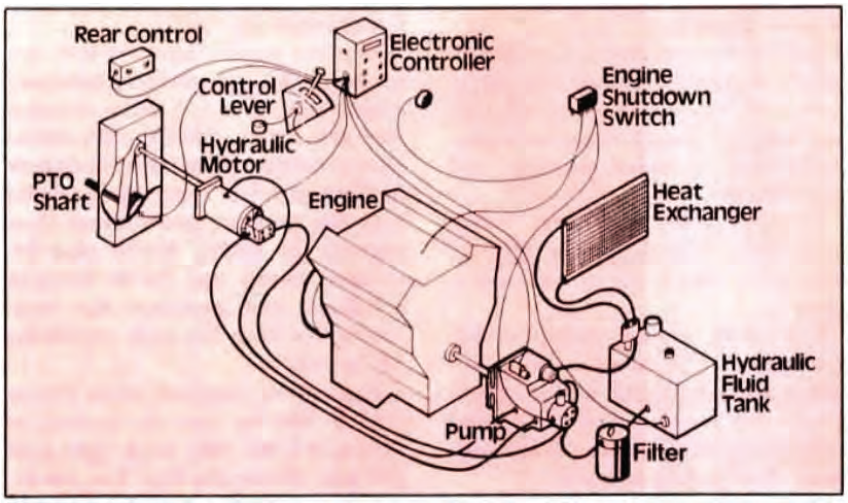
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direction of the vehicle when the vehicle is floating." At least the same reasons as described with respect to Claims 7 and 9, Carrier does not describe "wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." As described above Carrier does not anticipate Claims 1, 2, 3, 4, and 10. Claim 11 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, and 10.

L. Claim 12

171. Claim 12 depends from Claim 4 and recites "wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive." As described above Carrier does not anticipate Claims 1, 2, 3, and 4. Claim 12 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, and 4.

172. Dr. Winkel states that a "hydrostatic PTO is a mechanical drive between the fluid pump and the engine." EX1004, ¶ 241. Contrary to Dr. Winkel, a "hydrostatic PTO" is not a mechanical drive that is connected to both the power source and the fluid pump. A hydrostatic PTO utilizes a hydrostatic transmission to remotely drive a PTO shaft thus allowing the PTO to run at variable speeds independent of its prime mover and can even be operated in a direction opposite of the prime mover:



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EX2034 at 18, *Hydrostatic Pto's Run in Reverse*, FARM SHOW, Vol. 1 No. 5, 1977 at 18. A POSITA would have understood that with a hydrostatic PTO, there is a hydraulic connection between the prime mover and the PTO, **not** a mechanical connection.

173. Thus, Carrier does not describe "wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive."

M. Claim 13

174. Claim 13 depends from Claim 12 and recites: "The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed." As described above Carrier does not anticipate Claims 1, 2, 3, 4, and 12. Claim 13 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, and 12.

N. Claim 14

175. Claim 14 depends from Claim 13 and recites: "The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels." As described above Carrier does not anticipate Claims 1, 2, 3, 4, 12, and 13. Claim 14 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, 12, and 13.

O. Claim 15

176. Claim 15 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the ground engaging propulsion structure comprises at least two powered wheels." As described above Carrier does not anticipate Claims 1, 2, 3, 4, 12, 13, and 14. Claim 15 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

P. Claim 16

177. Claim 16 depends from Claim 14 and recites "wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at

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variable speed." As described above Carrier does not anticipate Claims 1, 2, 3, 4, 12, 13, and 14. Claim 16 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

Q. Claim 17

178. Claim 17 depends from Claim 16 and recites "wherein the wheels are operable at variable speed by the hydraulic motor." As described above Carrier does not anticipate Claims 1, 2, 3, 4, 12, 13, 14, and 16. Claim 17 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, and 16.

R. Claim 18

179. Claim 18 depends from Claim 17 and recites "wherein the vehicle further comprises a nozzle at the end of the conduit." As described above Carrier does not anticipate Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17. Claim 18 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

S. Claim 19

180. Claim 19 depends from Claim 17 and recites "wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." At least the same reasons as described with respect to Claim 7, Carrier does not describe "wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." Additionally, as described above, Carrier does not anticipate Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17. Claim 19 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

T. Claim 20

181. Claim 20 depends from Claim 17 and recites "further comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above, Carrier does not anticipate

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Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17. Claim 20 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

U. Claim 21

182. Claim 21 depends from Claim 20 and recites "wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." At least the same reasons as described with respect to Claims 7, 9, and 11, Carrier does not describe "wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." Additionally, as described above, Carrier does not anticipate Claims 1, 2, 3, 4, 12, 13, 14, 16, 17, and 20. Claim 21 is not anticipated by Carrier at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, 17, and 20.

XIII. GROUND 2: CLAIMS 1-7 AND 12-19 ARE NOT OBVIOUS BASED ON TRUXOR IN VIEW OF YOON OR CARRIER

183. In the following sections I examine various claim elements of the '425 Patent and explain why at least Claim 1 is not rendered obvious by Truxor in view of Yoon or Carrier ("the Truxor Combination"). Claims 2-7 and 12-19 depend from Claim 1 and are not rendered obvious by the Truxor Combination at least the same reasons. It is my understating that in its institution decision, the Board considers Truxor to be EX1006 only. Paper 12, at 13. For the reasons set forth in Section XI, it is my opinion that a POSITA would not have been motivated to seek out Truxor and combine it with Yoon or Carrier to arrive at the claims of the '425 Patent.

A. Claim 1

1. THE TRUXOR COMBINATION FAILS TO DISCLOSE OR SUGGEST A FLUID PUMP FOR PUMPING LIQUID MANURE

184. Truxor discloses an amphibious vehicle that is designed to carry an onboard operator and a number of different tool attachments, including aquatic weed cutters [EX1006, pp.

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6-7], rakes [EX1006, pp. 8-9], buckets and log grabbers [EX1006, p. 9], dredge pumps [EX1006, pp. 10-11], excavators [EX1006, p. 12], cultivators [EX1006, p. 13], and oil decontamination tools [EX1006, pp. 14-15].

185. Truxor does not teach or even suggest that the Truxor vehicle and one of its pump attachments are used to pump manure.

186. Instead, Truxor's documentation clearly states that the Doro pump is designed for pumping light sediments and volatile sand:

The Doro Pump

Page 18

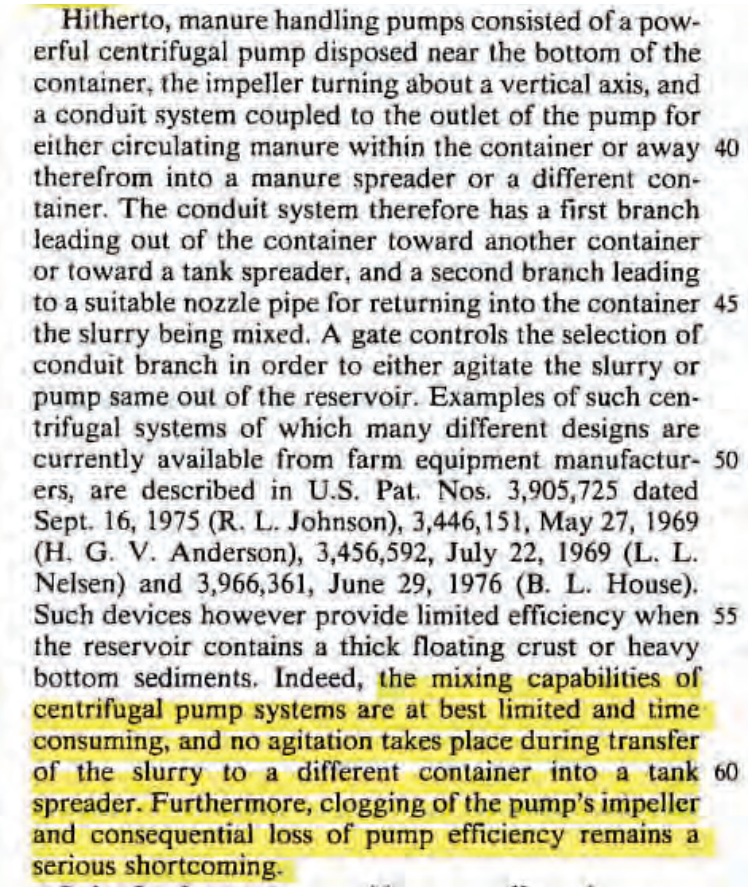
The Doro pump is designed for pumping light sediments and volatile sand. The Doro pump is supplied with a screw feed. The intake can be equipped with a suction nozzle when pumping sand or light floating sediments.

EX1007, Arnoldsson, p. 123.

187. A POSITA would not take this statement that "[t]he Doro pump is designed for pumping light sediments and volatile sand" to mean that the Doro pump would not be prone to clogging in manure pumping applications. Indeed, the Houle reference explains that even powerful centrifugal pumps are prone to clogging when used to pump manure and explains that "[s]uch devices … provide limited efficiency when the reservoir contains a thick floating crust or heavy bottom sediments":

Farm animal manure consists of solid particles in a liquid, and the solid particles either settle on the bottom of the container (as in the case of pig manure) or form a crust over the liquid (as in the case of cow manure) depending on the density of the solid matter and, in some cases, both conditions obtain. Thus, the mass of manure in the container must be thoroughly mixed prior to pumping in order to maintain the solid particles in suspension, otherwise only the liquid matter will be pumped out while the solid matter accumulates in the container. Moreover, such solid matter tends to clog the pump.

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Hitherto, manure handling pumps consisted of a powerful centrifugal pump disposed near the bottom of the container, the impeller turning about a vertical axis, and a conduit system coupled to the outlet of the pump for either circulating manure within the container or away therefrom into a manure spreader or a different container. The conduit system therefore has a first branch leading out of the container toward another container or toward a tank spreader, and a second branch leading to a suitable nozzle pipe for returning into the container the slurry being mixed. A gate controls the selection of conduit branch in order to either agitate the slurry or pump same out of the reservoir. Examples of such centrifugal systems of which many different designs are currently available from farm equipment manufacturers, are described in U.S. Pat. Nos. 3,905,725 dated Sept. 16, 1975 (R. L. Johnson), 3,446,151, May 27, 1969 (H. G. V. Anderson), 3,456,592, July 22, 1969 (L. L. Nelsen) and 3,966,361, June 29, 1976 (B. L. House). Such devices however provide limited efficiency when the reservoir contains a thick floating crust or heavy bottom sediments. Indeed, the mixing capabilities of centrifugal pump systems are at best limited and time consuming, and no agitation takes place during transfer of the slurry to a different container into a tank spreader. Furthermore, clogging of the pump's impeller and consequential loss of pump efficiency remains a serious shortcoming.

EX2010, U.S. Pat. No. 4,406,413, col. 1, ln. 24-63.

188. Dr. Winkel asserts that the Doro pump described in Truxor [EX1006] is capable of pumping liquid manure and that it has capabilities that are "far greater than those necessary for pumping liquid manure." However, Dr. Winkel provides no analysis of the Doro pump beyond this conclusory statement. And while Dr. Winkel states that dredging pumps have been used for pumping liquid manure and cites to EX1058, he provides no analysis or opinion that the Doro pump shown in Truxor [EX1006] is a dredging pump like that referred to in EX1058. For example, he does not conduct any analysis of the tolerances, pumping head, pumping capacity, power capacities, or other characteristics of the Duro pump nor does he make any comparison of such characteristics to manure pumps or the dredging pump referred to in EX1058. Without providing any analysis of whether the Duro pump of Truxor [EX1006] is structurally similar to the dredging pump referred to in EX1058 or any other manure pump, Dr. Winkel has failed to support his

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assertion that the Doro pump is capable of pumping liquid manure.

189. As described herein, a POSITA would understand that liquid manure has high total solids content, behaves like a non-Newtonian fluid, and, prior to being agitated, often has large, hard, and thick crust floating thereon, as well as abrasive bedding solids therein. *See supra* Section IX.A. There is nothing in Truxor [EX1006] that describes or suggests that its pump is capable of pumping the hard thick crusts that a POSITA would have understood to be in the liquid manure prior to agitation. For these reasons, it is my opinion that a POSITA would not have understood Truxor to describe a pump that is capable of pumping liquid manure with the suspended solids that are routinely encountered therein.

190. In view of this background knowledge and the fact that the Truxor reference itself does not teach that the Doro pump is designed and used to pump manure, a POSITA would not consider the Doro pump to be a "fluid pump for pumping liquid manure" as required by the claims.

2. THE TRUXOR COMBINATION FAILS TO DISCLOSE ALL OF THE WIRELESS REMOTE CONTROL LIMITATIONS OF CLAIM 1

191. Claim 1 requires "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 fluid 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." As explained above, Truxor does not disclose a pump that pumps liquid manure so it follows that the Truxor Combination also fails to teach wireless remote control of "a flow of liquid manure from the fluid pump."

3. THE TRUXOR COMBINATION FAILS TO DISCLOSE THE CLAIMED COMBINATION OF ELEMENTS, WHICH WHEN CONSIDERED COLLECTIVELY, DEFINE AN AMPHIBIOUS MANURE LAGOON AGITATION VEHICLE

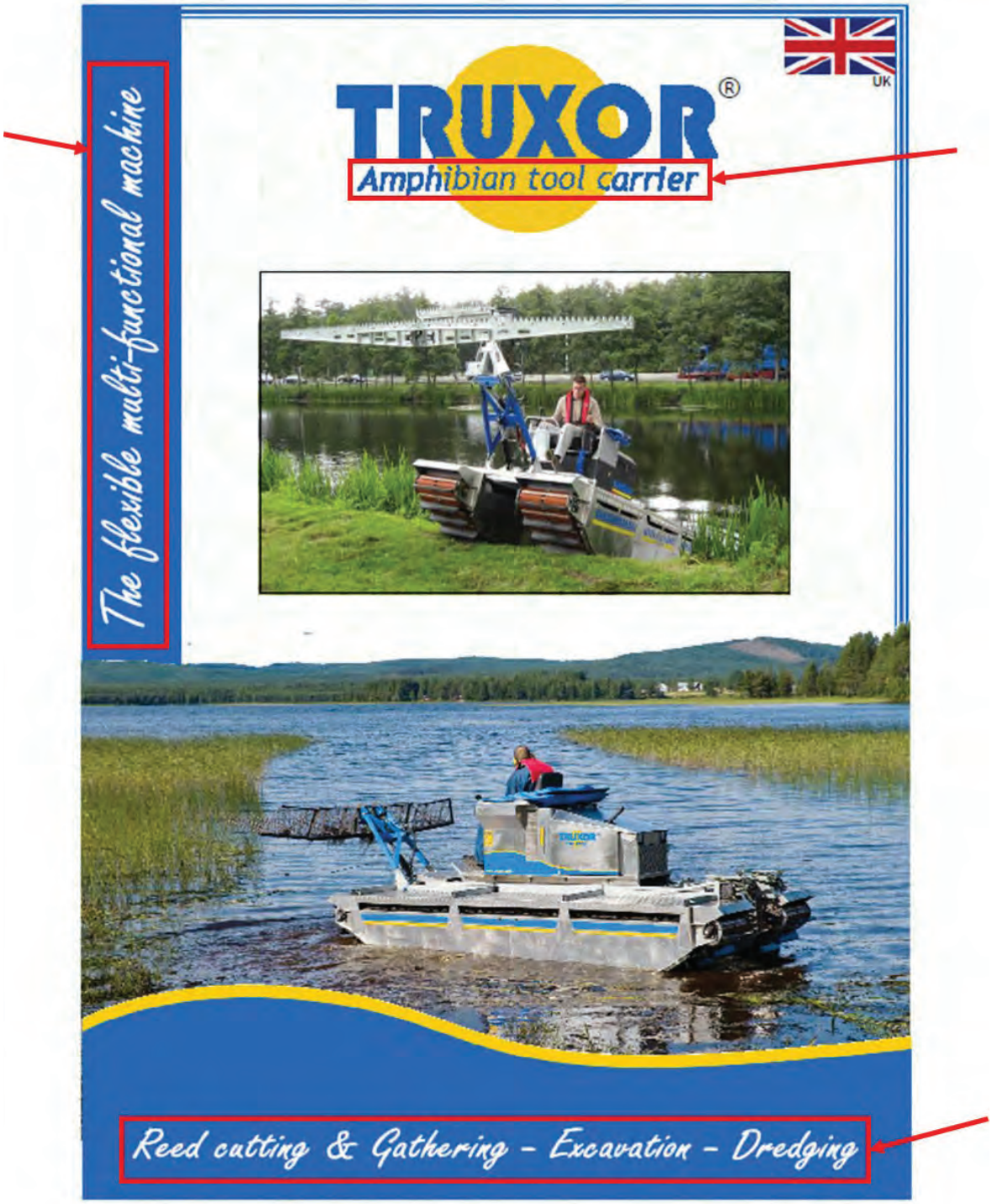
192. As explained above, when the claim elements are considered together as a claimed combination, what is claimed is an amphibious vehicle that is specially adapted for the particular

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purpose of disrupting the crust and recirculating liquid manure in a manure lagoon, where the vehicle can drive into, out of, and navigate the manure lagoon by wireless remote control.

193. The Truxor marketing brochure [EX1006] does not convey to a POSITA a vehicle that pumps manure. Instead, the Truxor marketing brochure [EX1006] describes a manned amphibious vehicle for "Reed cutting & Gathering – Excavation – Dredging":

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EX1006, Truxor, p. 1.

194. If a POSITA were to even make a combination of Truxor with Yoon or Carrier, the result would be an amphibious remote-controlled weed clearing and dredging vehicle – not an

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amphibious manure lagoon pumping/agitation vehicle.

4. A POSITA WOULD NOT HAVE HAD A REASONABLE EXPECTATION OF SUCCESS IN COMBINING TRUXOR WITH YOON OR CARRIER

195. The amphibious vehicle disclosed in Truxor and its tool attachments are designed to be operated by an on-board operator. As a result, Truxor fails to teach the limitations of Claim 1 that recite "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 fluid 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."

196. With respect to Ground 2, Dr. Winkel asserts that a POSITA would **add** wireless remote-control functionality to the amphibious vehicle disclosed in Truxor in view of the remote-control teachings of Yoon or Carrier; however, in my opinion a POSITA would not have been motivated to combine the remote-control teachings of Yoon or Carrier with Truxor, and even if so, would not have had a reasonable expectation of success in making this combination and achieving the claimed invention.

197. It is my opinion that a POSITA would not have been motivated to combine the remote-control teachings of Yoon or Carrier with Truxor to arrive at the claimed invention. Truxor is described as able to be configured as a dredging vehicle with a dredging pump. *See* EX1006 at 10. A POSITA would understand that dredge pumps are used to clean out the bottom of a pond, river, lake or other body of water by removing material from the bottom of the body of water. This is usually done to increase the depth of a particular of the body of water. A POSITA would not have been motivated to remove the human on-board operator from Truxor because in doing so, the ability of the human on-board operator to sense or feel that the bottom of the body of water was sufficiently dredged would have been severely hindered. When an operator is on-board the vehicle of Truxor, they would be able to feel whether the impediment that they are trying to remove by

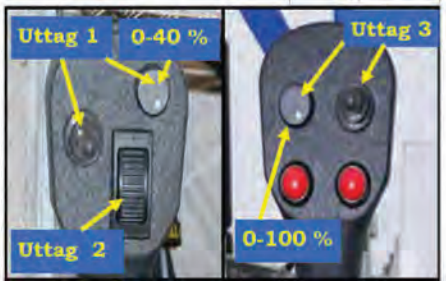
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dredging has been sufficiently removed by resistance to movement of the dredge pump or the vehicle of Truxor as a whole. Removing the on-board operator from Truxor and replacing that on-board operator with a remote control system would entirely remove that tactile feel provided by being physically on the vehicle of Truxor.

198. Moreover, it is my opinion that a POSITA would not have had a reasonable expectation of success in combining the remote-control teachings of Yoon or Carrier with Truxor. Truxor discloses two multi-function joysticks that are used to control the positioning and operation of the submersed pump:

The Doro Pump

The Doro pump is regulated with the help of crossbar switches. The left joystick adjusts the screw feed = socket 1. The rotation can be max. 40 %. The upward and downward movement of the telescope extension is controlled using socket 2 (accessory). The right joystick with socket 3 regulates the rotation speed of the pump, which can be 100 % in most cases.



EX1007, Arnoldsson Decl., p. 126.

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The digging arm may only be moved laterally when the outriggers touch the bottom. The lateral scope of the digging arm with a mounted Doro pump is 4 metres but for safety reasons only a 2-metre range can be used. This means that the permissible working width from the centre is 2 metres in each direction.

Warning! There is a tilting risk if the maximum range is used.



Hydraulic-driven tools mounted on Doro Digger require different oil flows.

Socket 3 that determines the oil flow/pressure to the tools is regulated using the right joystick. The switch (1) controls on/off/back.

The knob (2) adjusts the oil flow. Turn the control clockwise to end position for maximum oil flow (100%).

The rotation speed of the diesel motor also affects the maximum flow of the hydraulic pump. Higher rotation speed is required when many hydraulic functions are running at the same time.

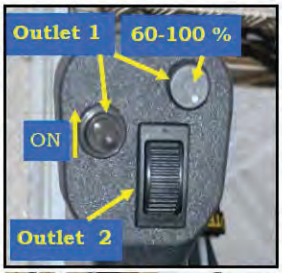
Recommended oil flows for the different tools (2):

Doro Pump V3 80-100 %

Slaghack Orsi 80-100 %

Doro Cutter ESM 1900 40-60 %

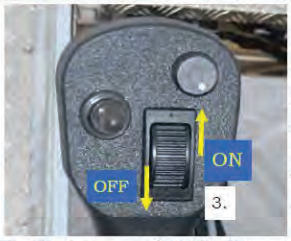
Doro Mill 50-70 %





The controls on the left joystick regulates the oil flow to Doro Digger. The toggle switch activates the oil supply and the knob regulates the oil flow. Turning the control counter-clockwise reduces the oil flow so that the speed of the swing cylinders decreases (1). Recommended setting (60-100%)







Socket 2 adjusts the feed to the pump intake (2). When socket 2 is used, the switch (4) on the panel must be in ON position to achive the hold function. When the roll switch (3) is moved upwards, the feed wheel will start (2). To stop the wheel, pull the roll switch downwards.

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EX1007, Arnoldsson Decl., pp. 128-129.

199. The difficulties with converting hydraulic controls of this type to wireless remote control would be known to a POSITA. Teleoperation is a term often used when a machine or robot is operated from a distance (aka remote control). The difficulties of operating an excavator-like machine system in a teleoperation type environment lie from delay (latency) in controls, lack of tactile feedback (which is provided through onboard hydraulic controls), and an overload of visual information. EX2028, pp. 1, 4-6. The human machine interface (HMI) of hydraulic excavator controls has not evolved much in the last couple of decades and therefore does not lend itself to easily being converted to teleoperation. EX2025, p. 3. In the 2013-2014 time period, commentators explained that further studies and development was needed to convert these types of manual excavator-like controls to wireless remote-control. EX2025, p. 8. Further, ASME papers show this was still an area requiring further development and new control systems in 2022. EX2028, pp. 1-2, 4-6.

200. Dr. Winkel has not shown or even attempted to explain how remote control over the various functions of the Truxor vehicle and Doro Pump could be implemented, how a POSITA could overcome these difficulties when making the Truxor Combination, or that the resulting combination would actually work in the manure lagoon environment.

201. Even today, some ten years later, there is no evidence that a remote-control option has been added to the Truxor vehicle. On October 1, 2023, I visited the Truxor website at https://truxor.com. I was unable to find any reference to any features or options that indicated remote control of their vehicles is available as an option for their products.

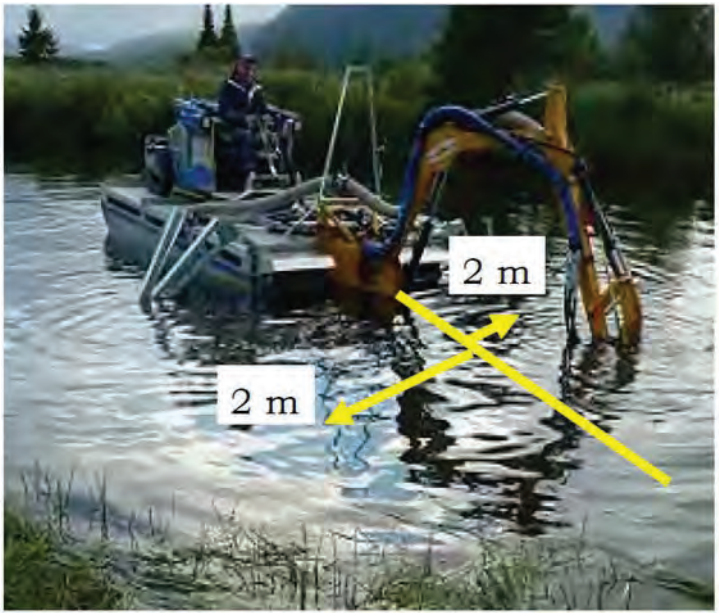
202. On October 2, 2023, I took screenshots from the Truxor website and compiled them as EX2026. I therefore certify that the screenshots shown in EX2026 are true and correct images of the Truxor website identified in the paragraph above. The fact that Truxor has not, to this day, added a remote control option to its vehicles provides evidence that this would not be a simple feat that could be accomplished by routine experimentation.

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203. A POSITA would also expect that remotely controlling the positioning and operation of a submerged pump to be problematic given the difficulty observing its operation from a remote location.

204. Truxor's elevated seating position demonstrates the importance of visual observation of the pump located at the end of Truxor's boom arm:





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EX1007, Arnoldsson Decl., pp. 60, 128.

205. The vehicle disclosed in SenwaTec is similar to the vehicle disclosed in Truxor, but has a seating position that is below the top deck of the vehicle. As a result, operators of the SenwaTec vehicle were forced to stand to get a better view of the submersed pump:



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EX1012, SenwaTec, p. 2. This reinforces what a POSITA would readily appreciate – it would be difficult if not impossible to control and operate this type of vehicle and pump from a remote location.

206. Truxor's operator's manual also warns of known "a tilting risk." EX1007, Arnoldsson Decl., p. 128. Dr. Winkel even acknowledges that the vehicle disclosed in Truxor has a tilting (i.e., rollover) risk:

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Potential Rollover Risk EX1006, 5; *see also* EX1021-EX1022, 1; EX1023, 8.	**Cold Weather/Hypothermia** EX1006, 6.
	

EX1004, Winkel Decl., p. 142.

207. This tilting risk would dissuade a POSITA from adding remote control functionality to Truxor 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. Dr. Winkel completely overlooks Truxor's known instability problem from a reasonable expectation of success standpoint.

208. Manure lagoons typically have steep embankments that can be covered in manure, mud, sand, and/or ice and are therefore extremely slippery. EX1004, Winkel Decl., ¶¶334, 336. A POSITA would recognize that Truxor's known instability issues would be exacerbated by remote control. As a result, a POSITA would not have had a reasonable expectation that adding remote control functionality to Truxor would be successful in producing an amphibious remote-

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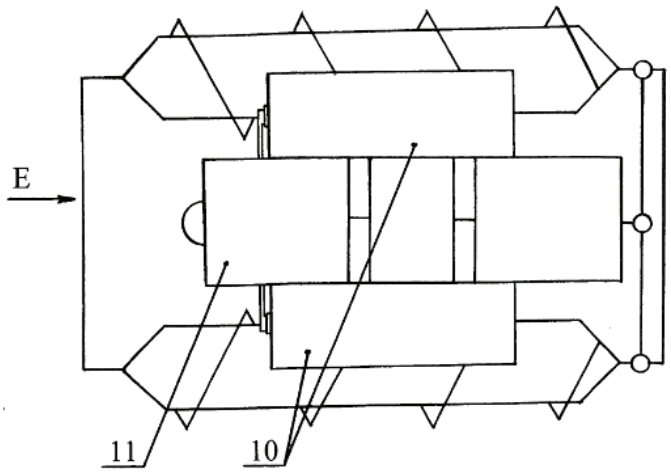
controlled vehicle that could operate in a manure lagoon environment without tipping.

209. The reliance on Melnikov by Dr. Winkel is also misplaced. Melnikov actually supports my opinion that a POSITA would not have had a reasonable expectation of success in adding wireless remote-control functionality to Truxor because that is not what Melnikov did.

210. Melnikov discusses Truxor in its "Background" section as prior art and notes the drawback that it requires an onboard operator:

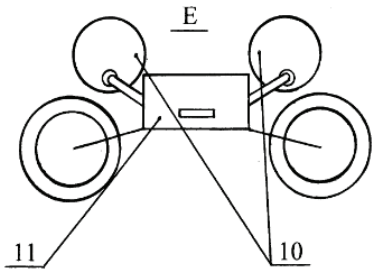
> Truxor — a multifunctional amphibian machine manufactured by the Swedish company *Dorotea Mekaniska AB* is known (www.doroteamekaniska.se). The amphibian is a pontoon machine on caterpillar tracks operated by one operator. On the machine, an oil skimmer, cultivator, excavator, rakes may be quickly mounted as hydraulic attachments. The machine is easily placed on a trailer, which makes it mobile and reduces transport costs. However, the disadvantages of the machine may include the presence of an operator located on the machine itself, which limits the use thereof in conditions dangerous for humans.

EX1025, Melnikov Trans., p. 4. Significantly, Melnikov does not suggest adding remote control to Truxor. Instead of doing that, Melnikov designed a radically different remote-controlled vehicle with a dual-screw propulsion system that looks nothing like Truxor:



Фиг. 11

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Фиг. 12

EX1024, Melnikov, p 7.

211. These major differences continue with Melnikov's pump, which is illustrated as an **onboard** pump for pumping liquid biopreparations and mineral fertilizers from the containers 10 to the spray system 11:

> The machine for applying liquid biopreparations and liquid mineral fertilizers includes containers 10 and a pump with a spray system 11 (Fig. 11) mounted on the carrier vehicle.

EX1025, Melnikov Trans., p. 5.

212. The device in Melnikov does not pose the same problem as the Truxor Combination, where controlling the positioning and operation of a submerged pump would be problematic given the complexity of the controls and difficulty observing its operation from a remote location.

213. Melnikov clearly knew of the Truxor vehicle and clearly knew that its requirement for an onboard operator was a drawback. If it were both obvious and reasonably feasible to add remote control functionality to Truxor, that is precisely what Melnikov would have done. But Melnikov didn't do that and instead created a device that would be far simpler to operate as a remote-control vehicle.

214. A POSITA would understand that just because *some* vehicles can be remote controlled does not mean that *all* vehicles can be remote controlled. Thus, in my opinion, a POSITA would not have had a reasonable expectation of successfully adding remote-control functionality to Truxor to produce an amphibious remote-controlled vehicle that could operate in a manure lagoon environment without tipping.

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B. Claim 2

215. Claim 2 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump." As described above, the combination of Truxor and Yoon or Carrier does not render Claim 1 obvious. Claim 2 is not obvious at least because of its dependence on Claim 1.

C. Claim 3

216. Claim 3 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the conduit comprises an opening at an end thereof." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1 and 2 obvious. Claim 3 is not obvious at least because of its dependence on Claims 1 and 2.

D. Claim 4

217. Claim 4 depends from Claim 3 and recites: "The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, and 3 obvious. Claim 4 is not obvious at least because of its dependence on Claims 1, 2, and 3.

E. Claim 5

218. Claim 5 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, and 4 obvious. Claim 5 is not obvious at least because of its dependence on Claims 1, 2, 3, and 4.

F. Claim 6

219. Claim 6 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1 and 2 obvious. Claim 6 is not obvious at least because of its dependence on Claims 1 and 2.

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G. Claim 7

220. Claim 7 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." As described above, the combination of Truxor and Yoon or Carrier does not render Claim 1 obvious. Claim 7 is not obvious at least because of its dependence on Claim 1.

221. I have also considered whether the combination of Truxor and Yoon or Carrier meets all of the limitations of Claim 7 if the language reciting "fluid mover" is construed as a means-plus-function claim limitation. Under that construction, it is my opinion that the Truxor Combination fails to disclose the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating."

222. As explained above, the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating" is: "valve(s) and fluid nozzle(s)." Specifically, the '425 Patent describes that proportioning the fluid flow from the nozzles can be used to control movement of the vehicle while floating:

Valve structure comprising a valve **15** corresponding to each fluid nozzle **11**, **13**, **16**, **17** is also provided. The valves **15** are powered and operable to open or close. The valves **15** may be opened fully or partially to proportion flow between the plurality of fluid nozzles. Cooperation between the valves **15** and the plurality of fluid nozzles is used to provide directional control and motive power for the vehicle while floating. For example, proportioning fluid flow from the right side fluid nozzles **17** to the left side fluid nozzles **16** causes the vehicle to turn to the right will floating. Similarly, fluid flow may be proportioned between the first fluid nozzle **11** and the second fluid nozzles **13** to cause the vehicle to move forward or backward. By rotating the second fluid

EX1001, '425 Patent, col 5, ln. 63 – col. 6, ln. 8.

223. Truxor neither describes nor shows any valve connected to its nozzle. And Dr.

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Winkel does not assert that what he points to as the nozzle of Truxor is capable of performing the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating." Carrier does not remedy this deficiency of Truxor. *See* Section XII.G. Yoon also fails to remedy this deficiency of Truxor. Yoon does not describe any valve(s) or fluid nozzle(s) that perform the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating." Truxor, Yoon, and Carrier do not describe any control of valves to provide proportional flow between nozzles to control the vehicle.

224. Thus, it is my opinion that the Truxor Combination does not render Claim 7 obvious.

H. Claim 12

225. Claim 12 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, and 4 obvious. Claim 12 is not obvious at least because of its dependence on Claims 1, 2, 3, and 4.

226. Additionally, Truxor does not describe "wherein the power source is . . . connected to the fluid pump by the ***mechanical drive***." Dr. Winkel asserts that Truxor's Doro pump is operated by a hydraulic motor, "which is powered by the power source (the diesel engine)." EX1004, Winkel Decl. ¶ 279. He then attempts to assert that a mechanical drive connects the diesel engine and the Doro pump:

> 279. "The Doro Pump [(the fluid pump)] is operated by a hydraulic motor" which is powered by the power source (the diesel engine). EX1006, 10; *see also* EX1021-EX1022, 13; EX1023, 11. A hydraulic motor includes an output shaft to transmit power from the hydraulic motor. Fluid pumps include an input shaft to drive the pump mechanism and move fluid. Thus, Truxor discloses a mechanical drive connection operably connecting the diesel engine and the fluid pump.

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Id. Dr. Winkel is incorrect in his analysis. That a diesel engine includes an output shaft connected to a hydraulic pump and a hydraulic motor has an output shaft that is connected to a pump mechanism, does not mean that there is a "mechanical drive connection" between the diesel engine and the Doro pump. Instead, it is a ***hydraulic*** connection. In particular, the hydraulic pump is hydraulicly connected to the hydraulic motor by hydraulic lines; there is no "mechanical drive" between the hydraulic pump and hydraulic motor. Other than this convoluted argument, Dr. Winkel points to no other description in Truxor that "the power source is . . . connected to the fluid pump by the mechanical drive" as recited in Claim 12.

227. Dr. Winkel also asserts that "a POSA would have understood that there were limited drive systems available and that there would have been a high likelihood of success in using a mechanical drive to connect these pumps to the power source." EX1004, Winkel Decl. ¶ 280. However, Dr. Winkel does not provide any support for this statement; nor does he provide any analysis as to why a POSITA would have been motivated to modified Truxor to utilize "a mechanical drive to connect these pumps to the power source" or how such modification would have been made without a substantial reconstruction of Truxor.

228. Therefore, the combination of Truxor and Yoon or Carrier fails to render Claim 12 obvious.

I. Claim 13

229. Claim 13 depends from Claim 12 and recites: "The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, 4, and 12 obvious. Claim 13 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, and 12.

J. Claim 14

230. Claim 14 depends from Claim 13 and recites: "The vehicle of claim 13, wherein

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the ground engaging propulsion structure comprises a set of wheels." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, and 13 obvious. Claim 14 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, and 13.

K. Claim 15

231. Claim 15 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the ground engaging propulsion structure comprises at least two powered wheels." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, and 14 obvious. Claim 15 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

L. Claim 16

232. Claim 16 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, and 14 obvious. Claim 16 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

M. Claim 17

233. Claim 17 depends from Claim 16 and recites: "The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, 14, and 16 obvious. Claim 17 is not obvious at least because of its dependence on Claims 1 and 13.

N. Claim 18

234. Claim 18 depends from Claim 17 and recites: "The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, and

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17 obvious. Claim 18 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

O. Claim 19

235. Claim 19 depends from Claim 17 and recites: "The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." As described above, the combination of Truxor and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17 obvious. Claim 19 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

236. Dr. Winkel alleges that "the Doro Pump and the nozzle of Truxor could be used to propel the vehicle and control the speed and direction of the vehicle while floating." EX1004, Winkel Decl. ¶ 289. This statement is unsupported by Truxor. Truxor does not teach that the output from the Doro pump can be used to control the speed and/or direction of the vehicle while it is floating. There is no disclosure in Truxor that its Doro pump is powerful enough to overcome drag to propel or maneuver the Truxor vehicle while it is in water. Moreover, Dr. Winkel includes a photograph of the Truxor in support of this argument; however, the Truxor vehicle is shown partially on land and not moving. *See* EX1004, Winkel Decl. ¶ 289. Additionally, Dr. Winkel asserts that "operation of the Doro Pump with the nozzle, and variation of the direction of the nozzle, would move fluid and control the speed and direction of the vehicle while it is floating." EX1004, Winkel Decl. ¶ 290. Dr. Winkel provides no support for this argument. He points to nothing in Truxor as providing the capability of "variation of the direction of the nozzle" as controlling speed or direction of the vehicle of Truxor. As I describe above in Section XII.G, Carrier does not provide this functionality. Nor has Dr. Winkel pointed to any description of Yoon to provide this functionality.

237. I have also considered whether the combination of Truxor and Yoon or Carrier meets all of the limitations of Claim 19 if the language reciting "fluid mover" is construed as a means-plus-function claim limitation. Under that construction, it is my opinion that the Truxor

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Combination fails to disclose the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating."

238. As explained above, the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating" is: "valve(s) and fluid nozzle(s)." Specifically, the '425 Patent describes that proportioning the fluid flow from the nozzles can be used to control movement of the vehicle while floating:

Valve structure comprising a valve **15** corresponding to each fluid nozzle **11**, **13**, **16**, **17** is also provided. The valves **15** are powered and operable to open or close. The valves **15** may be opened fully or partially to proportion flow between the plurality of fluid nozzles. Cooperation between the valves **15** and the plurality of fluid nozzles is used to provide directional control and motive power for the vehicle while floating. For example, proportioning fluid flow from the right side fluid nozzles **17** to the left side fluid nozzles **16** causes the vehicle to turn to the right will floating. Similarly, fluid flow may be proportioned between the first fluid nozzle **11** and the second fluid nozzles **13** to cause the vehicle to move forward or backward. By rotating the second fluid

EX1001, '425 Patent, col 5, ln. 63 – col. 6, ln. 8.

239. Truxor neither describes nor shows any valve connected to its nozzle. And Dr. Winkel does not assert that what he points to as the nozzle of Truxor is capable of performing the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating." Carrier does not remedy this deficiency of Truxor. *See* Section XII.G. Yoon also fails to remedy this deficiency of Truxor. Yoon does not describe any valve(s) or fluid nozzle(s) that perform the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating." Truxor, Yoon, and Carrier do not describe any control of valves to provide proportional flow between nozzles to control the vehicle.

240. Thus, it is my opinion that the Truxor Combination does not render Claim 19

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obvious.

XIV. GROUND 3: CLAIMS 1-7 AND 12-19 ARE NOT OBVIOUS BASED ON SENWATEC IN VIEW OF YOON OR CARRIER

241. In the following sections I examine various claim elements of the '425 Patent and explain why at least Claim 1 is not rendered obvious by SenwaTec in view of Yoon or Carrier ("the SenwaTec Combination"). Claims 2-7 and 12-19 depend from Claim 1 and are not rendered obvious by the SenwaTec Combination for at least the same reasons. For the reasons set forth in Section XI, it is my opinion that a POSITA would not have been motivated to seek out SenwaTec and combine it with Yoon or Carrier to arrive at the claims of the '425 Patent.

A. Claim 1

1. THE SENWATEC COMBINATION FAILS TO DISCLOSE OR SUGGEST A FLUID PUMP FOR PUMPING LIQUID MANURE

242. Like Truxor, SenwaTec also discloses an amphibious vehicle that is designed to carry an onboard operator and a number of different tool attachments. In particular, SenwaTec's marketing brochure [EX1012] advertises a number of different attachments that can be installed on the end of its vehicle's excavator arm (boom arm), including weed cutter-bars, rakes, mowing buckets, excavating buckets, tree cutters, and dredge pumps:

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EX1012, SenwaTec, pp. 2-3.

243. Dr. Winkel asserts that a POSITA "would also have understood that the pump described by SenwaTec would be capable of pumping liquid manure, as the Amphi-King was shown pumping liquid manure in various pre-2013 publications and advertisements." EX1004, Winkel Decl. ¶ 302. Dr. Winkel cites to EX1027 and EX1028 in an attempt to support this assertion. I note that the Board has stated that "Exhibits 1026-1028 'do not on their face, demonstrate that UD Umweltdienste used the SenwaTec vehicle for pumping manure.'" Paper 12 at 25. The Board also stated "that Exhibit 1027, the English translation of Exhibit 1026, discusses a 'sewage pond' which it infers is processed from 'toilet waste,' but does not talk about manure.' *Id*. I also note that the Board found that my Declaration dated October 10, 2023 [EX2004] supports Patent Owner's argument that "'sewage ponds and manure lagoons are very different.'" *Id*. I also note that the Board stated that "Patent Owner also correctly notes that Exhibit 1027 does not even discuss pumping or show which tool is attached to the SenwaTec vehicle." *Id*. I further note that

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the Board "agree[s] with Patent Owner that Exhibits 1026 and 1027 do not clearly show that the SenwaTec vehicle was used for pumping manure." *Id*. Finally, I understand that the Board agrees with the Patent Owner "that 'there is simply no verifiable information in the record proving that the video [in Exhibit 1028] informs a POSITA that the SenwaTec vehicle was used to pump manure as opposed to mud, human sewage, or something else.'" *Id*. at 26. Simply, SenwaTec does not teach or even suggest that the SenwaTec vehicle and one of its pump attachments is capable of pumping liquid manure.

244. Nor would a POSITA consider the centrifugal pumps disclosed in SenwaTec to be suitable for manure pumping applications. Indeed, the Houle reference explains that even powerful centrifugal pumps are prone to clogging when used to pump manure and explains that "[s]uch devices however provide limited efficiency when the reservoir contains a thick floating crust or heavy bottom sediments":

Farm animal manure consists of solid particles in a liquid, and the solid particles either settle on the bottom of the container (as in the case of pig manure) or form a crust over the liquid (as in the case of cow manure) depending on the density of the solid matter and, in some cases, both conditions obtain. Thus, the mass of manure in the container must be thoroughly mixed prior to pumping in order to maintain the solid particles in suspension, otherwise only the liquid matter will be pumped out while the solid matter accumulates in the container. Moreover, such solid matter tends to clog the pump.

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Hitherto, manure handling pumps consisted of a powerful centrifugal pump disposed near the bottom of the container, the impeller turning about a vertical axis, and a conduit system coupled to the outlet of the pump for either circulating manure within the container or away therefrom into a manure spreader or a different container. The conduit system therefore has a first branch leading out of the container toward another container or toward a tank spreader, and a second branch leading to a suitable nozzle pipe for returning into the container the slurry being mixed. A gate controls the selection of conduit branch in order to either agitate the slurry or pump same out of the reservoir. Examples of such centrifugal systems of which many different designs are currently available from farm equipment manufacturers, are described in U.S. Pat. Nos. 3,905,725 dated Sept. 16, 1975 (R. L. Johnson), 3,446,151, May 27, 1969 (H. G. V. Anderson), 3,456,592, July 22, 1969 (L. L. Nelsen) and 3,966,361, June 29, 1976 (B. L. House). Such devices however provide limited efficiency when the reservoir contains a thick floating crust or heavy bottom sediments. Indeed, the mixing capabilities of centrifugal pump systems are at best limited and time consuming, and no agitation takes place during transfer of the slurry to a different container into a tank spreader. Furthermore, clogging of the pump's impeller and consequential loss of pump efficiency remains a serious shortcoming.

EX2010, U.S. Pat. No. 4,406,413, col. 1, ln. 24-63.

245. While Dr. Winkel states that dredging pumps have been used for pumping liquid manure and cites to EX1058, he provides no analysis or opinion that the pump shown in SenwaTec [EX1012] is a dredging pump like that referred to in EX1058. For example, he does not conduct any analysis of the tolerances, pumping head, pumping capacity, power capacities, or other characteristics of the pump of SenwaTec nor does he make any comparison of such characteristics to manure pumps or the dredging pump referred to in EX1058. Without providing any analysis of whether the pump of SenwaTec [EX1012] is structurally similar to the dredging pump referred to in EX1058 or any other manure pump, Dr. Winkel has failed to support his assertion that the pump shown in SenwaTec is capable of pumping liquid manure.

246. As described herein, a POSITA would understand that liquid manure has high total solids content, behaves like a non-Newtonian fluid, and, prior to being agitated, often has large,

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hard, and thick crust floating thereon, as well as abrasive bedding solids therein. *See supra* Section IX.A. There is nothing in SenwaTec [EX1012] that describes or suggests that its pump is capable of pumping the hard thick crusts that a POSITA would have understood to be in the liquid manure prior to agitation. For these reasons, it is my opinion that a POSITA would not have understood SenwaTec to describe a pump that is capable of pumping liquid manure with the suspended solids that are routinely encountered therein.

247. In view of this background knowledge and the fact that the SenwaTec reference itself does not teach that its centrifugal pumps are designed and used to pump manure, a POSITA would not consider these pumps to be "a fluid pump for pumping liquid manure" as required by the claims.

2. THE SENWATEC COMBINATION FAILS TO DISCLOSE ALL OF THE WIRELESS REMOTE CONTROL LIMITATIONS OF CLAIM 1

248. Claim 1 requires "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 fluid 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." As explained above, SenwaTec does not disclose a pump that pumps liquid manure so it follows that the SenwaTec Combination also fails to teach wireless remote control of "a flow of liquid manure from the fluid pump."

249.

3. THE SENWATEC COMBINATION FAILS TO DISCLOSE THE CLAIMED COMBINATION OF ELEMENTS, WHICH WHEN CONSIDERED COLLECTIVELY, DEFINE AN AMPHIBIOUS MANURE LAGOON AGITATION VEHICLE

250. As explained above, when the claim elements are considered together as a claimed combination, what is claimed is an amphibious vehicle that is specially adapted for the particular purpose of disrupting the crust and recirculating liquid manure in a manure lagoon, where the

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vehicle can drive into, out of, and navigate the manure lagoon by wireless remote control.

251. SenwaTec's marketing brochure [EX1012] prominently advertises at the top of the first page its expertise in the following areas "Ditch Cleaner And Slope Mowers," "Moving and Clearing Boats," "Weed Harvesters," "Amphibious Vehicles," and "Cutter Suction And Excavating Dredges":

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EX1012, SenwaTec, p. 1.

252. If a POSITA were to even make a combination of SenwaTec with Yoon or Carrier,

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the result would be an amphibious remote-controlled weed clearing and dredging vehicle – not an amphibious manure lagoon agitation/pumping vehicle.

4. A POSITA WOULD NOT HAVE HAD A REASONABLE EXPECTATION OF SUCCESS IN COMBINING SENWATEC WITH YOON OR CARRIER

253. The amphibious vehicle disclosed in SenwaTec and its tool attachments are designed to be operated by an on-board operator. As a result, SenwaTec fails to teach the limitations of Claim 1 that recite "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 fluid 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."

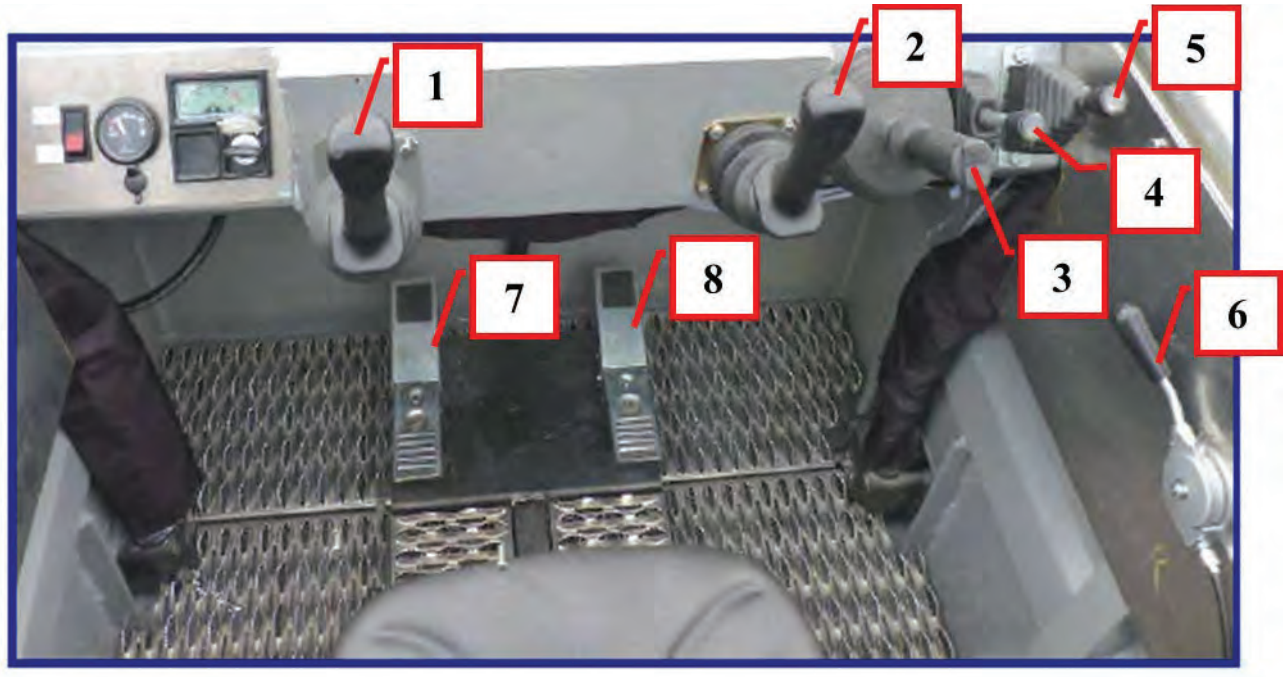
254. With respect to Ground 3, Dr. Winkel asserts that a POSITA would **add** wireless remote-control functionality to the amphibious vehicle disclosed in SenwaTec in view of the remote-control teachings of Yoon or Carrier; however, in my opinion a POSITA would not have had a reasonable expectation of success in making this combination and achieving the claimed invention.

255. It is my opinion that a POSITA would not have been motivated to combine the remote-control teachings of Yoon or Carrier with SenwaTec to arrive at the claimed invention. SenwaTec is described as having a front crane onto which different working tools and attachment units can be attached. *See* EX1012 at 2, 3. A POSITA would not have been motivated to remove the human on-board operator from SenwaTec because in doing so, the ability of the human on-board operator to sense or feel the location of the tool attached to SenwaTec's crane would have been severely hindered. When an operator is on-board the vehicle of Truxor, they would be able to feel whether the attached tool is in the desired location to use the tool. Removing the on-board operator from SenwaTec and replacing that on-board operator with a remote control system would entirely remove that tactile feel provided by being physically on the vehicle of SenwaTec.

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256. Moreover, it is my opinion that a POSITA would not have had a reasonable expectation of success in combining the remote-control teachings of Yoon or Carrier with SenwaTec. Dr. Winkel has not shown or even attempted to explain whether SenwaTec's manual controls lend themselves to remote control, how remote control over the various functions could be implemented, or that the resulting combination would actually work in the manure lagoon environment.

257. In my opinion, SenwaTec's manual controls depend on an onboard operator and close proximity observation of the submersed pump. As shown in the photograph below, the vehicle disclosed in SenwaTec has at least 8 different control interfaces – 5 separate joysticks, 2 foot pedals, and 1 hand-lever:



EX1012, SenwaTec, p. 1.

258. The difficulties with converting hydraulic controls of this type to wireless remote control would be known to a POSITA. Teleoperation is a term often used when a machine or robot is operated from a distance (aka remote control). The difficulties of operating an excavator-like machine system in a teleoperation type environment lie from delay (latency) in controls, lack of

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tactile feedback (which is provided through onboard hydraulic controls), and an overload of visual information. EX2028, pp. 1, 4-6. The human machine interface (HMI) of hydraulic excavator controls has not evolved much in the last couple of decades and therefore does not lend itself to easily being converted to teleoperation. EX2025, p. 3. In the 2013-2014 time period, commentators explained that further studies and development was needed to convert these types of manual excavator-like controls to wireless remote-control. EX2025, p. 8. Further, ASME papers show this was still an area requiring further development and new control systems in 2022. EX2028, pp. 1-2, 4-6.

259. Dr. Winkel has not shown or even attempted to explain how remote control over the various functions could be implemented, how a POSITA could overcome these difficulties when making the SenwaTec combination, or that the resulting combination would actually work in the manure lagoon environment.

260. Even today, some ten years later, there is no evidence that a remote-control option has been added to the SenwaTec vehicle. On October 4, 2023, I visited the Berky website at https://www.berky.de/en. I understand from the Declaration of Ansgar Lonnemann [EX1013] that Berky purchased SenwaTec. In particular, the Berky Nereus 240 AMPHI appears to correspond to the SenwaTec amphibious vehicle depicted in EX1012. I was unable to find any reference to any features or options that indicated remote control of Berky's vehicles is available as an option for their products.

261. On October 4, 2023, I took screenshots from the Berky website and compiled them as EX2027. I therefore certify that the screenshots shown in EX2027 are true and correct images of the Berky website identified in the paragraph above. The fact that SenwaTec/Berky has not, to this day, added a remote control option to its vehicles provides evidence that this would not be a simple feat that could be accomplished by routine experimentation.

262. For these reasons, it is my opinion that a POSITA would not expect SenwaTec's controls to easily lend themselves to remote control.

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263. It is also my opinion, that a POSITA would not reasonably expect success in operating the SenwaTec vehicle from a remote location where the positioning and operation of the submerged pump would be difficult to observe.

264. Photographs in SenwaTec's marketing brochure [EX1012] suggest to a POSITA that remote control of SenwaTec's pumping functionality from a distance would be a major problem given that the operators in the photographs are STANDING UP to get a better view of the submerged pump even though the operator's seat can't be more than 10 feet from the pump in these photographs:



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EX1012, SenwaTec, p. 2. This reinforces what a POSITA would readily appreciate – it would be difficult if not impossible to control and operate this type of vehicle and pump from a remote location.

265. Dr. Winkel also fails to address another problem that a POSITA would expect if they attempted to add remote control functionality to SenwaTec – remote control increases the likelihood of a rollover.

266. One of the video screenshots in Exhibit B to the Lonnemann Declaration illustrates that SenwaTec's vehicle has a rollover risk, much like the Truxor vehicle:

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EX1013, Lonnemann Decl., p. 14.

267. Manure lagoons typically have steep embankments that can be covered in manure, mud, sand, and/or ice and are therefore extremely slippery. EX1004, Winkel Decl., ¶¶334, 336. In my opinion, a POSITA would expect the instability issues with the SenwaTec vehicle to 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 remote control functionality to SenwaTec.

268. As a result, a POSITA would not have had a reasonable expectation that adding remote control functionality to SenwaTec would be successful in achieving the claimed invention - an amphibious remote-controlled manure agitation vehicle that has to traverse steep and slippery

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embankments while entering and exiting manure lagoons.

B. Claim 2

269. Claim 2 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump." As described above the combination of SenwaTec and Yoon or Carrier does not render Claim 1 obvious. Claim 2 is not obvious at least because of its dependence on Claim 1.

C. Claim 3

270. Claim 3 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the conduit comprises an opening at an end thereof." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1 and 2 obvious. Claim 3 is not obvious at least because of its dependence on Claims 1 and 2.

D. Claim 4

271. Claim 4 depends from Claim 3 and recites: "The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, and 3 obvious. Claim 4 is not obvious at least because of its dependence on Claims 1, 2, and 3.

E. Claim 5

272. Claim 5 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, and 4 obvious. Claim 5 is not obvious at least because of its dependence on Claims 1, 2, 3, and 4.

F. Claim 6

273. Claim 6 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination

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of SenwaTec and Yoon or Carrier does not render Claims 1 and 2 obvious. Claim 6 is not obvious at least because of its dependence on Claims 1 and 2.

G. Claim 7

274. Claim 7 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claim 1 obvious. Claim 7 is not obvious at least because of its dependence on Claim 1.

275. Dr. Winkel asserts that the pump of SenwaTec could be used to propel and steer the SenwaTec vehicle. EX1004, Winkel Decl. ¶ 314. This statement is unsupported by SenwaTec. SenwaTec does not teach that the output from its pump can be used to control the speed and/or direction of the vehicle while it is floating. There is no disclosure in SenwaTec is powerful enough to overcome drag to propel or maneuver the SenwaTec vehicle while it is in water. As I describe above in Section XII.G, Carrier does not provide this functionality. Nor has Dr. Winkel pointed to any description of Yoon to provide this functionality.

276. Dr. Winkel also asserts that rotation of SenwaTec's "wheels while floating would cause the vehicle to move and would vary the speed or direction of the vehicle." EX1004, Winkel Decl. ¶ 315. SenwaTec does not support this assertion and Dr. Winkel points to nothing in SenwaTec in support of this assertion.

277. I have also considered whether the combination of SenwaTec and Yoon or Carrier meets all of the limitations of Claim 7 if the language reciting "fluid mover" is construed as a means-plus-function claim limitation. Under that construction, it is my opinion that the SenwaTec Combination fails to disclose the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating."

278. As explained above, the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the

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vehicle when the vehicle is floating" is: "valve(s) and fluid nozzle(s)." Specifically, the '425 Patent describes that proportioning the fluid flow from the nozzles can be used to control movement of the vehicle while floating:

Valve structure comprising a valve **15** corresponding to each fluid nozzle **11**, **13**, **16**, **17** is also provided. The valves **15** are powered and operable to open or close. The valves **15** may be opened fully or partially to proportion flow between the plurality of fluid nozzles. Cooperation between the valves **15** and the plurality of fluid nozzles is used to provide directional control and motive power for the vehicle while floating. For example, proportioning fluid flow from the right side fluid nozzles **17** to the left side fluid nozzles **16** causes the vehicle to turn to the right will floating. Similarly, fluid flow may be proportioned between the first fluid nozzle **11** and the second fluid nozzles **13** to cause the vehicle to move forward or backward. By rotating the second fluid

EX1001, '425 Patent, col 5, ln. 63 – col. 6, ln. 8.

279. SenwaTec neither describes nor shows any valve connected to its nozzle. And Dr. Winkel does not assert that what he points to as the nozzle of SenwaTec is capable of performing the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating." Carrier does not remedy this deficiency of SenwaTec. *See* Section XII.G. Yoon also fails to remedy this deficiency of SenwaTec. Yoon does not describe any valve(s) or fluid nozzle(s) that perform the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating." SenwaTec, Yoon, and Carrier do not describe any control of valves to provide proportional flow between nozzles to control the vehicle.

280. Thus, it is my opinion that the SenwaTec Combination does not render Claim 7 obvious.

H. Claim 12

281. Claim 12 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid

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pump by the mechanical drive." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, and 4 obvious. Claim 12 is not obvious at least because of its dependence on Claims 1, 2, 3, and 4.

282. Additionally, SenwaTec does not describe "wherein the power source is . . . connected to the fluid pump by the ***mechanical drive***." Dr. Winkel asserts that SenwaTec's pump is operated by a hydraulic motor, which is powered by the diesel engine. *See* EX1004, Winkel Decl. ¶ 319. He then attempts to assert that a mechanical drive connects the diesel engine and the Doro pump:

> 319. SenwaTec also discloses that the centrifugal (fluid) pump is hydraulically powered by the diesel engine. *Id.* A hydraulic system operates by transferring mechanical energy through the pressurized hydraulic system, which powers a hydraulic motor. A hydraulic motor includes an output shaft to transmit power from the hydraulic motor. Centrifugal fluid pumps include an input shaft to drive the pump mechanism and move the fluid. Thus, SenwaTec discloses a mechanical drive connection operably connecting the diesel engine and the fluid pump.

Id. Dr. Winkel is incorrect in his analysis. That the diesel engine includes an output shaft connected to a hydraulic pump and a hydraulic motor has an output shaft that is connected to a pump mechanism, does not mean that there is a "mechanical drive connection" between the diesel engine and SenwaTec's pump. Instead, it is a ***hydraulic*** connection. In particular, the hydraulic pump is hydraulicly connected to the hydraulic motor by hydraulic lines; there is no "mechanical drive" between the hydraulic pump and hydraulic motor. Other than this convoluted argument, Dr. Winkel points to no other description in SenwaTec that "the power source is . . . connected to the fluid pump by the mechanical drive" as recited in Claim 12.

283. Dr. Winkel also asserts that "a POSA would have understood that there were limited drive systems available and that there would have been a high likelihood of success in using a mechanical drive to connect these pumps to the power source." EX1004, Winkel Decl. ¶ 320. However, Dr. Winkel does not provide any support for this statement; nor does he provide

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any analysis as to why a POSITA would have been motivated to modified SenwaTec to utilize "a mechanical drive to connect these pumps to the power source" or how such modification would have been made without a substantial reconstruction of SenwaTec.

284. Therefore, the combination of SenwaTec and Yoon or Carrier fails to render Claim 12 obvious.

I. Claim 13

285. Claim 13 depends from Claim 12 and recites: "The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, 4, and 12 obvious. Claim 13 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, and 12.

J. Claim 14

286. Claim 14 depends from Claim 13 and recites: "The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, and 13 obvious. Claim 14 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, and 13.

K. Claim 15

287. Claim 15 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the ground engaging propulsion structure comprises at least two powered wheels." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, and 14 obvious. Claim 15 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

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L. Claim 16

288. Claim 16 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, and 14 obvious. Claim 16 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

M. Claim 17

289. Claim 17 depends from Claim 16 and recites: "The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, 14, and 16 obvious. Claim 17 is not obvious at least because of its dependence on Claims 1 and 13.

N. Claim 18

290. Claim 18 depends from Claim 17 and recites: "The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17 obvious. Claim 18 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

O. Claim 19

291. Claim 19 depends from Claim 17 and recites: "The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." At least the same reasons as described with respect to Claim 7, the combination of SenwaTec and Yoon or Carrier does not describe "wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." Additionally, as described above, the combination of SenwaTec and Yoon or Carrier does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, or 17 obvious. Claim 19 is not obvious at least because of its dependence on

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Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

292. I have also considered whether the combination of SenwaTec and Yoon or Carrier meets all of the limitations of Claim 19 if the language reciting "fluid mover" is construed as a means-plus-function claim limitation. Under that construction, it is my opinion that the SenwaTec Combination fails to disclose the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating."

293. As explained above, the structure described in the '425 Patent specification that performs the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating" is: "valve(s) and fluid nozzle(s)." Specifically, the '425 Patent describes that proportioning the fluid flow from the nozzles can be used to control movement of the vehicle while floating:

> Valve structure comprising a valve **15** corresponding to each fluid nozzle **11**, **13**, **16**, **17** is also provided. The valves **15** are powered and operable to open or close. The valves **15** may be opened fully or partially to proportion flow between the plurality of fluid nozzles. Cooperation between the valves **15** and the plurality of fluid nozzles is used to provide directional control and motive power for the vehicle while floating. For example, proportioning fluid flow from the right side fluid nozzles **17** to the left side fluid nozzles **16** causes the vehicle to turn to the right will floating. Similarly, fluid flow may be proportioned between the first fluid nozzle **11** and the second fluid nozzles **13** to cause the vehicle to move forward or backward. By rotating the second fluid

EX1001, '425 Patent, col 5, ln. 63 – col. 6, ln. 8.

294. SenwaTec neither describes nor shows any valve connected to its nozzle. And Dr. Winkel does not assert that what he points to as the nozzle of SenwaTec is capable of performing the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating." Carrier does not remedy this deficiency of SenwaTec. *See* Section XII.G. Yoon also fails to remedy this deficiency of SenwaTec. Yoon does not describe any valve(s) or

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fluid nozzle(s) that perform the function of "moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating." SenwaTec, Yoon, and Carrier do not describe any control of valves to provide proportional flow between nozzles to control the vehicle.

295. Thus, it is my opinion that the Truxor Combination does not render Claim 19 obvious.

XV. GROUND 4: CLAIMS 1-21 ARE NOT OBVIOUS BASED ON PUCK IN VIEW OF BRYHAM

296. In the following sections I examine various claim elements of the '425 Patent and explain why at least Claim 1 is not rendered obvious by Puck in view of Bryham ("the Puck-Bryham Combination"). Claims 2-21 depend from Claim 1 and are not rendered obvious by the Puck-Bryham Combination for at least the same reasons. For the reasons set forth in Section XI, it is my opinion that a POSITA would not have been motivated to combine Puck with Bryham to arrive at the claims of the '425 Patent.

A. Claim 1

1. THE PUCK-BRYHAM COMBINATION FAILS TO DISCLOSE OR SUGGEST A "POWER SOURCE CONFIGURED TO PROVIDE POWER TO BOTH THE GROUND ENGAGING PROPULSION STRUCTURE AND THE FLUID PUMP"

297. Neither Puck nor Bryham disclose "a power source that provides power to <u>both</u> a manure pump and a ground engaging propulsion structure" as required by the language of Claim 1.

298. Dr. Winkel argues that a POSITA would be motivated to use Puck's power source to also power the wheels being added by Bryham:

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> 348. A POSA would have been motivated to use the same internal combustion engine of Puck to power the land-based propulsion system of Bryham because it would be less expensive, more efficient, take up less space, and weigh less than providing two separate engines, one for the fluid pump and one for the hydraulic pump for land-propulsion. Further, the diesel engine of Puck would be more than sufficient to power the land-based propulsion, which Puck teaches could be as high as 2000 HP. EX1014, ¶[0024].

EX1004, Winkel Decl., p. 194; *see also* Petition, p. 77. But Dr. Winkel does not actually show or explain why the claimed arrangement "would be less expensive, more efficient, take up less space, and weigh less."

299. In my opinion, a POSITA would not find the claimed arrangement, where the power source powers both a manure pump and a hydraulic pump that powers the hydraulic motors of the ground engaging propulsion structure to be obviously "less expensive, more efficient, take up less space, and weigh less" than the other potential options disclosed in Bryham. For example, one of the preferred embodiments disclosed in Bryham utilizes separate electric motors to power Bryham's wheels. EX1015, Bryham, col. 16, ln. 13-27. Dr. Winkel appears to be relying on hindsight bias rather than the teachings in the prior art references themselves to conclude that the claimed arrangement is obviously the best.

2. THE PUCK-BRYHAM COMBINATION FAILS TO DISCLOSE "WIRELESS REMOTE CONTROL CONFIGURED TO … (1) CONTROL THE GROUND ENGAGING PROPULSION STRUCTURE"

300. 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

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structure" as required by the language of Claim 1. And Bryham lacks any discussion of remote control and therefore fails to supply this element missing from Puck.

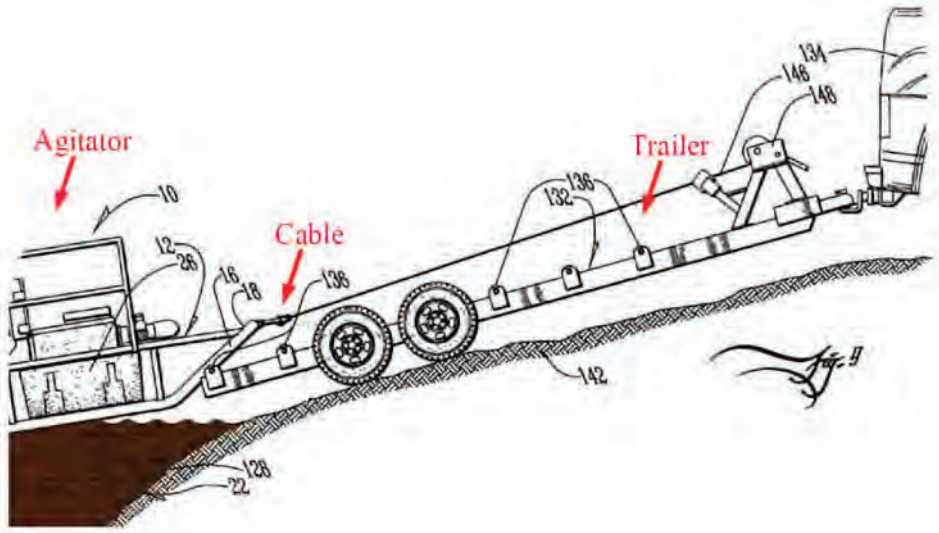
301. Dr. Winkel argues that a POSITA would have been motivated to configure the remote-control steering system of Puck (used while the boat of Puck is floating) to control the speed and direction of Bryham's wheels while the vehicle is ground engaging. EX1004, Winkel Decl., ¶¶349-350. But this argument 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.

3. A POSITA WOULD NOT HAVE POSSESSED A MOTIVATION TO COMBINE PUCK AND BRYHAM

302. For the reasons I state in Section XI above, and for the reasons I give in this Section, it is my opinion that a POSITA would not have been motivated to combine Puck and Bryham. 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.

303. 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:

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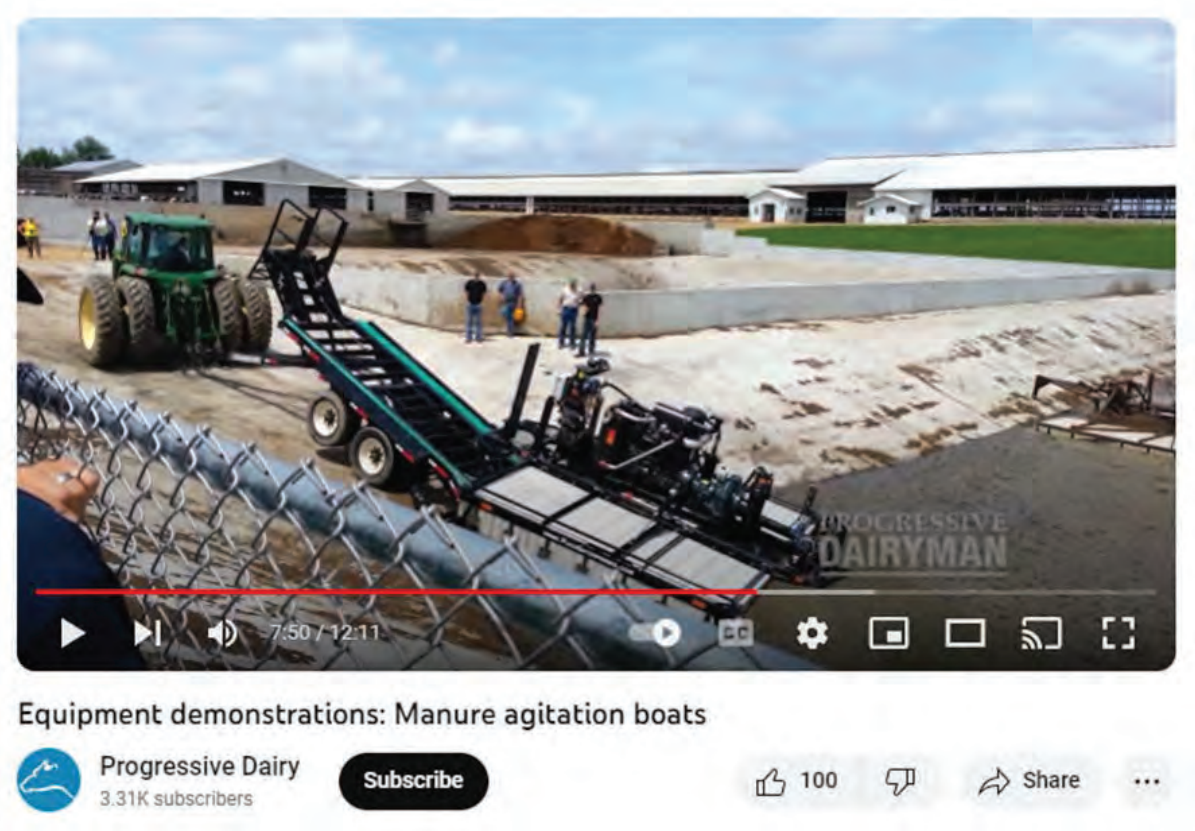
(*Id.*, FIG. 9 (annotated).)

EX1004, Winkel Decl., ¶332.

304. 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.

305. 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:

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EX2008, p. 7.

306. 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.

307. 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

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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.

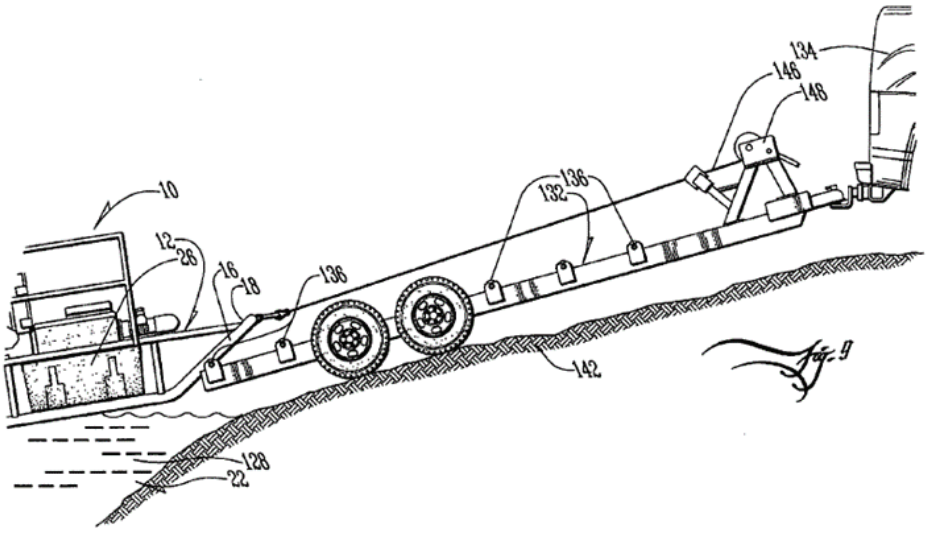
308. Furthermore, if a POSITA were concerned about "exposing a towing vehicle and trailer to highly corrosive environments" as Dr. Winkel argues (*see* EX1004, Winkel Decl., ¶335), they certainly would not have looked to substitute Puck's trailer, which did not need to be submersed in a manure lagoon, 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.

309. 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.

4. A POSITA WOULD NOT HAVE HAD A REASONABLE EXPECTATION OF SUCCESS IN COMBINING BRYHAM WITH PUCK

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

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EX1014, Puck, Figs. 8 and 9. As a result, Puck fails to teach the limitation of Claim 1 reciting "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor."

311. With respect to Ground 4, 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.

312. 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:

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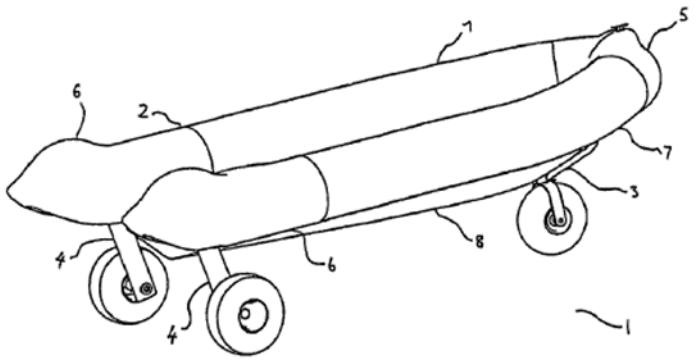


Figure 1

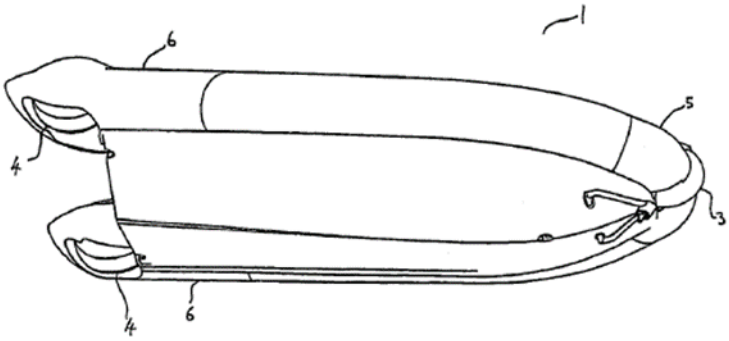


Figure 2

EX1015, Bryham, p. 2.

313. 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:

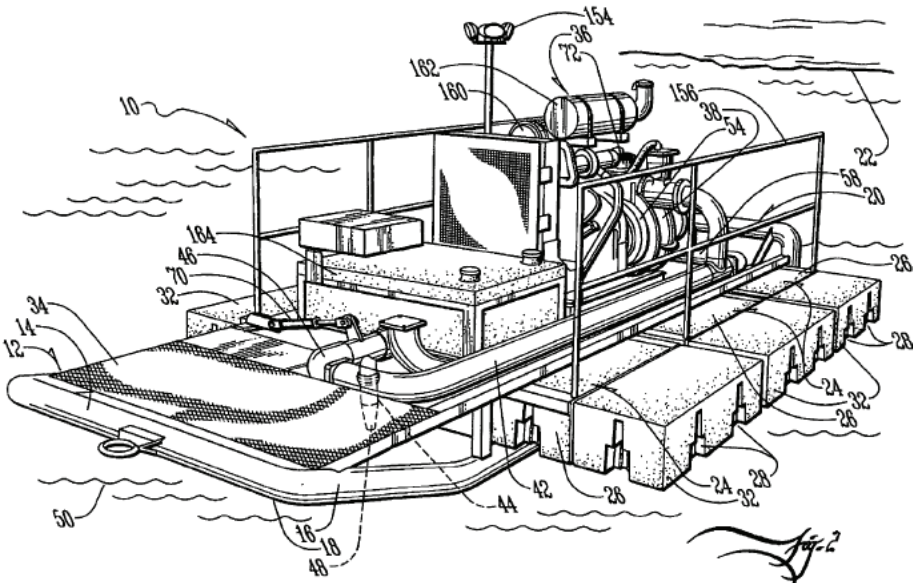
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(**10**) from a manure lagoon (**22**). (FIGS. **1-2**). The frame (**14**) defines a plurality of receiver slots (**24**) into which are provided modular dock sections (**26**), such as those known in the art. In the preferred embodiment, the dock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

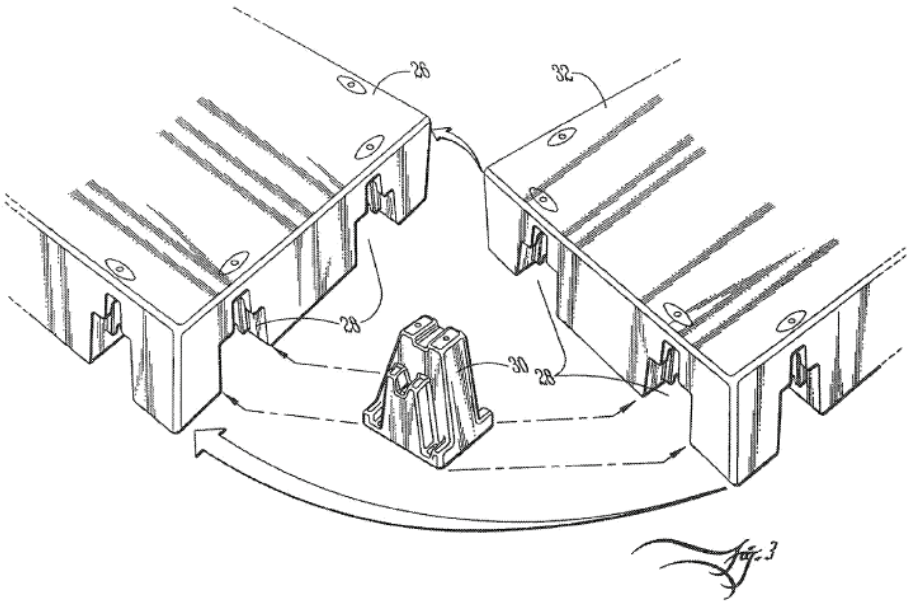
[0023] The modular dock sections (**26**) are provided with connector slots (**28**) to fit into interlocking mating engagement with connector pins (**30**). The connector pins (**30**) allow the modular dock sections (**26**) to connect to additional dock sections (**32**) in a manner such as that known 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.

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



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EX1014, Puck, pp. 3-4.

315. 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.

316. 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.

317. 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.

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

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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.

319. 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.

320. 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

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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.

B. Claim 2

321. Claim 2 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump." As described above, the combination of Puck and Bryham does not render Claim 1 obvious. Claim 2 is not obvious at least because of its dependence on Claim 1.

C. Claim 3

322. Claim 3 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the conduit comprises an opening at an end thereof." As described above, the combination of Puck and Bryham does not render Claims 1 and 2 obvious. Claim 3 is not obvious at least because of its dependence on Claims 1 and 2.

D. Claim 4

323. Claim 4 depends from Claim 3 and recites: "The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening." As described above, the combination of Puck and Bryham does not render Claims 1, 2, and 3 obvious. Claim 4 is not obvious at least because of its dependence on Claims 1, 2, and 3.

E. Claim 5

324. Claim 5 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, and 4 obvious. Claim 5 is not obvious at least because of its dependence on Claims 1, 2, 3, and 4.

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F. Claim 6

325. Claim 6 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Puck and Bryham does not render Claims 1 and 2 obvious. Claim 6 is not obvious at least because of its dependence on Claims 1 and 2.

G. Claim 7

326. Claim 7 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." As described above, the combination of Puck and Bryham does not render Claim 1 obvious. Claim 7 is not obvious at least because of its dependence on Claim 1.

H. Claim 8

327. Claim 8 depends from Claim 1 and recites: "The vehicle of claim 1, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above, the combination of Puck and Bryham does not render Claim 1 obvious. Claim 8 is not obvious at least because of its dependence on Claim 1.

I. Claim 9

328. Claim 9 depends from Claim 8 and recites: "The vehicle of claim 8, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." As described above, the combination of Puck and Bryham does not render Claims 1 and 8 obvious. Claim 9 is not obvious at least because of its dependence on Claims 1 and 8.

J. Claim 10

329. Claim 10 depends from Claim 4 and recites: "The vehicle of claim 4, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, and 4 obvious. Claim 10 is

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not obvious at least because of its dependence on Claims 1 and 4.

K. Claim 11

330. Claim 11 depends from Claim 10 and recites: "The vehicle of claim 10, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4 and 10 obvious. Claim 11 is not obvious at least because of its dependence on Claims 1, 2, 3, 4 and 10.

L. Claim 12

331. Claim 12 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, and 4 obvious. Claim 12 is not obvious at least because of its dependence on Claims 1, 2, 3, and 4.

M. Claim 13

332. Claim 13 depends from Claim 12 and recites: "The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, and 12 obvious. Claim 13 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, and 12.

333. Puck lacks a ground engaging propulsion structure and a hydraulic motor. Puck also does not describe that its wireless remote control can control a hydraulic motor. Dr. Winkel asserts that the "land-based propulsion system of Bryham can be driven with hydraulic motors and can be operated at variable speed." EX1004, Winkel Decl. ¶ 367. Yet, his citations to Bryham do not support this statement.

334. Dr. Winkel references the "clutch and torque converter or gearing system" of

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Bryham. *Id*. (quoting EX1015, col. 6, ln. 66-col. 7, ln. 2). However, a clutch, torque converter, or gearing system are in no way a hydraulic motor as claimed. And Dr. Winkel provides no explanation as to how a POSITA would consider them to be a hydraulic motor. He goes on to assert that "[o]peration of the clutch and torque converter or gearing system would result in a variation of the speed of the hydraulic motor and ground engaging propulsion structure." *Id*. But this statement is also entirely unsupported by Bryham. There is nothing in Bryham that describes a clutch, torque converter, or gearing system as even being connected to a hydraulic motor. In fact, Figure 19 of Bryham is the only figure that illustrates a clutch 81 and a torque converter 82:

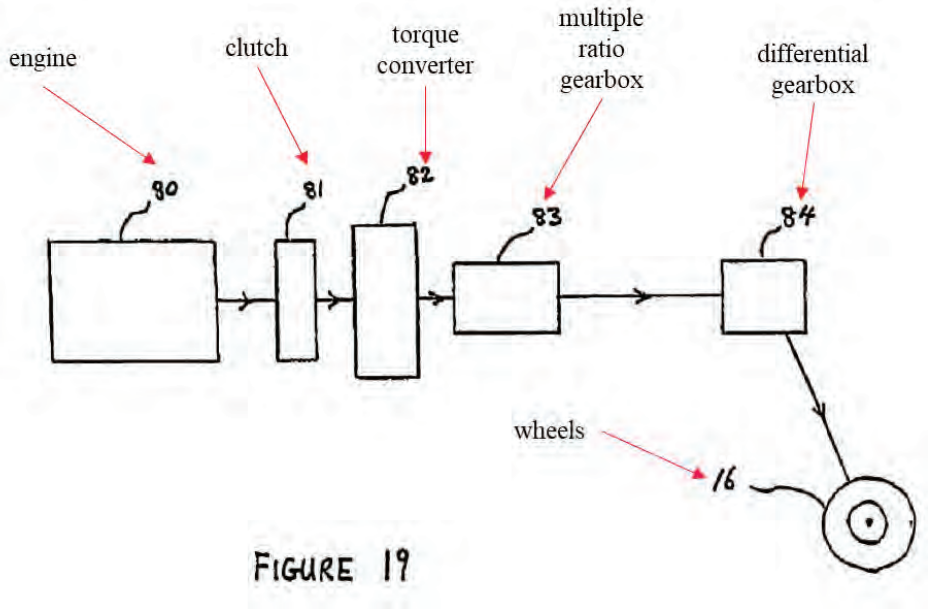


FIGURE 19

EX1015, Fig. 19, col. 15, ln. 25-32. Absent from this from this Figure 19 and the description of Bryham is the inclusion of a hydraulic motor in this arrangement.

335. Dr. Winkel then points to the description of Bryham with respect to Figure 23 as reciting that "hydraulic energy is used to drive an [sic] hydraulic motor 108, via valves 107, which can either drive the ground engagement means 16 directly, or via a transmission 83." EX1004, Winkel Decl. ¶ 367 (quoting EX1015 at col. 16, ln. 1-6); however, this does not advance his position. He states without support that "[o]peration of the valves would also result in a variation of the speed of the hydraulic motor(s) and ground engaging propulsion structure(s)." *Id*. But

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Bryham provides no description that its valves 107 are proportional or can vary the flow of hydraulic fluid to the hydraulic motor 108 such that hydraulic motor 108 could be operated at variable speed. Instead, the valves 107 could simply be valves to turn ON or turn OFF the flow of hydraulic fluid (thus fully OPEN or fully CLOSED).

336. Therefore for at least these additional reasons, the combination of Puck and Bryham does not render Claim 13 obvious.

N. Claim 14

337. Claim 14 depends from Claim 13 and recites: "The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, 12, and 13 obvious. Claim 14 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, and 13.

O. Claim 15

338. Claim 15 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the ground engaging propulsion structure comprises at least two powered wheels." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, 12, 13, and 14 obvious. Claim 15 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

P. Claim 16

339. Claim 16 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, 12, 13, and 14 obvious. Claim 16 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

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Q. Claim 17

340. Claim 17 depends from Claim 16 and recites: "The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, 12, 13, 14, and 16 obvious. Claim 17 is not obvious at least because of its dependence on Claims 1 and 13.

R. Claim 18

341. Claim 18 depends from Claim 17 and recites: "The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17 obvious. Claim 18 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

S. Claim 19

342. Claim 19 depends from Claim 17 and recites: "The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, or 17 obvious. Claim 19 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

T. Claim 20

343. Claim 20 depends from Claim 17 and recites: "The vehicle of claim 17, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, or 17 obvious. Claim 20 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

U. Claim 21

344. Claim 21 depends from Claim 20 and recites: "The vehicle of claim 20, wherein

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the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." As described above, the combination of Puck and Bryham does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, 17 or 20 obvious. Claim 19 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, 17 and 20.

XVI. GROUND 5: CLAIMS 1-21 ARE NOT OBVIOUS BASED ON PUCK IN VIEW OF BRYHAM AND BENNETT-II

345. In the following sections I examine various claim elements of the '425 Patent and explain why at least Claim 1 is not rendered obvious by Puck in view of Bryham and Bennett-II ("the Puck-Bryham-Bennett Combination"). Claims 2-21 depend from Claim 1 and are not rendered obvious by the Puck-Bryham-Bennett Combination for at least the same reasons. For the reasons set forth in Section XI, it is my opinion that a POSITA would not have been motivated to combine Puck with Bryham to arrive at the claims of the '425 Patent. Additionally, in response to Ground 4 above, I set forth that it is my opinion that the Puck-Bryham Combination does not render Claim 1-21 of the '425 Patent obvious. In incorporate by reference my analysis with respect to the Puck-Bryham combination herein into Ground 5. It is my opinion that Bennett-II does not correct the failings of the Puck-Bryham Combination and therefore that Claims 1-21 are not rendered obvious by the Puck-Bryham-Bennett Combination.

A. Claim 1

1. THE PUCK-BRYHAM-BENNETT COMBINATION FAILS TO DISCLOSE OR SUGGEST A "POWER SOURCE CONFIGURED TO PROVIDE POWER TO BOTH THE GROUND ENGAGING PROPULSION STRUCTURE AND THE FLUID PUMP"

346. Neither Puck, Bryham, nor Bennett-II disclose "a power source that provides power to both a manure pump and a ground engaging propulsion structure" as required by the language of Claim 1.

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347. Dr. Winkel argues that a POSITA would be motivated to use Puck's power source to also power the wheels being added by Bryham:

> 348. A POSA would have been motivated to use the same internal combustion engine of Puck to power the land-based propulsion system of Bryham because it would be less expensive, more efficient, take up less space, and weigh less than providing two separate engines, one for the fluid pump and one for the hydraulic pump for land-propulsion. Further, the diesel engine of Puck would be more than sufficient to power the land-based propulsion, which Puck teaches could be as high as 2000 HP. EX1014, ¶[0024].

EX1004, Winkel Decl., p. 194; *see also* Petition, p. 77. But Dr. Winkel does not actually show or explain why the claimed arrangement "would be less expensive, more efficient, take up less space, and weigh less."

348. In my opinion, a POSITA would not find the claimed arrangement, where the power source powers both a manure pump and a hydraulic pump that powers the hydraulic motors of the ground engaging propulsion structure to be obviously "less expensive, more efficient, take up less space, and weigh less" than the other potential options disclosed in Bryham. For example, one of the preferred embodiments disclosed in Bryham utilizes separate electric motors to power Bryham's wheels. EX1015, Bryham, col. 16, ln. 13-27. Dr. Winkel appears to be relying on hindsight bias rather than the teachings in the prior art references themselves to conclude that the claimed arrangement is obviously the best.

2. THE PUCK-BRYHAM-BENNETT COMBINATION FAILS TO DISCLOSE "WIRELESS REMOTE CONTROL CONFIGURED TO … (1) CONTROL THE GROUND ENGAGING PROPULSION STRUCTURE"

349. 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,

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¶¶[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 1. And Bryham lacks any discussion of remote control and therefore fails to supply this element missing from Puck.

350. Dr. Winkel argues that a POSITA would have been motivated to configure the remote-control steering system of Puck to control the speed and direction of the ground engagement means of Bryham 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 used for control over Bryham's steering and propulsion system (i.e., Bryham's wheels) while Puck's boat is on the ground. Dr. Winkel further states that Bennett-II's teachings of remote control support this modification of Puck and Bryham. I disagree.

351. Specifically, Dr. Winkel asserts that "[s]hould it be determined that the remote-control steering system of Puck could not be configured to control the Bryham wheels (*supra* Section X.B, [1.5]), Bennett-II explicitly teaches remote control of the ground engaging propulsion structure." EX1004, Winkel Decl. ¶ 378. Dr. Winkel does not point to any portion of Bennett-II in support of his assertion that "Bennett-II ***explicitly*** teaches remote control of the ground engaging propulsion structure." *Id*. (emphasis added).

352. The entirety of Bennett-II's description of remote control is limited to the following statements:

> **4**). Vehicle **10** may be configured for military applications and is configured to travel through various terrains or surfaces. More particularly, vehicle **10** is configured for both land and amphibious operation. Additionally, vehicle **10** may be operated by remote control. In one embodiment, vehicle **10** may be configured to travel at speeds of approximately 50 mph during land operation.

EX1017 at ¶ [0043]

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> **[0121]** 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**. In one embodiment, vehicle **10** is operative to drive autonomously without human input.

Id. at ¶ [00121]. Neither of these paragraphs "***explicity*** teach[] remote control of the ground engaging propulsion structure." Entirely absent from Bennett-II is any express teaching of remote control of a ground engaging propulsion structure or how such remote control would be implemented.

353. Bennett-II teaches an amphibious vehicle 10 with a pair of tracks 12, 14 that are driven by two drive units 590, 592 through a transmission 550 that is powered by a single engine 502.

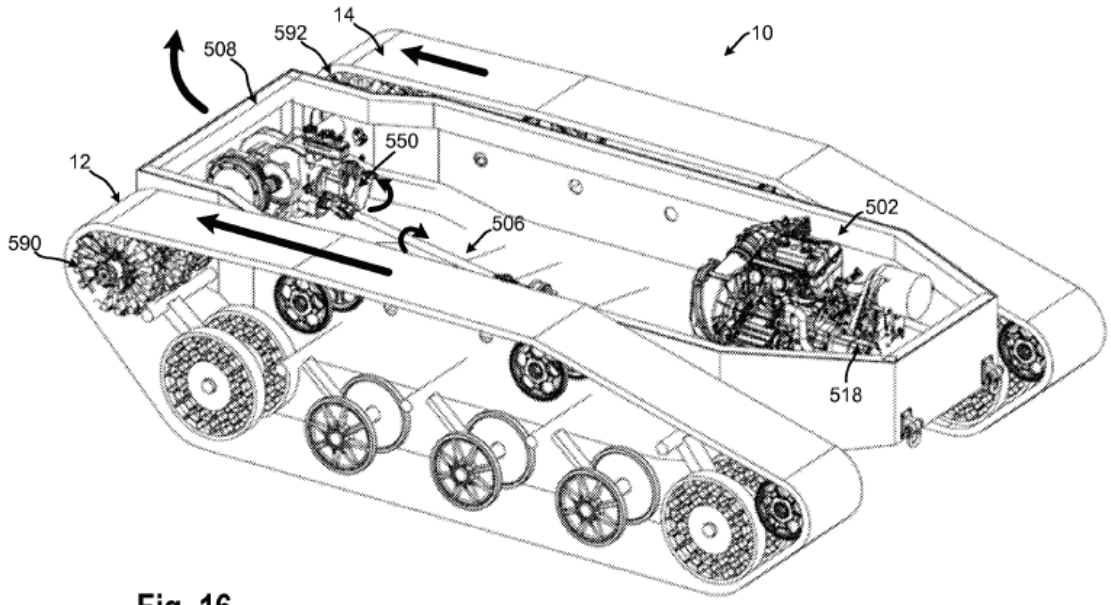


Fig. 16

EX1017, Bennett, p. 22.

354. That, Bennett-II provides the generalized statement that "vehicle 10 may be operated by remote control" tells a POSITA nothing about how one could modify the remotely controlled liquid manure flow system of Puck's boat to remotely control Bryham's 3-wheeled ground engagement system, which itself is substantially different from Bennett-II's drivetrain.

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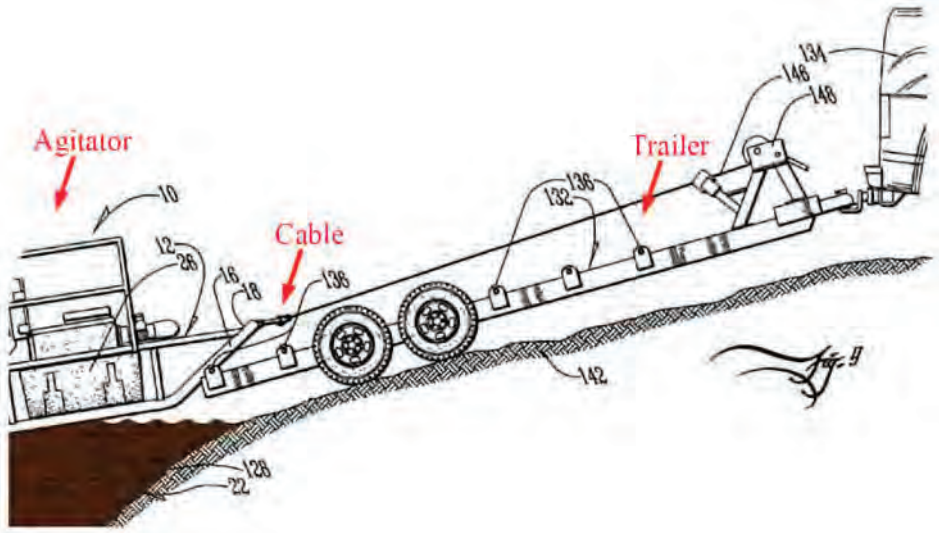
Simply, Bennett-II lacks any express teaching of how a POSITA would have actually implemented radio control of it Bennett-II's tracked drive system. Bennett-II also lacks any teaching of how a POSITA would modify Puck's remotely-controlled liquid manure flow system to also control a tracked drive system. Bryham entirely lacks a remote control, and Bennett-II also lacks any teaching of how a POSITA would be taught modify Puck's remotely-controlled liquid manure flow system to also control a 3-wheeled ground engagement system. In summary, the Puck-Bryham-Bennett Combination lacks any teaching of a "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 1.

3. A POSITA WOULD NOT HAVE POSSESSED A MOTIVATION TO COMBINE PUCK, BRYHAM, AND BENNETT-II

355. For the reasons I state in Section XI above, and for the reasons I give in this Section, it is my opinion that a POSITA would not have been motivated to combine Puck, Bryham, and Bennett-II. 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, ¶331. Neither of these reasons/flaws in Puck's design are actually supported by Puck's disclosure. And Bennett-II does not correct these problems or provide any additional motivation to add Bryham's wheels to Puck.

356. 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:

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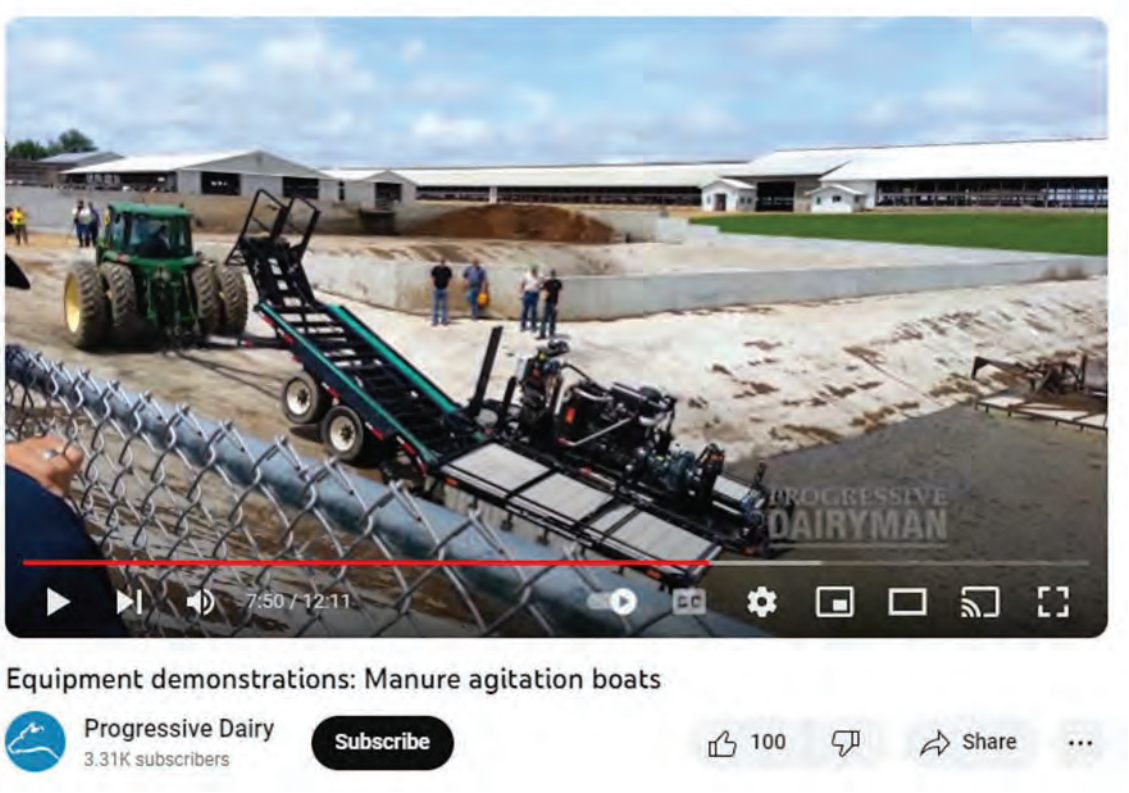
(*Id.*, FIG. 9 (annotated).)

EX1004, Winkel Decl., ¶332.

357. 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.

358. 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:

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EX2008, p. 7.

359. 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. Bennett-II's disclosure of remote control does not change the fact that the "problems" Dr. Winkel points to in Puck did not actually exist.

360. 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

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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.

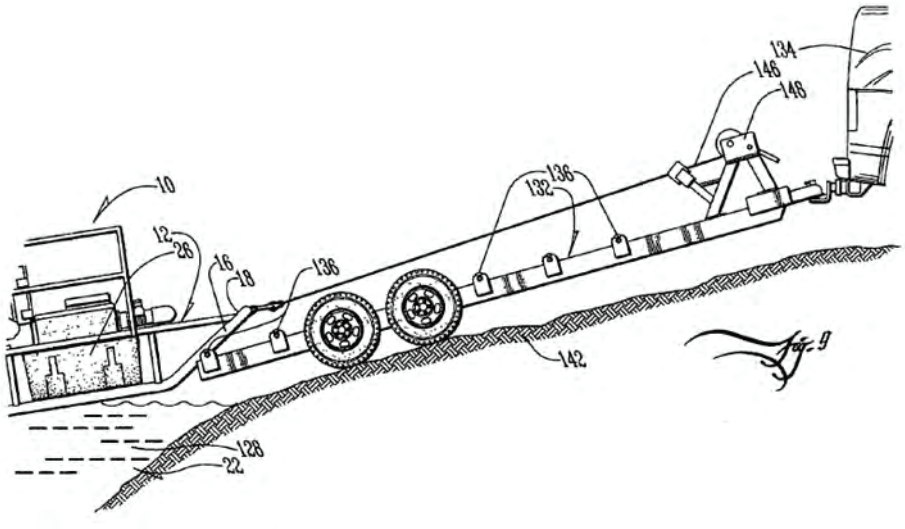
361. Furthermore, if a POSITA were concerned about "exposing a towing vehicle and trailer to highly corrosive environments" as Dr. Winkel argues (*see* EX1004, Winkel Decl., ¶335), they certainly would not have looked to substitute Puck's trailer, which did not need to be submersed in a manure lagoon, 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. Nor does Bennett-II suggest that corrosion would not be a problem if the Puck-Bryham-Bennett-II Combination were made. 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.

362. As a result, it is my opinion that Petitioner's combination of Puck, Bryham, and Bennett-II 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.

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4. A POSITA WOULD NOT HAVE HAD A REASONABLE EXPECTATION OF SUCCESS IN COMBINING BRYHAM AND BENNETT-II WITH PUCK

363. 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 Claim 1 reciting "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor."

364. With respect to Ground 5, Dr. Winkel asserts that a POSITA would **add** Bryham's wheels to the manure agitation boat disclosed in Puck and controlling Bryham's wheels using remote-control as generally discussed in Bennett-II; however, in my opinion a POSITA would not have had a reasonable expectation of success in making this combination and achieving the claimed invention.

365. 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:

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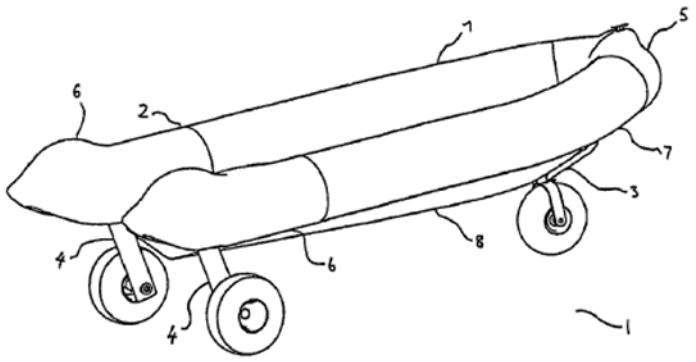


Figure 1

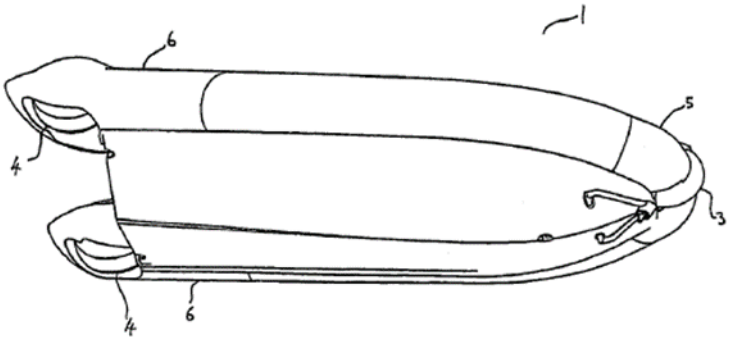


Figure 2

EX1015, Bryham, p. 2.

366. 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:

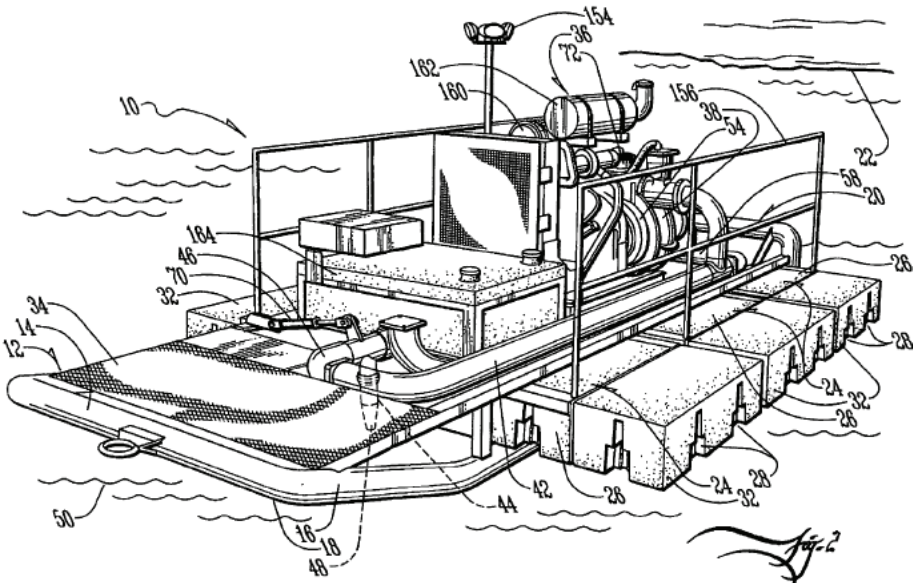
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(**10**) from a manure lagoon (**22**). (FIGS. **1-2**). The frame (**14**) defines a plurality of receiver slots (**24**) into which are provided modular dock sections (**26**), such as those known in the art. In the preferred embodiment, the dock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

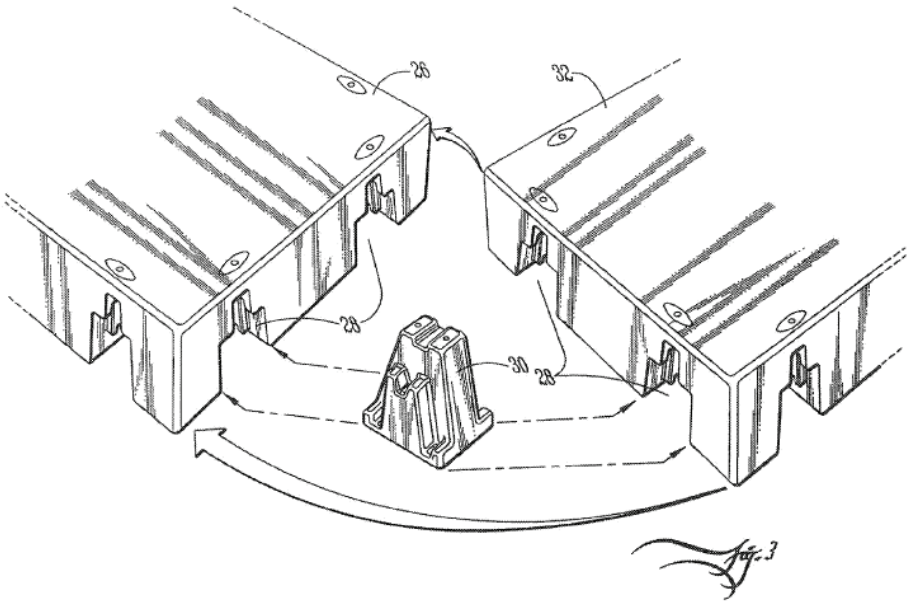
[0023] The modular dock sections (**26**) are provided with connector slots (**28**) to fit into interlocking mating engagement with connector pins (**30**). The connector pins (**30**) allow the modular dock sections (**26**) to connect to additional dock sections (**32**) in a manner such as that known 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, ¶¶ [0022]-[0023].

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



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EX1014, Puck, pp. 3-4.

368. 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.

369. 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.

370. 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.

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

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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.

372. 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, Petitioner 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.

373. In my opinion, a POSITA would recognize that the instability, steering, and traction issues with the Bryham's ground engaging wheels would be exacerbated if remote control were added because remote control is less precise, 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

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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.

374. The generalized statement in paragraph [0043] of Bennett-II that its "vehicle 10 may be operated by remote control" would not inform a POSITA that Puck's remote-control system could successfully be modified to control Bryham's 3-wheeled ground engagement system, which is substantially different from Bennett's drivetrain. Moreover, a POSITA would consider Bryham's 3-wheeled ground engagement system to be even less stable and provide considerably worse traction and steering than the pair of tracks disclosed in Bennett-II. As a result, a POSITA would have greater reservations in adding remote control to Bryham's 3-wheeled ground engagement system than adding remote control to Bennett-II.

B. Claim 2

375. Claim 2 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claim 1 obvious. Claim 2 is not obvious at least because of its dependence on Claim 1.

C. Claim 3

376. Claim 3 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the conduit comprises an opening at an end thereof." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1 and 2 obvious. Claim 3 is not obvious at least because of its dependence on Claims 1 and 2.

D. Claim 4

377. Claim 4 depends from Claim 3 and recites: "The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, and 3 obvious.

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Claim 4 is not obvious at least because of its dependence on Claims 1, 2, and 3.

E. Claim 5

378. Claim 5 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, and 4 obvious. Claim 5 is not obvious at least because of its dependence on Claims 1, 2, 3, and 4.

F. Claim 6

379. Claim 6 depends from Claim 2 and recites: "The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1 and 2 obvious. Claim 6 is not obvious at least because of its dependence on Claims 1 and 2.

G. Claim 7

380. Claim 7 depends from Claim 1 and recites: "The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claim 1 obvious. Claim 7 is not obvious at least because of its dependence on Claim 1.

H. Claim 8

381. Claim 8 depends from Claim 1 and recites: "The vehicle of claim 1, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claim 1 obvious. Claim 8 is not obvious at least because of its dependence on Claim 1.

I. Claim 9

382. Claim 9 depends from Claim 8 and recites: "The vehicle of claim 8, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least

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one of speed and direction of the vehicle when the vehicle is floating." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1 and 8 obvious. Claim 9 is not obvious at least because of its dependence on Claims 1 and 8.

J. Claim 10

383. Claim 10 depends from Claim 4 and recites: "The vehicle of claim 4, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, and 4 obvious. Claim 10 is not obvious at least because of its dependence on Claims 1 and 4.

K. Claim 11

384. Claim 11 depends from Claim 10 and recites: "The vehicle of claim 10, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4 and 10 obvious. Claim 11 is not obvious at least because of its dependence on Claims 1, 2, 3, 4 and 10.

L. Claim 12

385. Claim 12 depends from Claim 4 and recites: "The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, and 4 obvious. Claim 12 is not obvious at least because of its dependence on Claims 1, 2, 3, and 4.

M. Claim 13

386. Claim 13 depends from Claim 12 and recites: "The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed." As described above, the combination of Puck,

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Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, and 12 obvious. Claim 13 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, and 12.

387. Puck lacks a ground engaging propulsion structure and a hydraulic motor. Puck also does not describe that its wireless remote control can control a hydraulic motor. Dr. Winkel asserts that the "land-based propulsion system of Bryham can be driven with hydraulic motors and can be operated at variable speed." EX1004, Winkel Decl. ¶ 367. Yet, his citations to Bryham do not support this statement.

388. Dr. Winkel references the "clutch and torque converter or gearing system" of Bryham. *Id*. (quoting EX1015, col. 6, ln. 66-col. 7, ln. 2). However, a clutch, torque converter, or gearing system are in no way a hydraulic motor as claimed. And Dr. Winkel provides no explanation as to how a POSITA would consider them to be a hydraulic motor. He goes on to assert that "[o]peration of the clutch and torque converter or gearing system would result in a variation of the speed of the hydraulic motor and ground engaging propulsion structure." *Id*. But this statement is also entirely unsupported by Bryham. There is nothing in Bryham that describes a clutch, torque converter, or gearing system as even being connected to a hydraulic motor. In fact, Figure 19 of Bryham is the only figure that illustrates a clutch 81 and a torque converter 82:

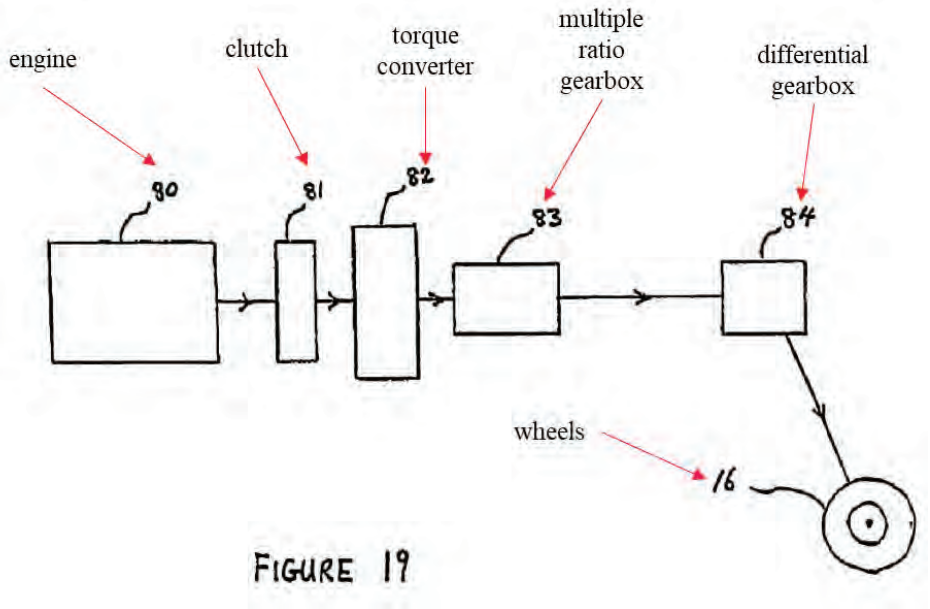


FIGURE 19

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EX1015, Fig. 19, col. 15, ln. 25-32. Absent from this from this Figure 19 and the description of Bryham is the inclusion of a hydraulic motor in this arrangement.

389. Dr. Winkel then points to the description of Bryham with respect to Figure 23 as reciting that "hydraulic energy is used to drive an [sic] hydraulic motor 108, via valves 107, which can either drive the ground engagement means 16 directly, or via a transmission 83." EX1004, Winkel Decl. ¶ 367 (quoting EX1015 at col. 16, ln. 1-6); however, this does not advance his position. He states without support that "[o]peration of the valves would also result in a variation of the speed of the hydraulic motor(s) and ground engaging propulsion structure(s)." *Id*. But Bryham provides no description that its valves 107 are proportional or can vary the flow of hydraulic fluid to the hydraulic motor 108 such that hydraulic motor 108 could be operated at variable speed. Instead, the valves 107 could simply be valves to turn ON or turn OFF the flow of hydraulic fluid (thus fully OPEN or fully CLOSED).

390. Therefore for at least these additional reasons, the combination of Puck, Bryham, and Bennett-II does not render Claim 13 obvious.

N. Claim 14

391. Claim 14 depends from Claim 13 and recites: "The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, 12, and 13 obvious. Claim 14 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, and 13.

O. Claim 15

392. Claim 15 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the ground engaging propulsion structure comprises at least two powered wheels." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, 12, 13, and 14 obvious. Claim 15 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

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P. Claim 16

393. Claim 16 depends from Claim 14 and recites: "The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, 12, 13, and 14 obvious. Claim 16 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, and 14.

Q. Claim 17

394. Claim 17 depends from Claim 16 and recites: "The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, 12, 13, 14, and 16 obvious. Claim 17 is not obvious at least because of its dependence on Claims 1 and 13.

R. Claim 18

395. Claim 18 depends from Claim 17 and recites: "The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17 obvious. Claim 18 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

S. Claim 19

396. Claim 19 depends from Claim 17 and recites: "The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, or 17 obvious. Claim 19 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

T. Claim 20

397. Claim 20 depends from Claim 17 and recites: "The vehicle of claim 17, further

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comprising a plurality of fluid nozzles fluidly connected to the fluid pump." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, or 17 obvious. Claim 20 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, and 17.

U. Claim 21

398. Claim 21 depends from Claim 20 and recites: "The vehicle of claim 20, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating." As described above, the combination of Puck, Bryham, and Bennett-II does not render Claims 1, 2, 3, 4, 12, 13, 14, 16, 17 or 20 obvious. Claim 19 is not obvious at least because of its dependence on Claims 1, 2, 3, 4, 12, 13, 14, 16, 17 and 20.

XVII. GROUND 6: CLAIMS 1-21 ARE NOT ANTICIPATED BY LYSENG

399. Lyseng [EX1019] appears to be an August 29, 2013 article describing the Patent Owner's own commercial embodiment of the patented vehicle. Lyseng does not appear to be prior art to the '425 Patent because it is dated August 29, 2013 – which is ten days **after** the Patent Owner filed its provisional patent application on August 19, 2013. I understand that, in its institution decision, the Board has also determined that Lyseng [EX1019] is also not prior art to the '425 Patent. Because this threshold issue has not been satisfied, I have not been asked to provide any opinions or analysis on Lyseng at this time, but may at a later date should the need arise.

XVIII. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

400. I understand that objective indicia of non-obviousness is independent evidence of non-obviousness. I understand that this objective indicia of non-obviousness is sometimes referred to as "secondary considerations of non-obviousness," and that when presented to the Board, it must be considered in the obviousness determination. In understanding that this evidence can show

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that an invention that appears to have been obvious was in fact, not obvious. I also understand that consideration of the objective indicia or secondary considerations of non-obviousness is not just an afterthought, but is part of the whole obviousness analysis. I further understand that the Board has stated that this evidence can often be the most probative and cogent evidence of non-obviousness. Thus, I understand that a determination of obviousness cannot be made until all evidence of secondary considerations of non-obviousness is considered.

401. I understand there are various categories of types secondary considerations of non-obviousness that can be shown. I understand these categories include: (1) commercial success of the patented invention; (2) that the patented invention satisfied a long felt but unsolved need; (3) copying of the patented invention by others; (4) that the patented invention achieved unexpected results; (5) that others in the field praised the invention; (6) that others sought or obtained rights to the patent from the patent holder; (7) that POSITAs expressed surprise at the making of the invention; and (8) that the inventor proceeded contrary to accepted wisdom.

402. I further understand the evidence of secondary considerations of non-obviousness must also have nexus to the claims. I understand "nexus" to mean there be a factually and legally sufficient connection between the evidence of secondary considerations of non-obviousness and the patented invention. Moreover, I understand this nexus is presumed when the evidence of secondary considerations of non-obviousness is tied to a specific product and that product embodies the claimed features and is coextensive with them.

403. I have been asked to address some of these secondary considerations of non-obviousness. It is my understanding that Ian Nuhn, the named inventor of the invention claimed in the '425 Patent is addressing some of these secondary considerations of non-obviousness as well. I have also been asked to give my opinion as to whether Nuhn's Lagoon Crawlers embody the features claimed in the '425 Patent and are coextensive with the claimed features.

A. Nexus

404. It is my understanding that Nuhn has produced and sold various generations of its

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Lagoon Crawlers since early 2014. In particular, I understand that Nuhn produced and sold a first generation ("Gen 1") Lagoon Crawler covering model years 2014-2017 ("MY2014-MY2017"). I understand that Nuhn produced and sold a second generation ("Gen 2") Lagoon Crawler covering model years 2018-2019 ("MY2018-MY2019"). I also understand that Nuhn produced and sold a third generation ("Gen 3") Lagoon Crawler covering model years 2020-2022 ("MY2020-MY2022"). I understand that Nuhn also produces the Crawler X covering model years 2022 to the present.

1. NUHN'S GEN 1 LAGOON CRAWLER (MY2014-MY2017)

405. It is my opinion that the claims of the '425 Patent cover Nuhn's Gen 1 Lagoon Crawler and that Nuhn's Gen 1 Lagoon Crawler is commensurate with the scope of the claims of the '425 Patent.

i. "An amphibious vehicle"

406. The Gen 1 Lagoon Crawler is an amphibious vehicle.

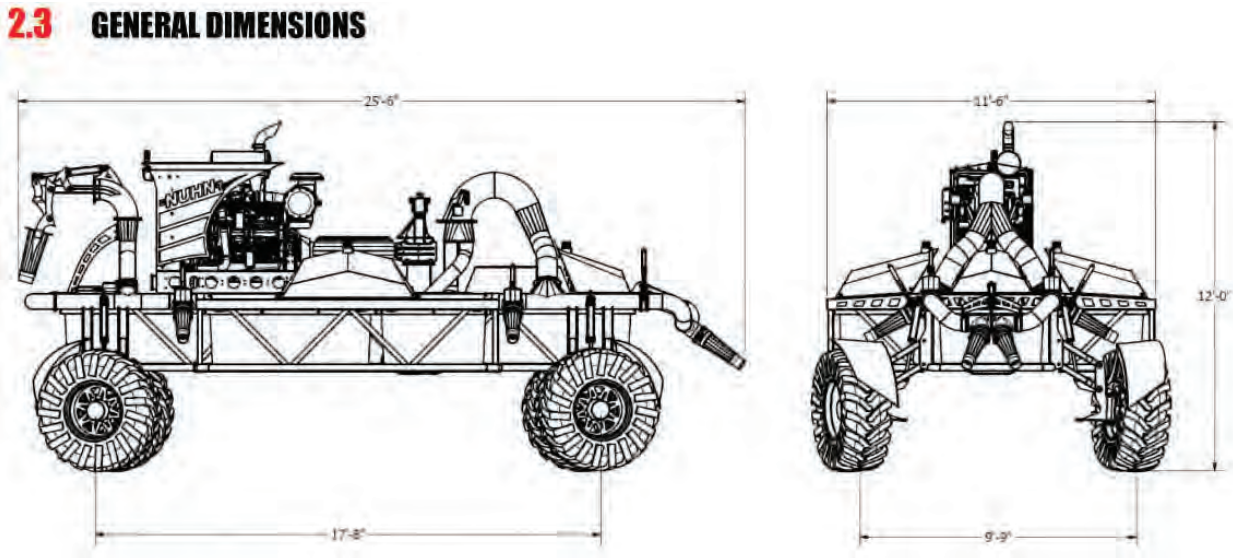
407. For example, the brochure for the MY2017 of the Gen 1 Lagoon Crawler shows it floating in liquid manure and describes that its wheels allow it to enter and exit the lagoon. EX2035 at 2, NUHN15000007258.

408. Additionally, the Operator's/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler describes driving on land [EX2036 at 12, NUHN15000046420], driving into and exiting the manure lagoon [*id*. at 13, NUHN15000046421], agitating the lagoon [*id*. at 14, NUHN15000046422], and controlling the speed and direction of the Lagoon Crawler in the manure lagoon [*id*., NUHN15000046422, *id*. at 15, NUHN15000046423].

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EX2036 at 1, NUHN15000046409.



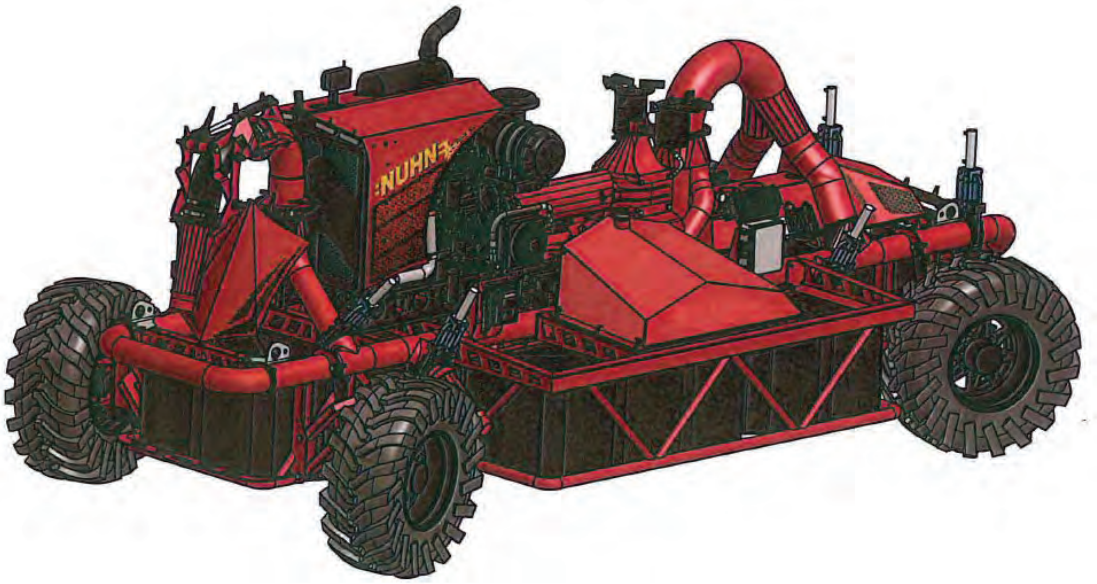
EX2036 at 5, NUHN15000046413.

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409. Thus it is my opinion that Nuhn's Gen 1 Lagoon Crawler is an "amphibious vehicle" as recited in Claim 1 of the '425 Patent.

ii. "a floatable vehicle body;"

410. The parts catalog for the Gen 1 Lagoon Crawler includes the below image of the Gen 1 Lagoon Crawler:

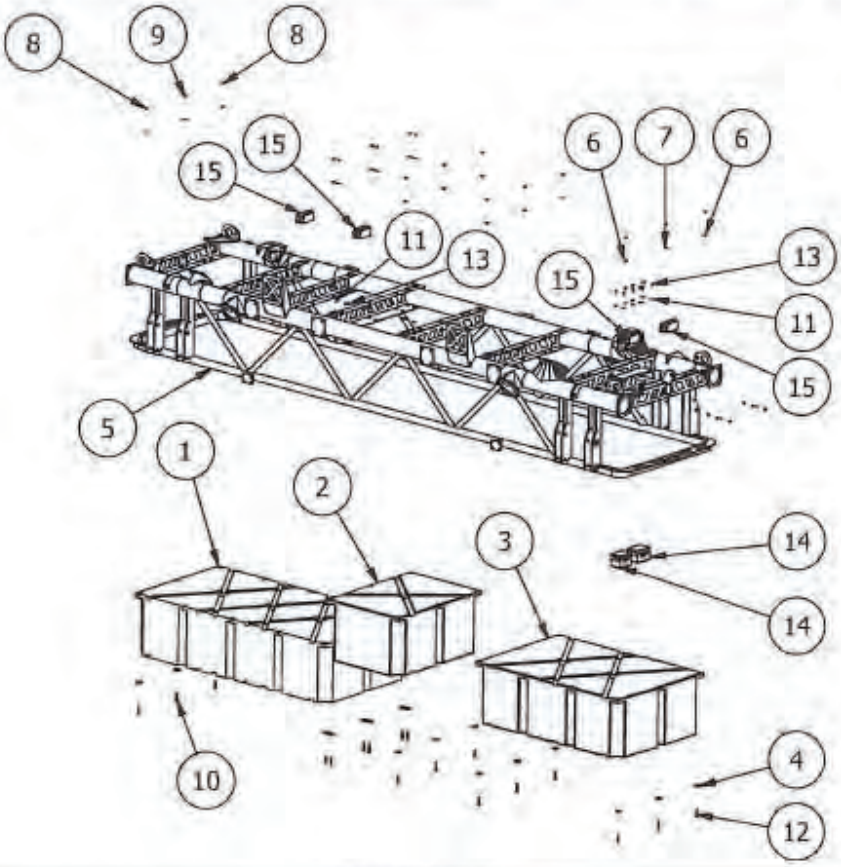


EX2037 at 1, NUHN15000049989. The parts catalog illustrates and describes the floats that are included with the Lagoon Crawler:

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NUHN — Lagoon Crawler

Crawler - Pontoon Main Frame with Floats | 100-768

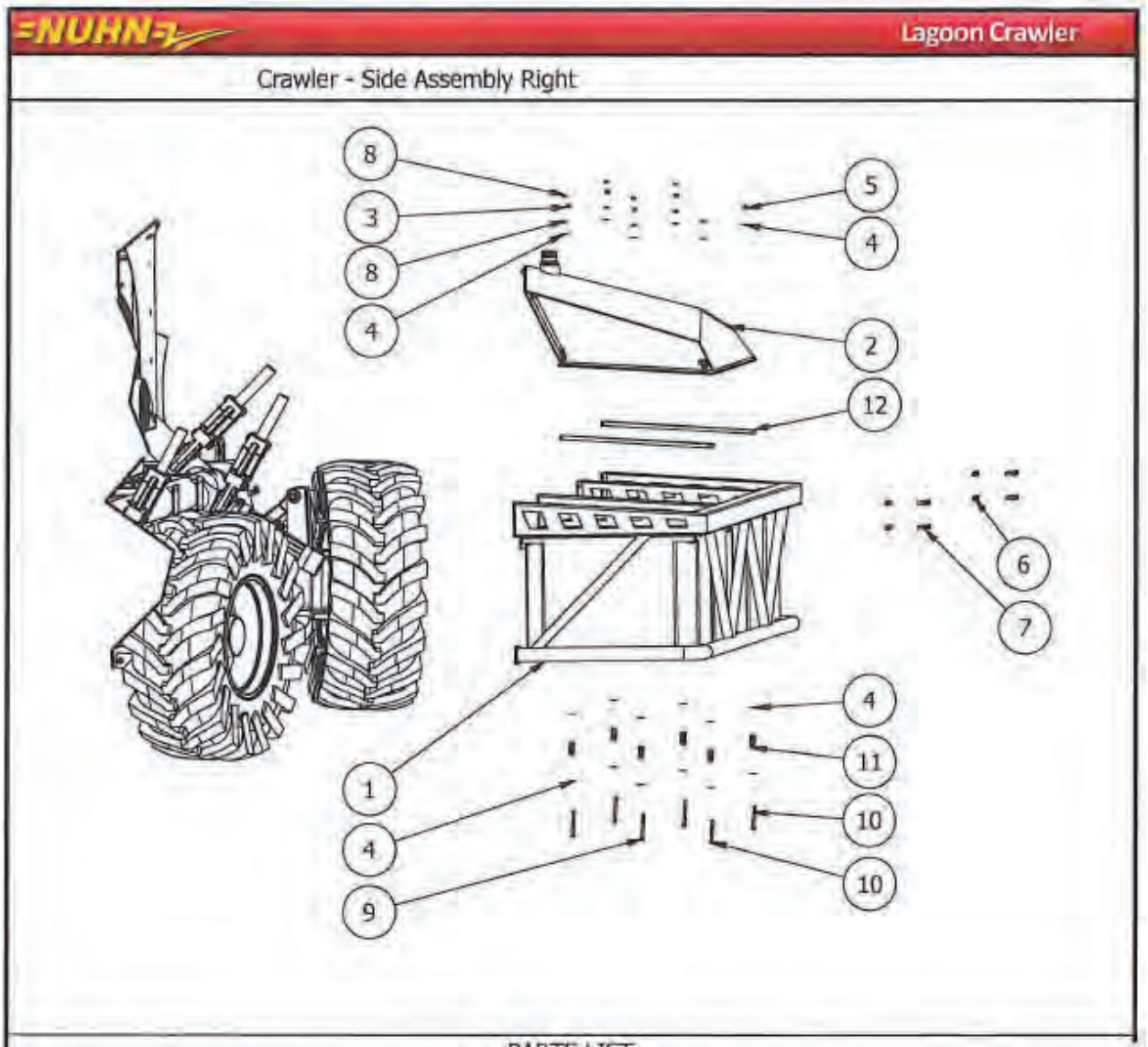


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-769	Crawler - Float - 48" x 96" x 24"
2	1	100-770	Crawler - Float - 36" x 48" x 24"
3	1	100-782	Crawler - Float - 48" x 72" x 24"
4	18	100-845	Crawler - Float Washer 2.25"OD x 0.625"ID x 0.25"
5	1	100-887	Crawler - Main Frame

EX2037 at 6, NUHN15000049994 (*see* Items 1, 2, 3).

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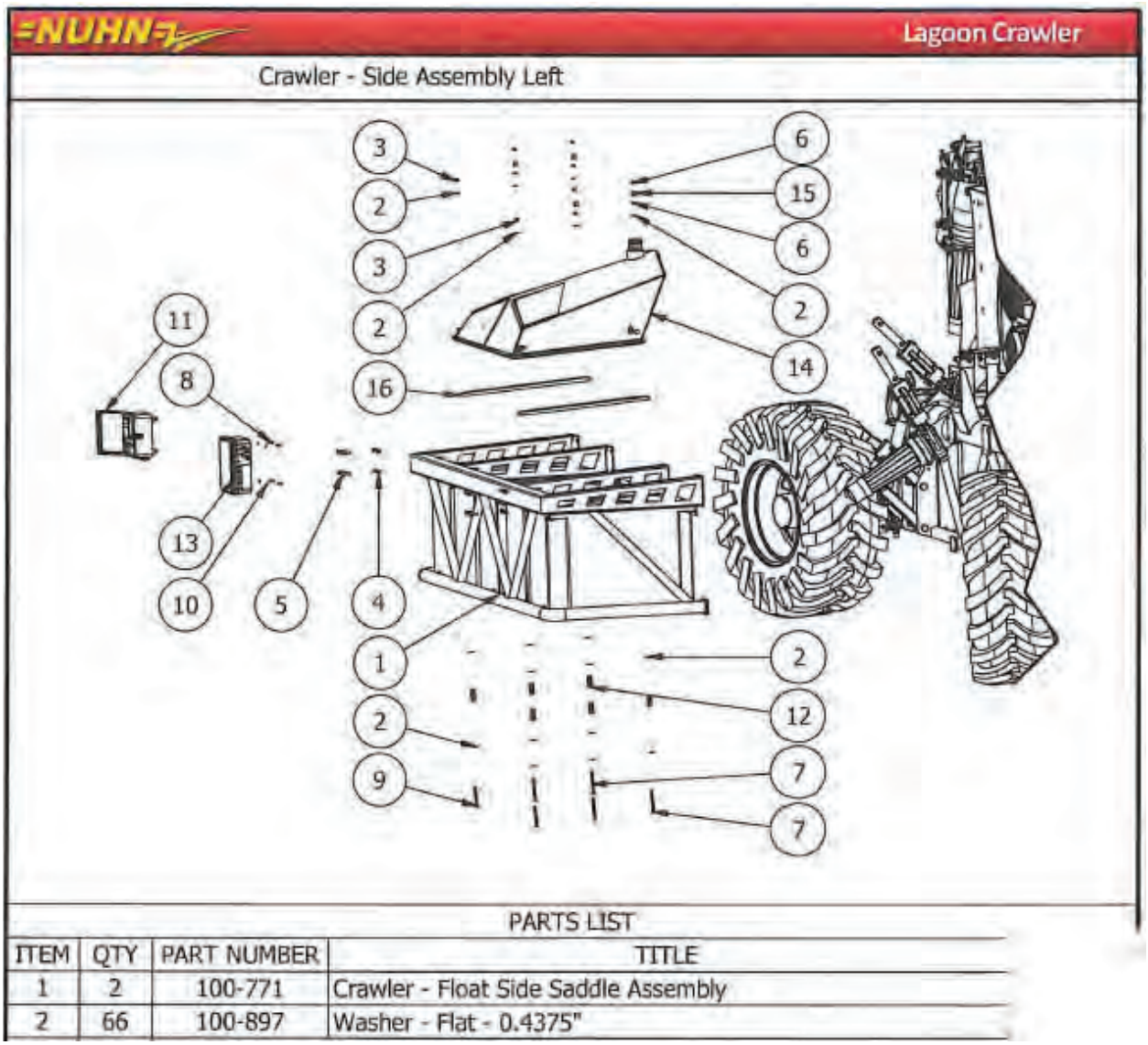


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-771	Crawler - Float Side Saddle Assembly
2	1	100-783	Crawler - Fuel Tank Complete Right

EX2037 at 12, NUHN15000050000 (*see* Item 1)

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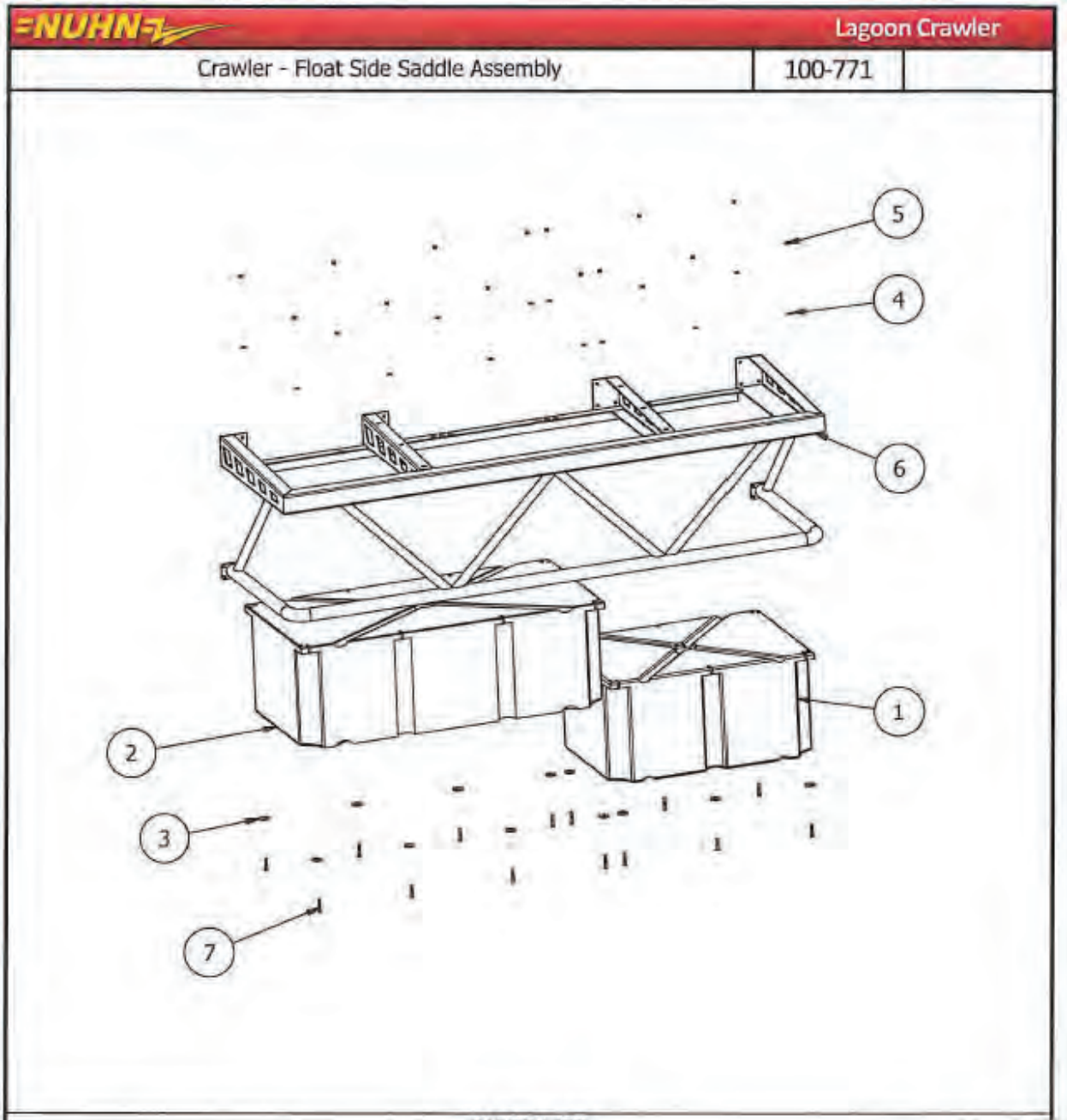


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	2	100-771	Crawler - Float Side Saddle Assembly
2	66	100-897	Washer - Flat - 0.4375"

EX2037 at 13, NUHN15000050001 (*see* Item 1).

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-770	Crawler - Float - 36" x 48" x 24"
2	1	100-776	Crawler - Float - 36" x 72" x 24"
3	14	100-845	Crawler - Float Washer 2.25"OD x 0.625"ID x 0.25"

EX2037 at 16, NUHN15000050004 (*see* Items 1, 2)

411. Thus it is my opinion that Nuhn's Gen 1 Lagoon Crawler has "a floatable vehicle body" as recited in Claim 1 of the '425 Patent.

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iii. "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor;"

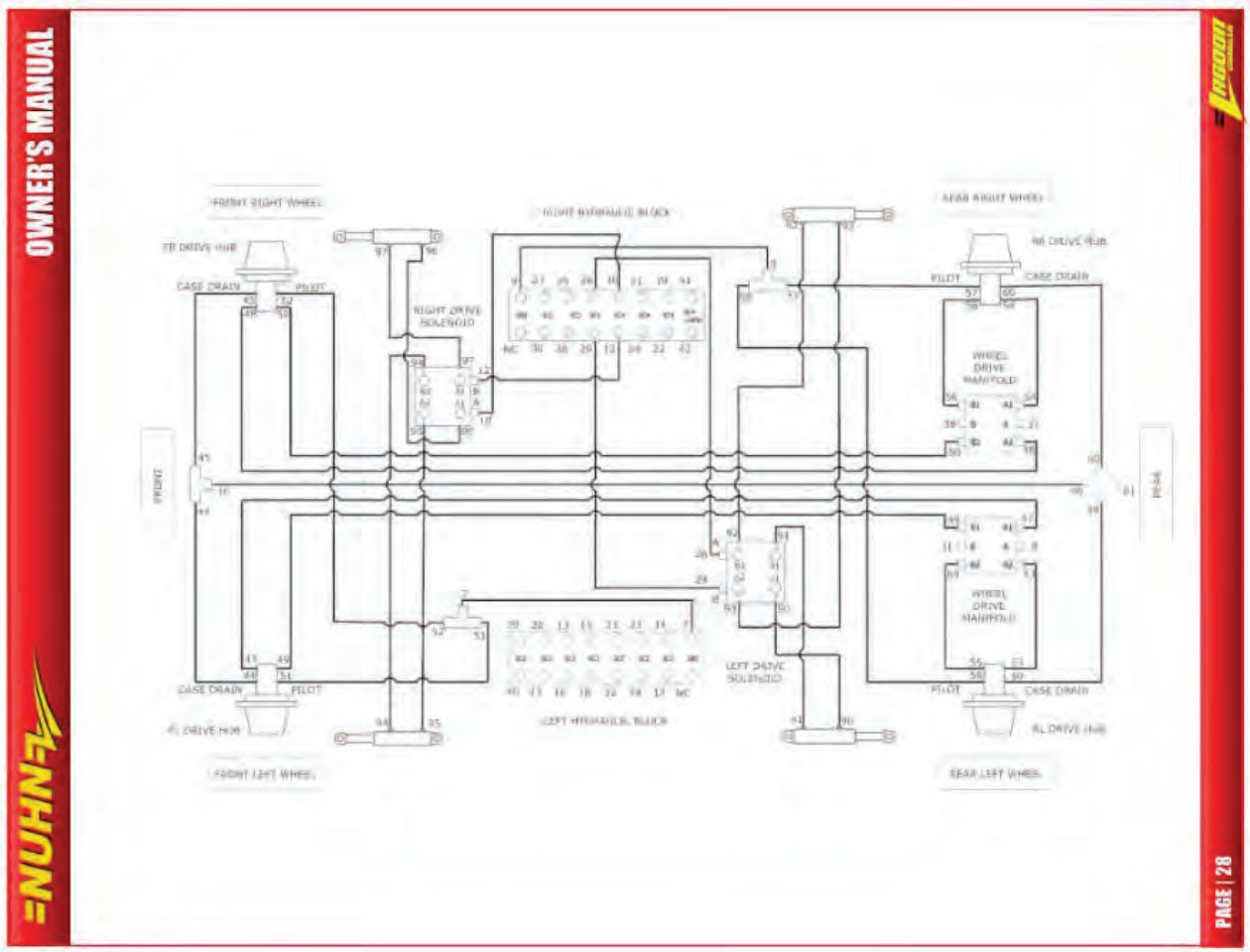
412. The Operator's/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler describes that it includes "750/50 R24 Radial Tires" and "Four-Wheel Drive" provided by "Two Speed Hydraulic Wheel Drives," with the hydraulic wheel drives having a "[h]igh torque mode for crawling out of lagoons" and a "high speed mode for transporting on land":

Drive System	Off-Road Independent A-Arm Suspension Four-Wheel Drive Four-Wheel Steering System 750/50 R24 Radial Tires Two Speed Hydraulic Wheel Drives High torque mode for crawling out of lagoons High speed mode for transporting on land

EX2036 at 6, NUHN15000046414.

413. The Operator's/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler further includes the schematics for the hydraulic system that powers the four hydraulic motors that power the four wheels, respectively:

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EX2036 at 28, NUHN15000046436.

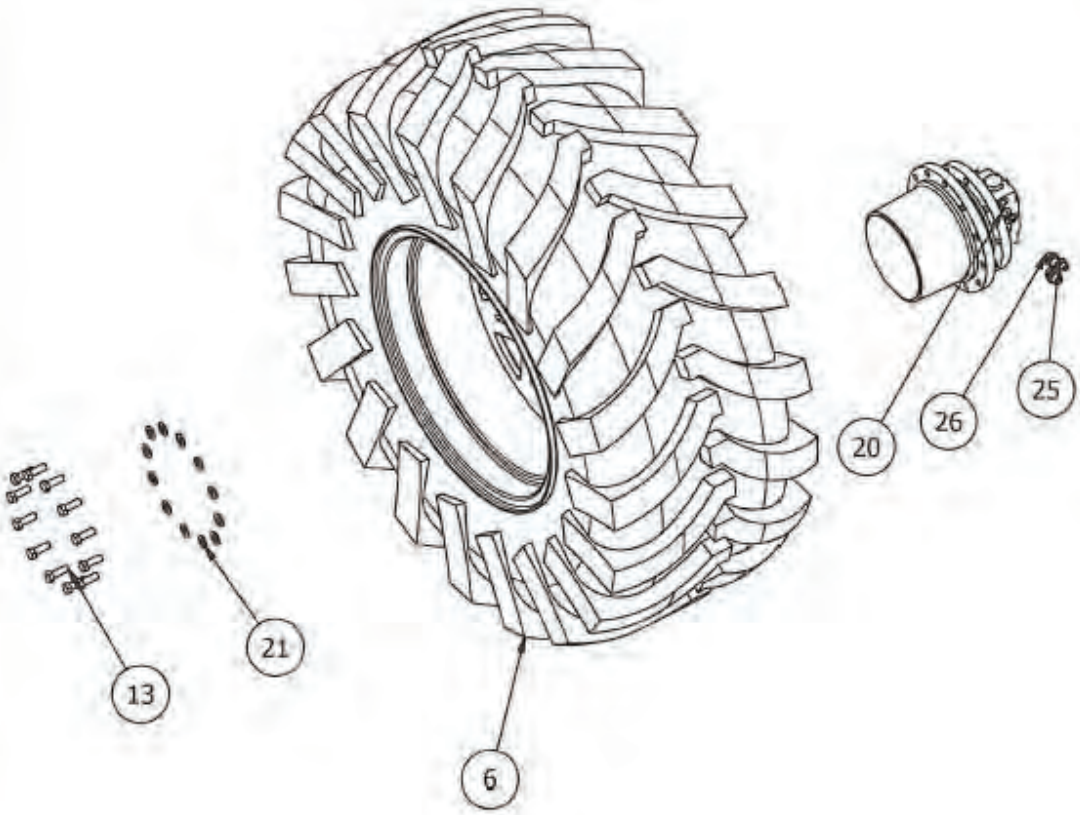
414. One of the four wheels and one of the hydraulic motors are shown in the parts catalogue for Nuhn's Gen 1 Lagoon Crawler:

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NUHN

Lagoon Crawler

Crawler - A-Arm Assembly Detail C



PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
6	4	100-779	Tire - 500-70 R24 Goodyear Assembly
13	84	100-925	Bolt - Hex Head - M14 x 40 - 8.8
20	4	103-929	Crawler - Wheel Drive
21	84	104-005	Washer - Flat - 0.5625" - GR8
25	20	104-444	Hyd. Adaptor - Straight - #4 MBSPP x #4 MORS
26	8	104-445	Hyd. Adaptor - Straight - #8 MBSPP x #8 MORS

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EX2037 at 22, NUHN15000050010 (see Items 6, 20).

415. Thus it is my opinion that Nuhn's Gen 1 Lagoon Crawler has a "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor" as recited in Claim 1 of the '425 Patent.

iv. "a fluid pump for pumping liquid manure;"

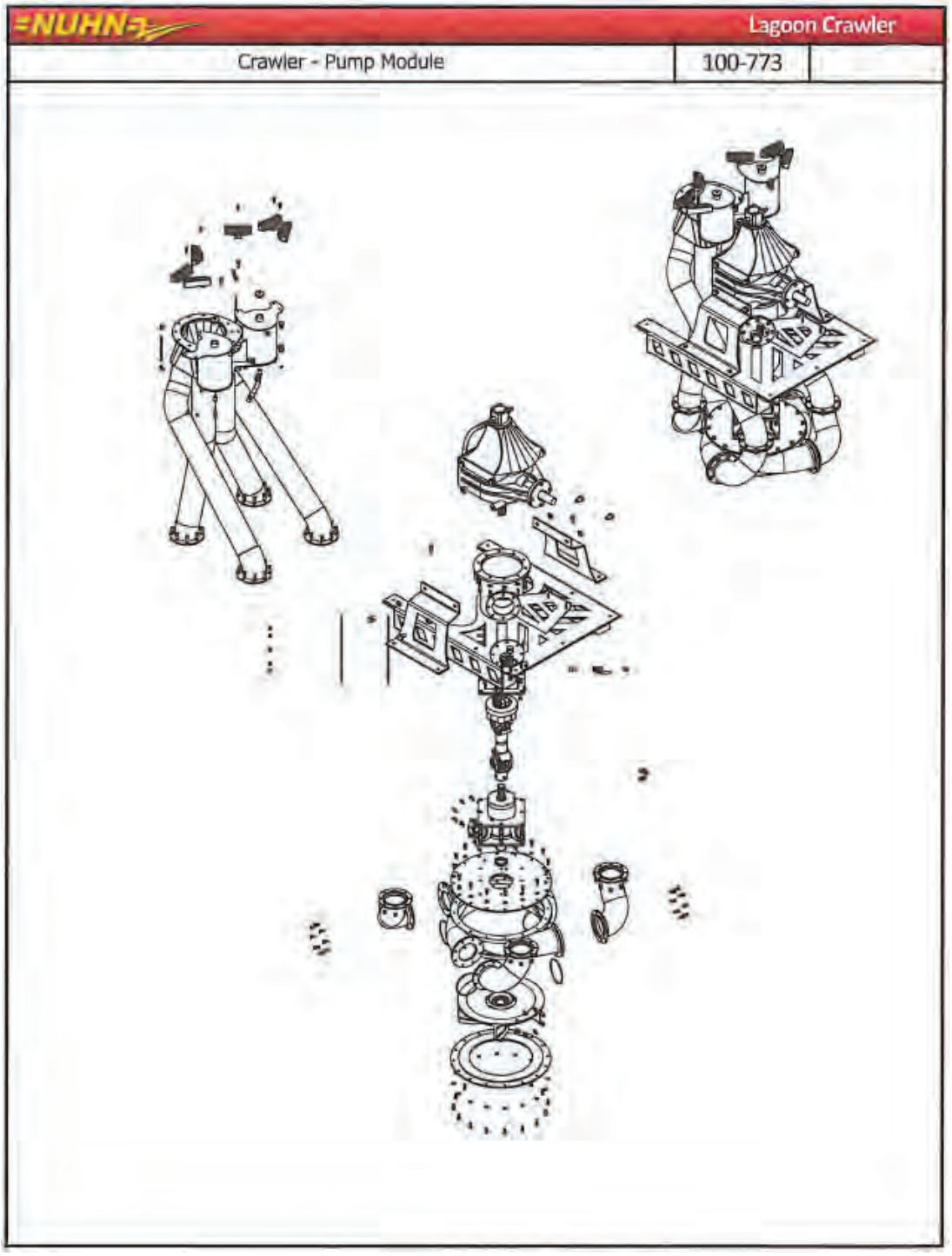
416. The Operator's/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler describes that it includes a centrifugal pump that is "[s]pecifically designed for harsh lagoon environment" and has a "[s]emi-open impellar design [that] allows large foreign material to pass through pump":

Centrifugal Pump	10" Quad Port Header Pump 10,000GPM capacity 14" pump inlet 10" pump discharge 21" diameter impeller 4 outlets off of pump housing Tungsten carbide mechanical seal *Designed to work in the harshest sand environments* *Oil bath assembly - requires very little operator maintenance* Specifically designed for harsh lagoon environment *Pump is submerged in lagoon so it will not lose its prime* *Semi-open impellor design allows large foreign material to pass through pump*

EX2036 at 6, NUHN15000046414.

417. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows the various details of the pump module with the semi-open impeller design described above:

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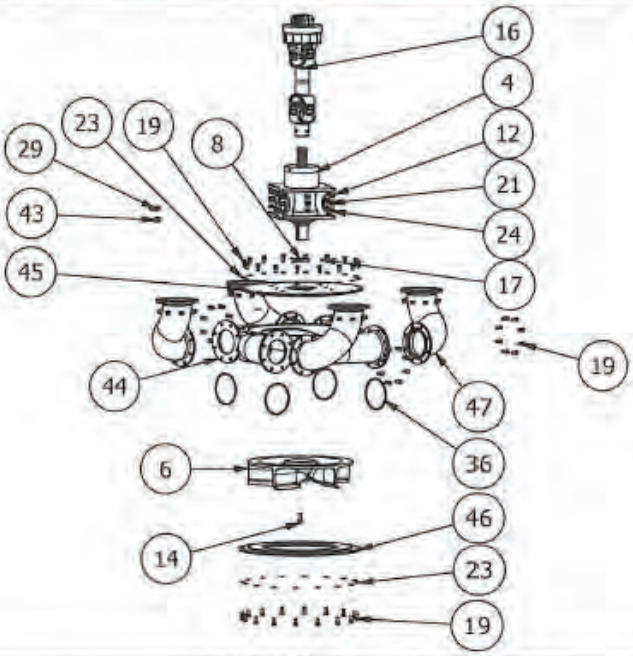


EX2037 at 51, NUHN15000050039.

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NUHN — Lagoon Crawler

Crawler - Pump Module Detail C — 100-773



PARTS LIST

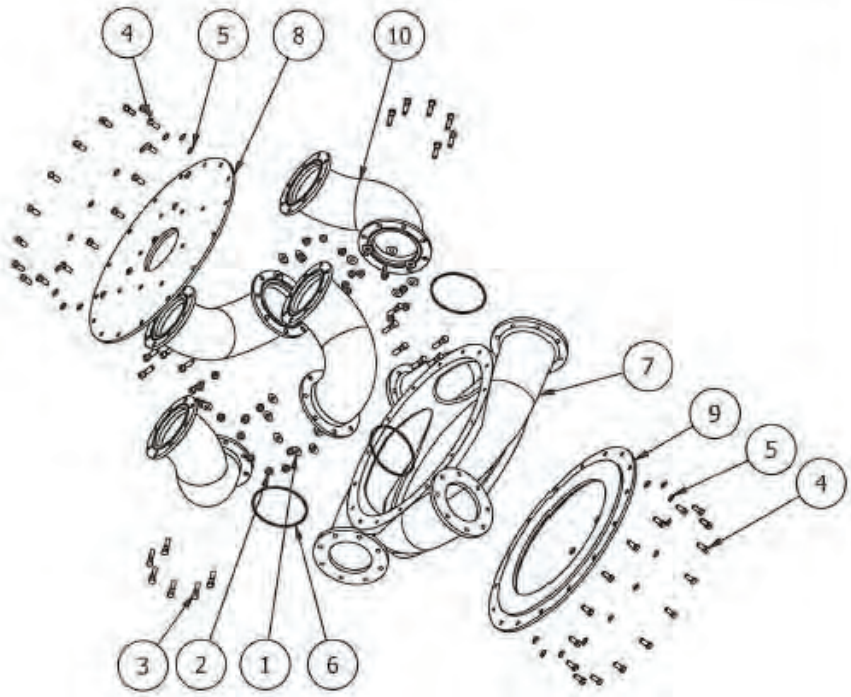
ITEM	QTY	PART NUMBER	TITLE
4	1	100-820-3	Mech-TC Seal and Bearing System - 2.25" Complete
6-1	1	100-841-2	Crawler - Impeller - 20.5"OD - 2.25" Keyed Bushing - 5 Blade
6-2	1	100-841-3	Crawler - Impeller - 20.25"OD for Cast Housing - 5 Blade
8	1	100-865	Mech-TC - Retaining Sleeve - 3"OD x 2.25"ID x 0.4"
12	8	100-905	Nut - Nylock - 0.625"
14	9	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
16	1	100-951	Crawler - Vertical Shaft with Integrated Clutch - Weasler 55
17	3	100-960	Screw - Socket Head Set - 0.25" x 0.25" Alloy - Black Oxide
19	64	101-047	Bolt - Hex Head - 0.4375" x 1" - GR5
23	32	101-186	Washer - Lock - 0.4375"
24	8	101-187	Washer - Lock - 0.625"
29	1	101-567	Hyd. Adaptor - 90° Elbow - #8 FPX x #8 MP
36	4	103-968	O-Ring - #359 DAE Buna - 6.125"OD x 5.75"ID
21	8	104-427	Bolt - Hex Head - 0.625" x 1.25" - GR5
43	1	104-471	Hyd. Adaptor - Straight - #6 MORS x #8 MOR
44	1	104-500	Crawler - Quad Port Cast - Housing - Finished
45	1	104-501	Crawler - Quad Port Cast - Top Cover
46	1	104-502	Crawler - Quad Port Cast - Inlet Cover 15" Hole
47	4	104-504	Crawler - Quad Port Header Adaptor Pipe

EX2037 at 54, NUHN15000050042.

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NUHN — Lagoon Crawler

Crawler - Cast Housing Upgrade Kit | 104-499



PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	24	100-897	Washer - Flat - 0.4375"
2	24	100-903	Nut - Nylock - 0.4375"
3	24	100-911	Bolt - Hex Head - 0.4375" x 1.75" - GR5
4	32	101-047	Bolt - Hex Head - 0.4375" x 1" - GR5
5	32	101-186	Washer - Lock - 0.4375"
6	4	103-968	O-Ring - #359 DAE Buna - 6.125"OD x 5.75"ID
7	1	104-500	10" Quad Port Housing Casting Finished
8	1	104-501	Crawler - Quad Port Cast - Top Housing Cover
9	1	104-502	Crawler - Quad Port Cast - Inlet Cover 15" Hole
10	4	104-504	Crawler - Quad Port Header Adaptor Pipe

EX2037 at 55, NUHN15000050043.

418. Another brochure for the Gen 1 Lagoon Crawler describes that the "header pump is located on the bottom of the Crawler, and is submerged at all times. That means that there are

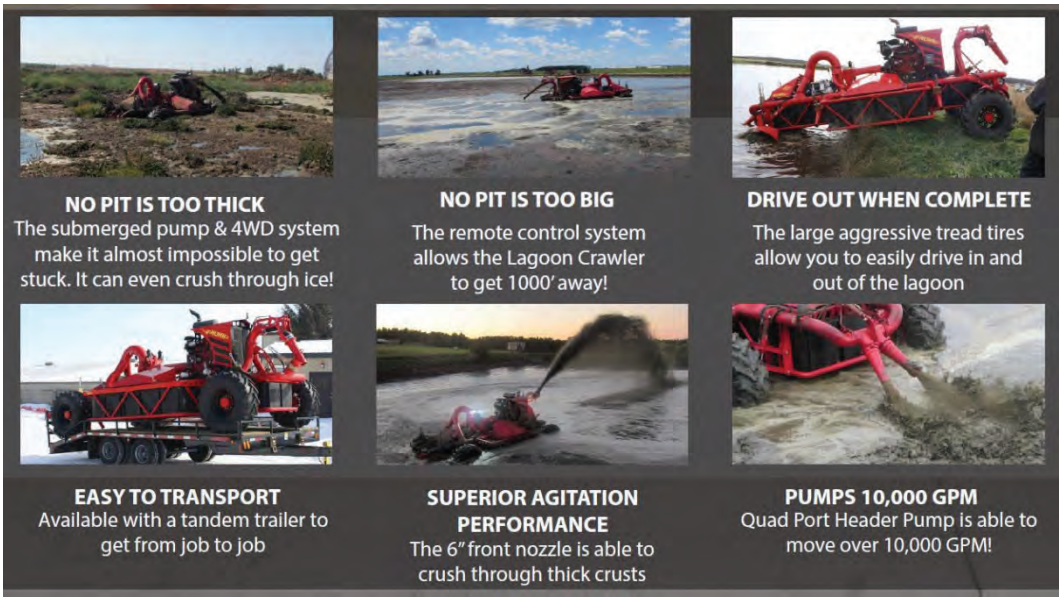
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no systems required to prime the pump":



EX2038 at 2, NUHN15000007256.

419. The same brochure states that there is "No Pit Too Thick" and that "The submerged pump & 4WD system make it almost impossible to get stuck":



EX2038 at 1, NUHN15000007255.

420. Thus it is my opinion that Nuhn's Gen 1 Lagoon Crawler has "a fluid pump for pumping liquid manure" as recited in Claim 1 of the '425 Patent.

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v. "a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump; and,"

421. The Operator's/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler describes that its power source is a Cummins QSB6.7 engine:

2.4 TECHINICAL SPECIFICATIONS

	Cummins QSB6.7 270hp @ 2,000RPM 728lb-ft @ 1,500RPM 6.7L Turbocharged and Charge Air Cooled Dual Disc Clutch

EX2036 at 6, NUHN15000046414.

422. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows the various details of the main frame assembly of Nuhn's Lagoon Crawler including the pump module (Item 1) and the engine assembly (Item 18):

NUHN Lagoon Crawler

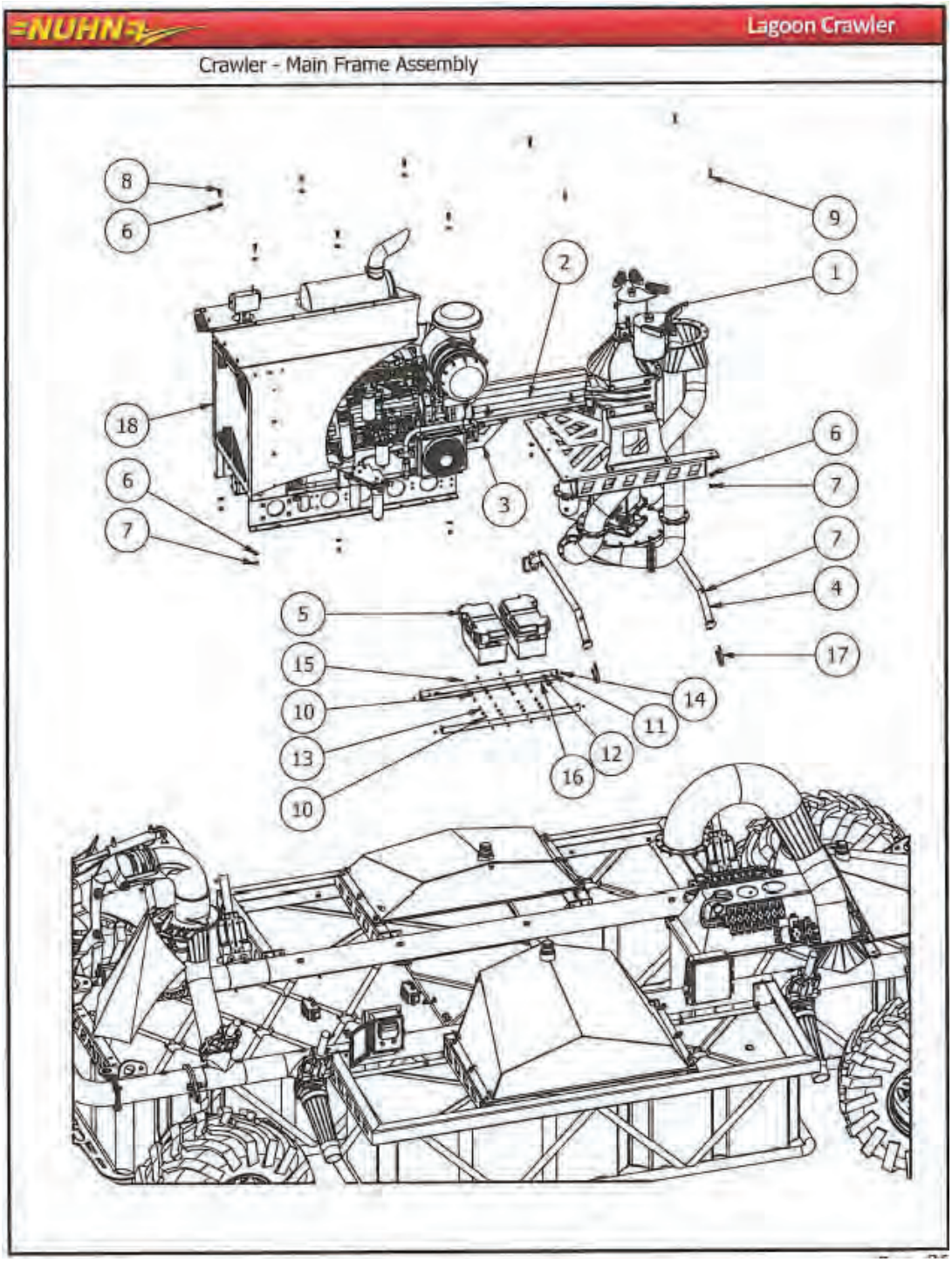
Crawler - Main Frame Assembly

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-773	Crawler - Pump Module
2	1	100-788	Crawler - PTO Shield
3	1	100-801	Crawler - PTO Shield - Front Bracket
4	2	100-804	Crawler - Cross Strut
5	2	100-818	Crawler - Battery Box Assembly
6	40	100-898	Washer - Flat - 0.5"
7	54	100-904	Nut - Nylock - 0.5"
8	38	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
9	4	100-916	Bolt - Hex Head - 0.5" x 2" - GR5
10	16	101-019	Washer - Flat - 0.25"
11	26	101-020	Washer - Flat - 0.3125"
12	9	101-026	Bolt - Hex Head - 0.3125" x 1" - GR5
13	12	101-058	Bolt - Hex Head - 0.25" x 1" - GR5
14	24	101-189	Nut - Nylock - 0.3125"
15	8	102-521	Nut - Nylock - 0.25"
16	1	103-985	Crawler - Battery Brace
17	4	104-137	Bolt - U - 0.5" x 2.5" Pipe size
18	1	104-550	Crawler - Engine - Complete Assembly

EX2037 at 40, NUHN15000050028.

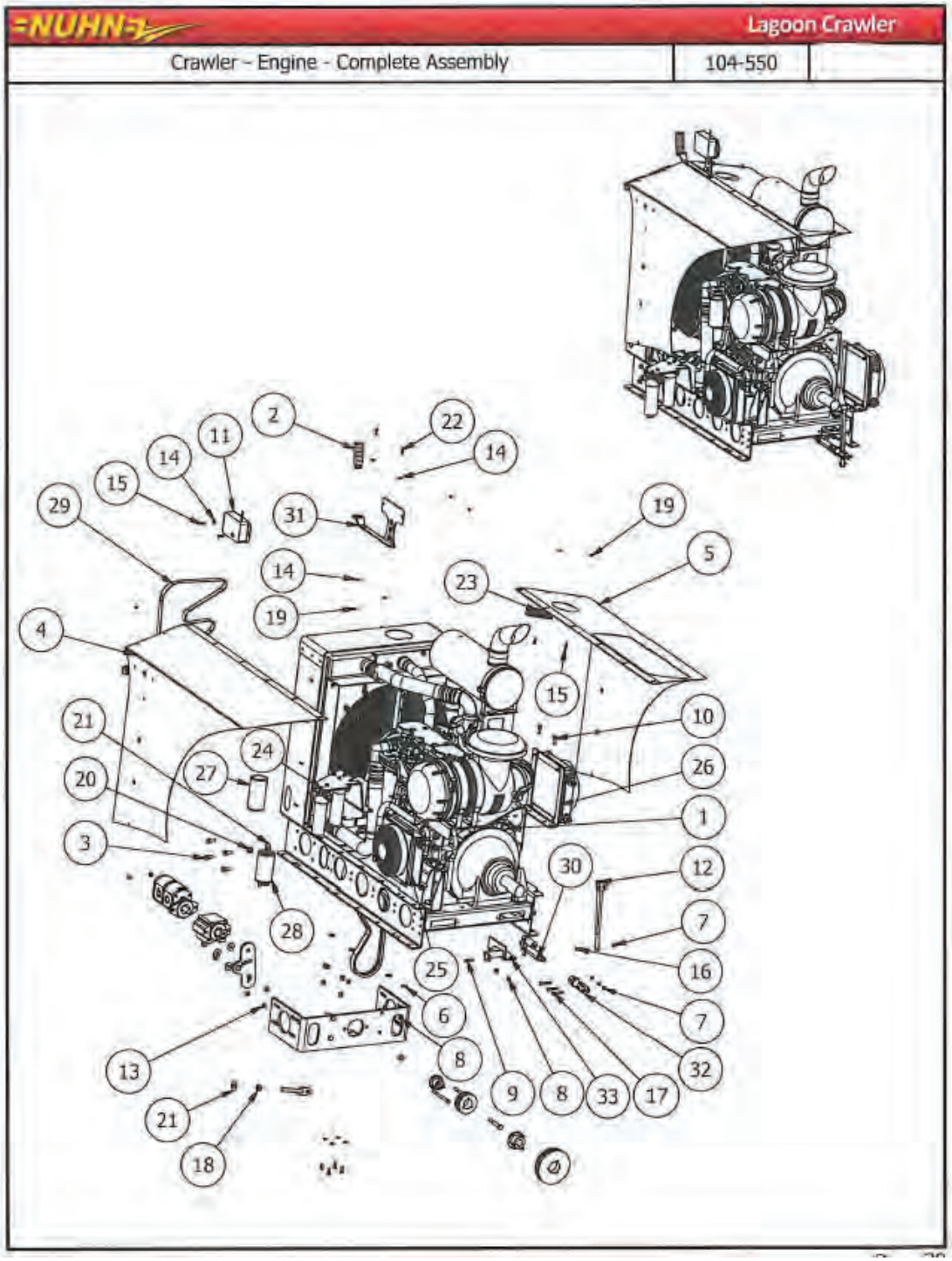
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EX2037 at 39, NUHN15000050027.

423. The engine assembly is described in the parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler as a Cummins QSB6.7 T3 and is shown below:

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EX2037 at 41, NUHN15000050029.

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NUHN Lagoon Crawler

Crawler - Engine - Complete Assembly	104-550	

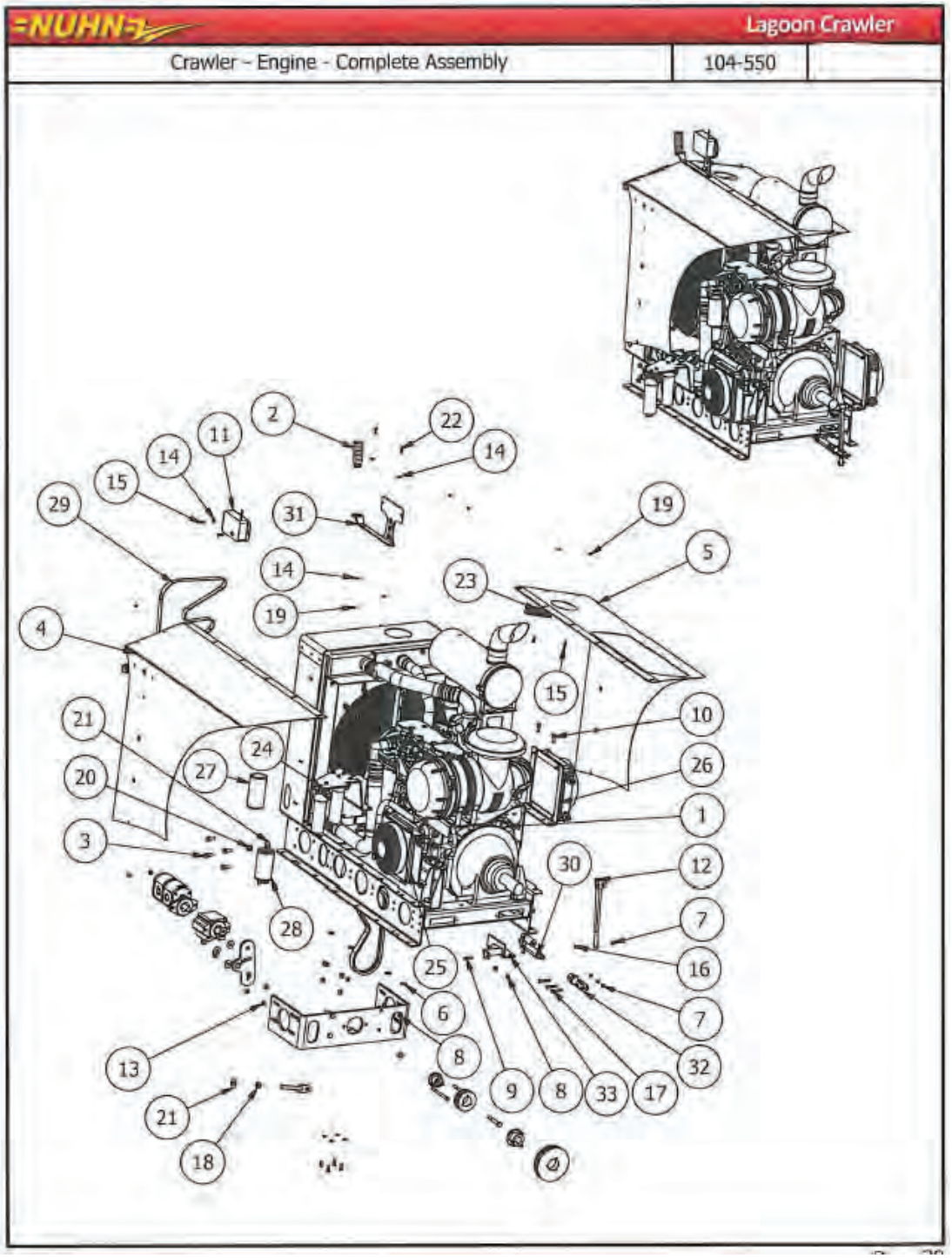
PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-666	Crawler - Engine QSB6.7 T3 Cummins
2	1	100-704	Crawler LED Tower Light - 4-Colour
3	8	100-791	Bolt - Hex Flange - 0.5" x 1.5" - GR5 Serrated
4	1	100-882	Crawler - Engine Cover - Left Side
5	1	100-883	Crawler - Engine Cover - Right Side
6	8	100-898	Washer - Flat - 0.5"
7	5	100-902	Nut - Nylock - 0.375"
8	6	100-904	Nut - Nylock - 0.5"
9	1	100-908	Bolt - Hex Head - 0.375" x 1.75" - GR5
10	6	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
11	1	100-946	Remote - Crawler - Receiver
12	1	100-947	Crawler - Engine Clutch Arm

EX2037 at 42, NUHN15000050030.

424. The power source of Nuhn's Gen 1 Lagoon Crawler is connected to a hydraulic pump. It is my understanding that the hydraulic pump is belt driven off of the engine on the radiator side of the engine. This arrangement is shown in an exploded view in the below image from the parts catalog of Nuhn's Gen 1 Lagoon Crawler:

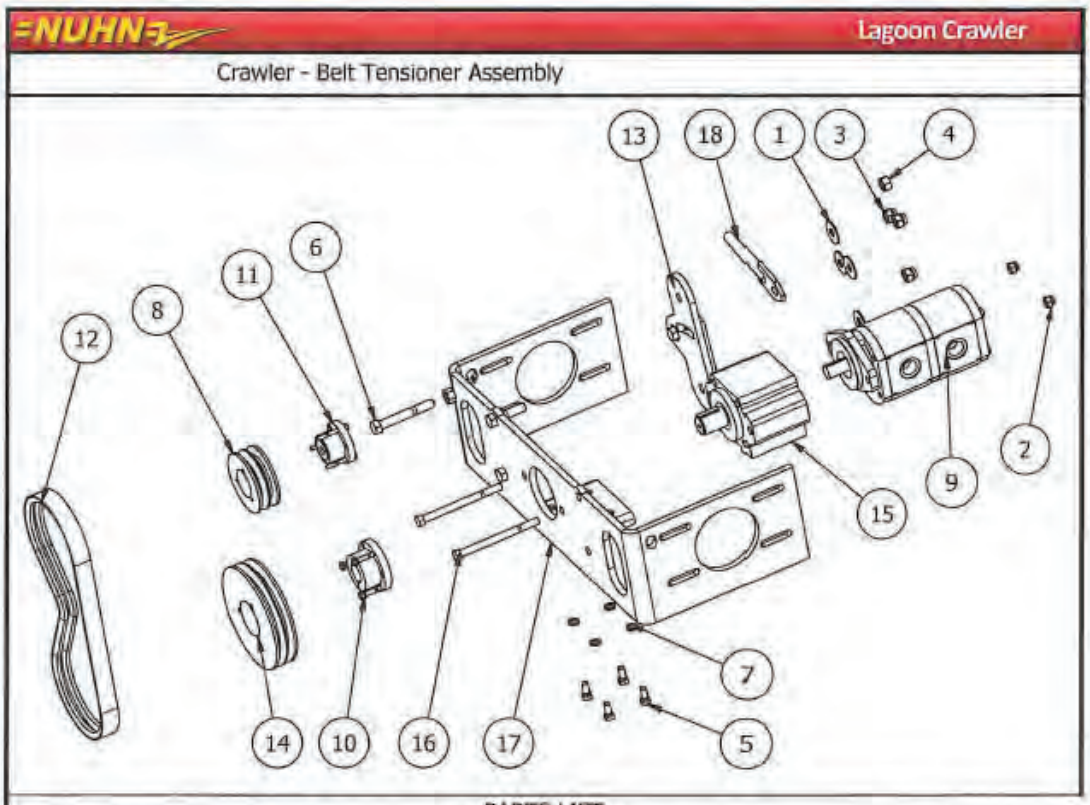
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EX2037 at 41, NUHN15000050029.

425. Additional details of the hydraulic pump and the belt tensioner assembly are shown in the parts catalog for Nuhn's Gen 1 Lagoon Crawler:

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	4	100-899	Washer - Flat - 0.625"
2	2	100-904	Nut - Nylock - 0.5"
3	3	100-905	Nut - Nylock - 0.625"
4	2	101-018	Nut - 0.625" - GR5
5	4	101-047	Bolt - Hex Head - 0.4375" x 1" - GR5
6	1	101-064	Bolt - Hex Head - 0.625" x 4.5" - GR5
7	4	101-186	Washer - Lock - 0.4375"
8	1	103-006	Crawler - Pulley 5V 465 SDS
9	1	104-032	Crawler - Hydraulic Multi Pump PLP30.2750
10	1	104-118	Crawler - Bushing Sheave 2 5V 800K Martin
11	1	104-120	Crawler - Bushing 0.625" SD-BB Martin Idler
12	1	104-206	Crawler - 2/5VX 530 Goodyear Banded Wedge Belt
13	1	104-533	Crawler - Belt Tensioner - Pulley Mount
14	1	104-278	Crawler - Martin Pulley 2 5V 800SK
15	1	104-338	Overhung Load Adaptor
16	2	104-340	Bolt - Hex Head - 0.5" x 6.5" - GR5
17	1	104-405	Crawler - Belt Tensioner Mount Main Frame
18	1	104-408	Crawler - Belt Tensioner - Rod Only

EX2037 at 46, NUHN15000050034.

426. As shown above, the hydraulic pump (Item 9) is a hydraulic multi pump PLP30.2750. *See* EX2037 at 46, NUHN15000050034. It is my understanding that this hydraulic

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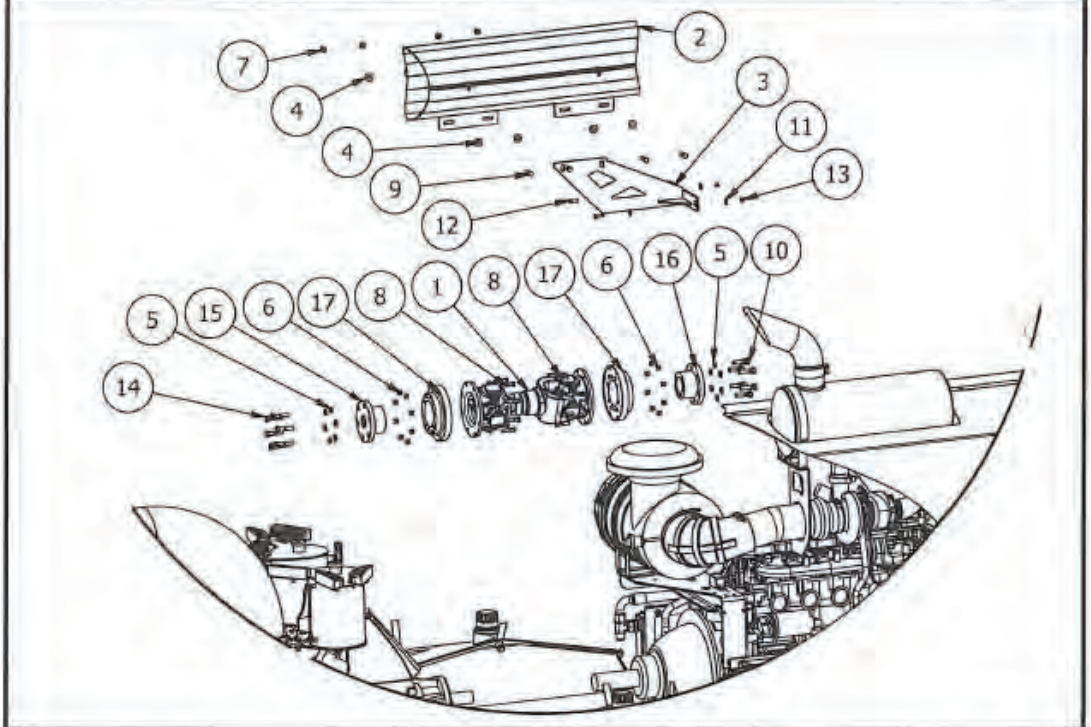
pump is hydraulically connected to the four hydraulic wheel motors. That is, I understand that when the hydraulic pump is powered by the engine, it pressurizes hydraulic fluid, which can be used to power the four hydraulic wheel motors. Thus, the power source is configured to provide power to the ground engaging propulsion structure.

427. Additionally, the power source is also configured to provide power to the fluid pump of Nuhn's Gen 1 Lagoon Crawler. Specifically, the engine is connected to and powers the fluid pump by a horizontal drive shaft assembly, a gear box assembly, and a vertical driveshaft. Each of these are shown in the parts catalog for Nuhn's Gen 1 Lagoon Crawler:

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NUHN Lagoon Crawler

Crawler - Horizontal Drive Line



PARTS LIST

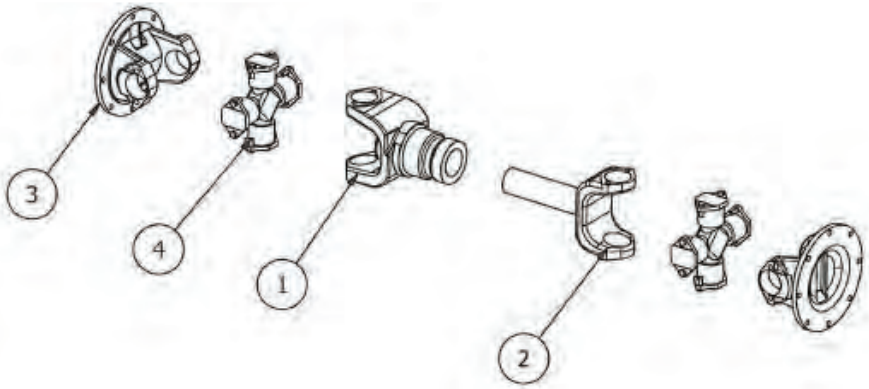
ITEM	QTY	PART NUMBER	TITLE
1	1	100-729	Crawler - Horizontal Drive Shaft Assembly - 1710 Series
2	1	100-788	Crawler - PTO Shield
3	1	100-801	Crawler - PTO Shield - Front Bracket
4	66	100-897	Washer - Flat - 0.4375"
5	12	100-900	Washer - Lock - 0.5"
6	24	100-902	Nut - Nylock - 0.375"
7	48	100-903	Nut - Nylock - 0.4375"
8	16	100-908	Bolt - Hex Head - 0.375" x 1.75" - GR5
9	20	100-910	Bolt - Hex Head - 0.4375" x 1.5" - GR5
10	6	100-915	Bolt - Hex Head - 0.5" x 1.75" - GR5
11	26	101-020	Washer - Flat - 0.3125"
12	9	101-026	Bolt - Hex Head - 0.3125" x 1" - GR5
13	24	101-189	Nut - Nylock - 0.3125"
14	6	104-319	Bolt - Hex Head - 0.5" x 2.25" - GR5
15	1	104-680	Crawler - Taper Lock Bushing - Spline (Gear Box)
16	1	104-681	Crawler - Taper Lock Bushing - Keyway (Engine)
17	2	104-682	Crawler - E Taper Lock Female to 1710

EX2037 at 48, NUHN15000050036.

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NUHN Lagoon Crawler

Crawler - Horizontal Drive Shaft Assembly - 1710 Series | 100-729



PARTS LIST

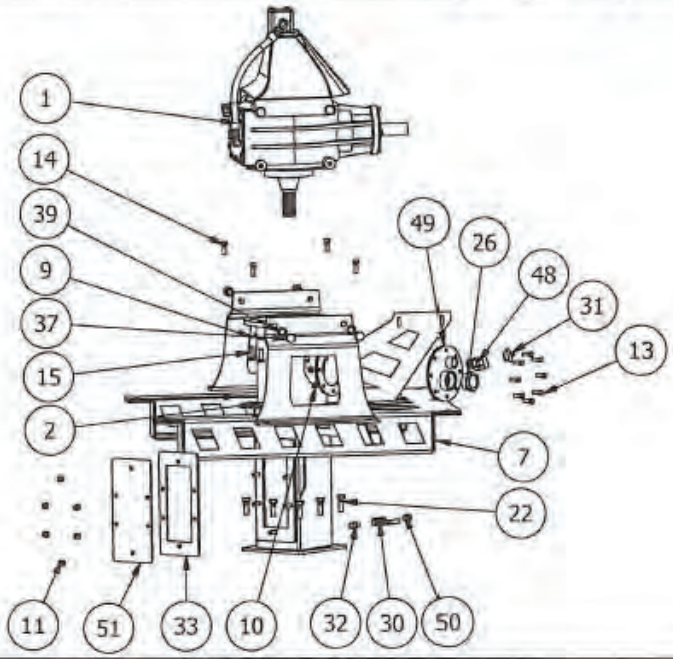
ITEM	QTY	PART NUMBER	TITLE
1	1	104-576	Crawler - 1710 Series Drive Shaft - Outer / Slip Yoke
2	1	104-577	Crawler - 1710 Series Drive Shaft - Inner / Yoke Shaft
3	2	104-578	Crawler - 1710 Series Drive Shaft - Flange Yoke
4	2	104-579	Crawler - 1710 Series Drive Shaft - Cross Kit

EX2037 at 50, NUHN15000050038.

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NUHN — Lagoon Crawler

Crawler - Pump Module Detail B — 100-773



PARTS LIST

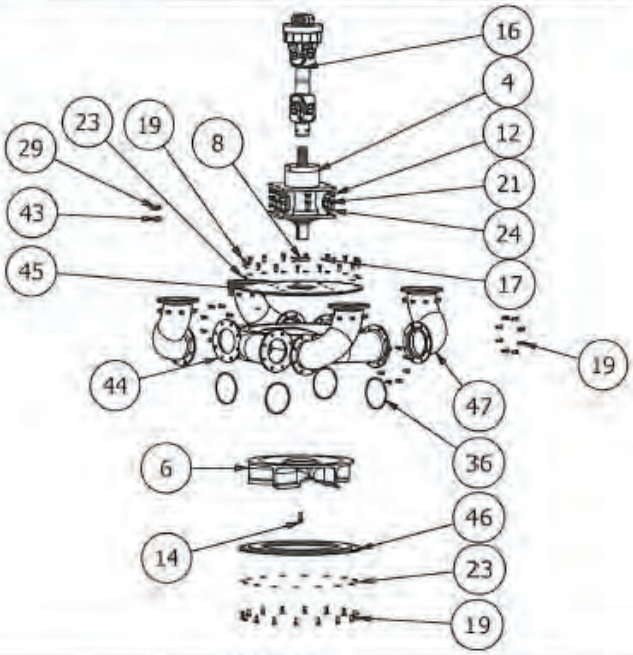
ITEM	QTY	PART NUMBER	TITLE
1	1	100-787	Crawler - Gear Box Assembly
2	2	100-797	Gear Box Mounting Bracket
7	1	100-861	Crawler - Pump Mount
9	10	100-897	Washer - Flat - 0.4375"
10	46	100-903	Nut - Nylock - 0.4375"
14	9	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
15	10	100-924	Bolt - Hex Head - M12 x 40 - 8.8
22	8	101-059	Bolt - Hex Head - 0.625" x 2" - GR5
26	1	101-449	Sight Glass - 2" Complete
30	1	102-163	Ball Valve - Brass - 0.5"
31	3	102-384	Oil Fill Cap with Hooded Breather
32	1	102-754	Pipe - Nipple - 0.5" x 1.5"
33	1	103-513	Gasket - Clean-Out Door - 15" x 7" x 0.25" - 6 Hole
37	4	104-116	Bolt - Hex Head - M20 x 30 - 8.8
39	4	104-208	Washer - Lock - M20
48	1	104-518	Hyd. Adaptor - 45° Elbow - #16 MP x #16 FP
49	1	104-519	Crawler - Sight Glass Mount
50	1	104-523	Pipe - Plug - 0.5" Hex Head
51	1	104-527	Clean-Out Door - 15" x 7" x 0.25" - 6 Hole

EX2037 at 53, NUHN15000050041.

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NUHN — Lagoon Crawler

Crawler - Pump Module Detail C — 100-773



PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
4	1	100-820-3	Mech-TC Seal and Bearing System - 2.25" Complete
6-1	1	100-841-2	Crawler - Impeller - 20.5"OD - 2.25" Keyed Bushing - 5 Blade
6-2	1	100-841-3	Crawler - Impeller - 20.25"OD for Cast Housing - 5 Blade
8	1	100-865	Mech-TC - Retaining Sleeve - 3"OD x 2.25"ID x 0.4"
12	8	100-905	Nut - Nylock - 0.625"
14	9	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
16	1	100-951	Crawler - Vertical Shaft with Integrated Clutch - Weasler 55
17	3	100-960	Screw - Socket Head Set - 0.25" x 0.25" Alloy - Black Oxide
19	64	101-047	Bolt - Hex Head - 0.4375" x 1" - GR5
23	32	101-186	Washer - Lock - 0.4375"
24	8	101-187	Washer - Lock - 0.625"
29	1	101-567	Hyd. Adaptor - 90° Elbow - #8 FPX x #8 MP
36	4	103-968	O-Ring - #359 DAE Buna - 6.125"OD x 5.75"ID
21	8	104-427	Bolt - Hex Head - 0.625" x 1.25" - GR5
43	1	104-471	Hyd. Adaptor - Straight - #6 MORS x #8 MOR
44	1	104-500	Crawler - Quad Port Cast - Housing - Finished
45	1	104-501	Crawler - Quad Port Cast - Top Cover
46	1	104-502	Crawler - Quad Port Cast - Inlet Cover 15" Hole
47	4	104-504	Crawler - Quad Port Header Adaptor Pipe

EX2037 at 54, NUHN15000050042.

428. Thus it is my opinion that Nuhn's Gen 1 Lagoon Crawler has "a power source connected to a hydraulic pump, the power source configured to provide power to both the ground

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engaging propulsion structure and the fluid pump" as recited in Claim 1 of the '425 Patent.

vi. "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 fluid 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."

429. The Operator's/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler describes that all of the machine operations are controlled through wireless remote control. It describes that the wireless remote control is 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 fluid 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:

User Interface	Complete Wireless Control All of the machine operation functions are controlled through the remote 50 hour battery life Functions: *Boat forward/reverse, as well as speed control* *Boat rotate left/right* *Boat shift left/right* *Drive forward/reverse* *Steer left/right* *Axle raise/lower* *Agitation gun movements* *Engine start/stop* *Engine throttle increase/decrease* *Clutch engage/disengage*

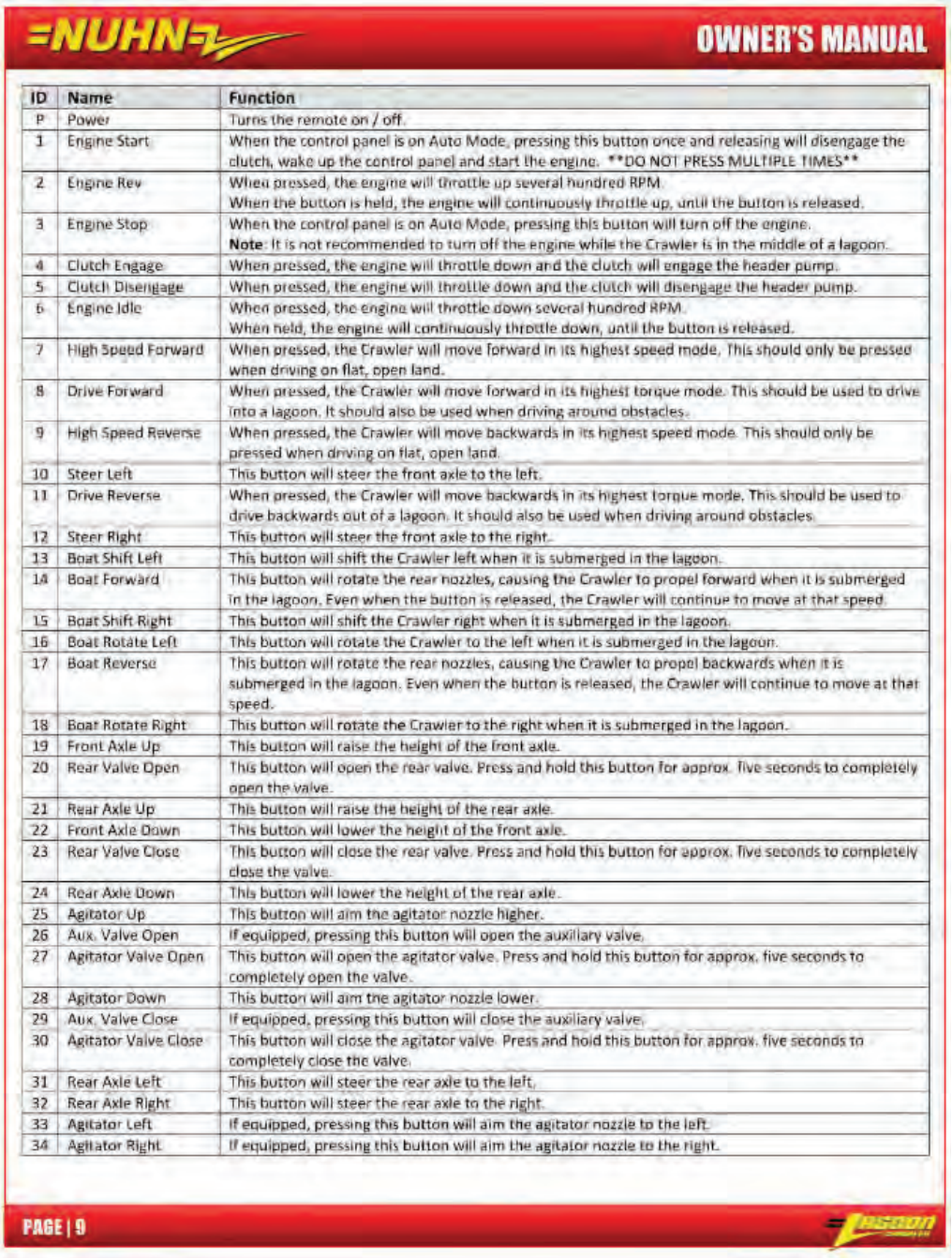
EX2036 at 6, NUHN15000046414.

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EX2036 at 8, NUHN15000046416.

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NUHN OWNER'S MANUAL

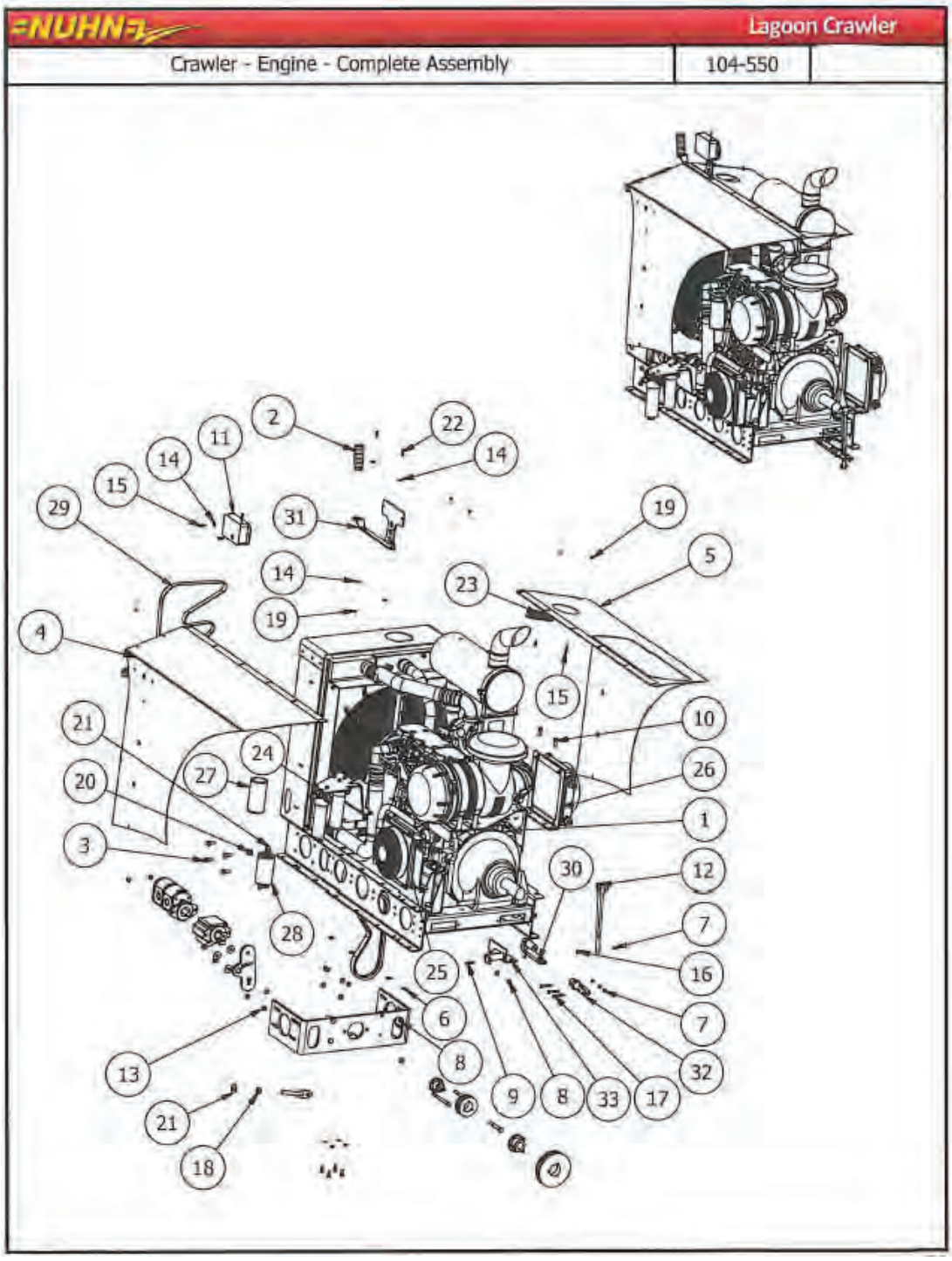
ID	Name	Function
P	Power	Turns the remote on / off.
1	Engine Start	When the control panel is on Auto Mode, pressing this button once and releasing will disengage the clutch, wake up the control panel and start the engine. **DO NOT PRESS MULTIPLE TIMES**
2	Engine Rev	When pressed, the engine will throttle up several hundred RPM. When the button is held, the engine will continuously throttle up, until the button is released.
3	Engine Stop	When the control panel is on Auto Mode, pressing this button will turn off the engine. **Note**: It is not recommended to turn off the engine while the Crawler is in the middle of a lagoon.
4	Clutch Engage	When pressed, the engine will throttle down and the clutch will engage the header pump.
5	Clutch Disengage	When pressed, the engine will throttle down and the clutch will disengage the header pump.
6	Engine Idle	When pressed, the engine will throttle down several hundred RPM. When held, the engine will continuously throttle down, until the button is released.
7	High Speed Forward	When pressed, the Crawler will move forward in its highest speed mode. This should only be pressed when driving on flat, open land.
8	Drive Forward	When pressed, the Crawler will move forward in its highest torque mode. This should be used to drive into a lagoon. It should also be used when driving around obstacles.
9	High Speed Reverse	When pressed, the Crawler will move backwards in its highest speed mode. This should only be pressed when driving on flat, open land.
10	Steer Left	This button will steer the front axle to the left.
11	Drive Reverse	When pressed, the Crawler will move backwards in its highest torque mode. This should be used to drive backwards out of a lagoon. It should also be used when driving around obstacles.
12	Steer Right	This button will steer the front axle to the right.
13	Boat Shift Left	This button will shift the Crawler left when it is submerged in the lagoon.
14	Boat Forward	This button will rotate the rear nozzles, causing the Crawler to propel forward when it is submerged in the lagoon. Even when the button is released, the Crawler will continue to move at that speed.
15	Boat Shift Right	This button will shift the Crawler right when it is submerged in the lagoon.
16	Boat Rotate Left	This button will rotate the Crawler to the left when it is submerged in the lagoon.
17	Boat Reverse	This button will rotate the rear nozzles, causing the Crawler to propel backwards when it is submerged in the lagoon. Even when the button is released, the Crawler will continue to move at that speed.
18	Boat Rotate Right	This button will rotate the Crawler to the right when it is submerged in the lagoon.
19	Front Axle Up	This button will raise the height of the front axle.
20	Rear Valve Open	This button will open the rear valve. Press and hold this button for approx. five seconds to completely open the valve.
21	Rear Axle Up	This button will raise the height of the rear axle.
22	Front Axle Down	This button will lower the height of the front axle.
23	Rear Valve Close	This button will close the rear valve. Press and hold this button for approx. five seconds to completely close the valve.
24	Rear Axle Down	This button will lower the height of the rear axle.
25	Agitator Up	This button will aim the agitator nozzle higher.
26	Aux. Valve Open	If equipped, pressing this button will open the auxiliary valve.
27	Agitator Valve Open	This button will open the agitator valve. Press and hold this button for approx. five seconds to completely open the valve.
28	Agitator Down	This button will aim the agitator nozzle lower.
29	Aux. Valve Close	If equipped, pressing this button will close the auxiliary valve.
30	Agitator Valve Close	This button will close the agitator valve. Press and hold this button for approx. five seconds to completely close the valve.
31	Rear Axle Left	This button will steer the rear axle to the left.
32	Rear Axle Right	This button will steer the rear axle to the right.
33	Agitator Left	If equipped, pressing this button will aim the agitator nozzle to the left.
34	Agitator Right	If equipped, pressing this button will aim the agitator nozzle to the right.

PAGE | 9

EX2036 at 9, NUHN15000046417.

430. The remote control receiver is shown in the parts catalog for Nuhn's Gen 1 Lagoon Crawler (see Item 11):

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EX2037 at 41, NUHN15000050029.

DocuSign Envelope ID: 10470407-E38C-4C4F-BAF2-A452840F925B

NUHN — Lagoon Crawler

Crawler - Engine - Complete Assembly		104-550	
PARTS LIST			
ITEM	QTY	PART NUMBER	TITLE
1	1	100-666	Crawler - Engine QSB6.7 T3 Cummins
2	1	100-704	Crawler LED Tower Light - 4-Colour
3	8	100-791	Bolt - Hex Flange - 0.5" x 1.5" - GR5 Serrated
4	1	100-882	Crawler - Engine Cover - Left Side
5	1	100-883	Crawler - Engine Cover - Right Side
6	8	100-898	Washer - Flat - 0.5"
7	5	100-902	Nut - Nylock - 0.375"
8	6	100-904	Nut - Nylock - 0.5"
9	1	100-908	Bolt - Hex Head - 0.375" x 1.75" - GR5
10	6	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
11	1	100-946	Remote - Crawler - Receiver
12	1	100-947	Crawler - Engine Clutch Arm

EX2037 at 42, NUHN15000050030.

431. Thus it is my opinion that Nuhn's Gen 1 Lagoon Crawler has "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 fluid 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" as recited in Claim 1 of the '425 Patent.

432. Therefore, in view of the above, it is my opinion that the claims of the '425 Patent cover Nuhn's Gen 1 Lagoon Crawler and that Nuhn's Gen 1 Lagoon Crawler is commensurate with the scope of the claims of the '425 Patent.

2. NUHN'S GEN 2 LAGOON CRAWLER (MY2018-MY2019)

433. It is my opinion that the claims of the '425 Patent cover Nuhn's Gen 2 Lagoon Crawler and that Nuhn's Gen 2 Lagoon Crawler is commensurate with the scope of the claims of the '425 Patent.

434. The brochure for the MY2018 of the Gen 2 Lagoon Crawler provides a comparison of the Gen 2 Lagoon Crawler to the last model year (MY2017) of the Gen 1 Lagoon Crawler. *See* EX2039 at 1, NUHN15000007239. After reviewing this brochure [EX2039,

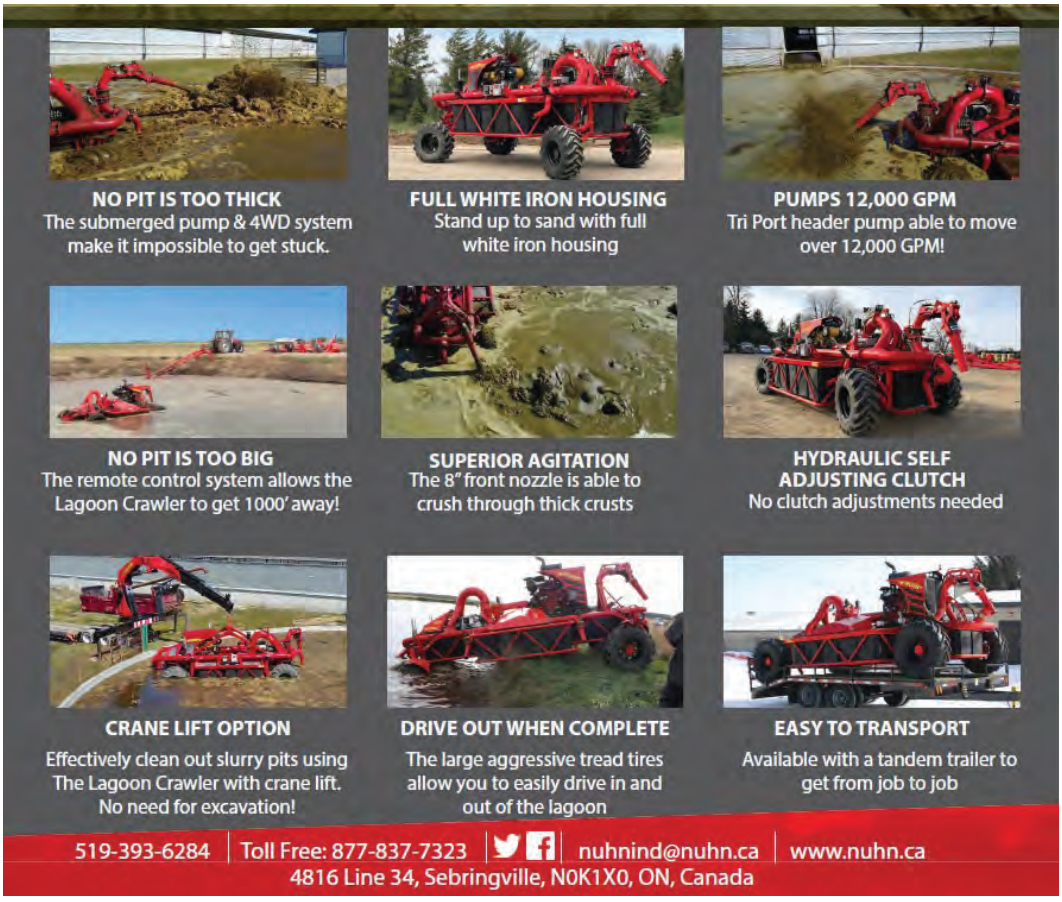
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NUHN15000007239], the Operator's/Safety Manual for the MY2019 Gen 2 Lagoon Crawler [EX2040, NUHN15000046725], and the parts book for the MY2018 Gen 2 Lagoon Crawler [EX2041, NUHN15000007311], it is my opinion that the changes made between Gen 1 and Gen 2 did not take the Gen 2 outside of the scope of the claims of the '425 Patent.

i. "An amphibious vehicle"

435. The Gen 2 Lagoon Crawler is an amphibious vehicle.

436. For example, the brochure for the MY2018 of the Gen 2 Lagoon Crawler shows it floating in liquid manure and describes that its wheels allow it to enter and exit the lagoon:



EX2039 at 2, NUHN15000007240.

437. Additionally, the Operator's/Safety Manual for the MY2018 of the Gen 2 Lagoon Crawler describes driving on land [EX2040 at 12, NUHN15000046736], driving into and exiting

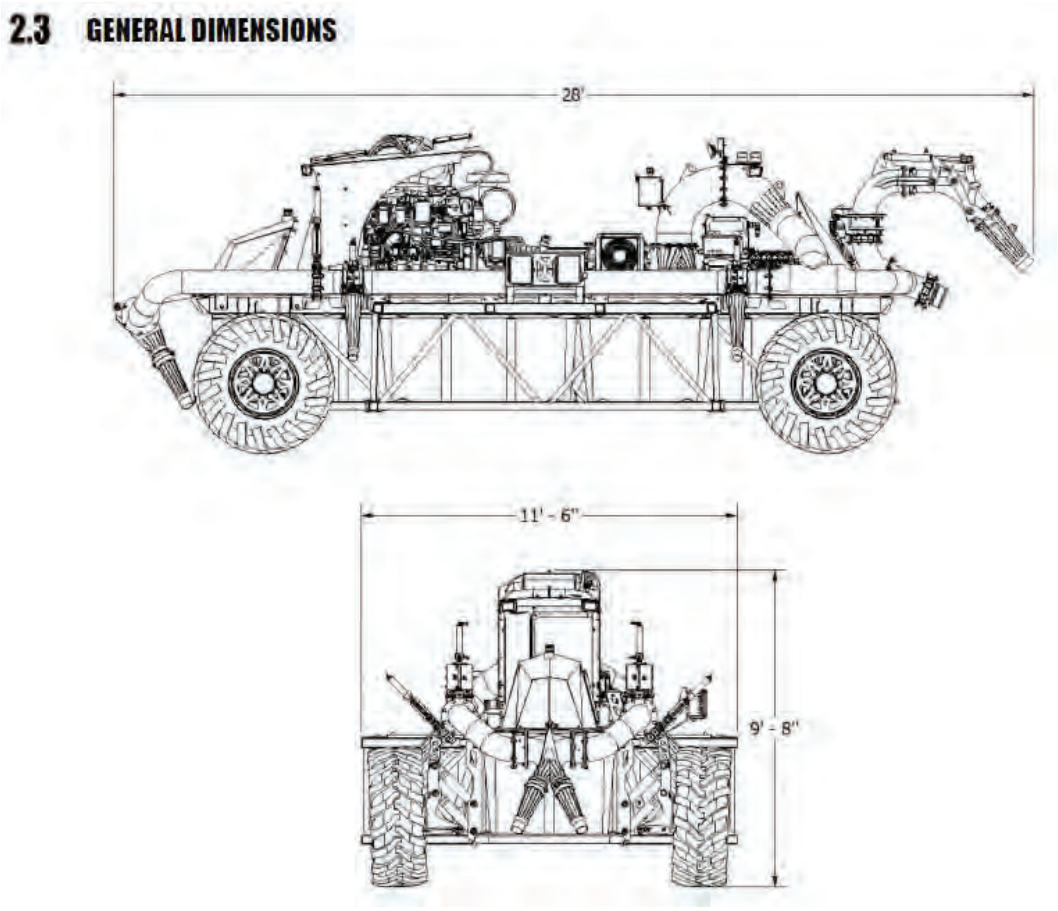
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the manure lagoon [*id*. at 13, NUHN15000046737], agitating the lagoon [*id*. at 14, NUHN15000046738], and controlling the speed and direction of the Lagoon Crawler in the manure lagoon [*id*. at 15, NUHN15000046739].



EX2040 at 1, NUHN15000046725.

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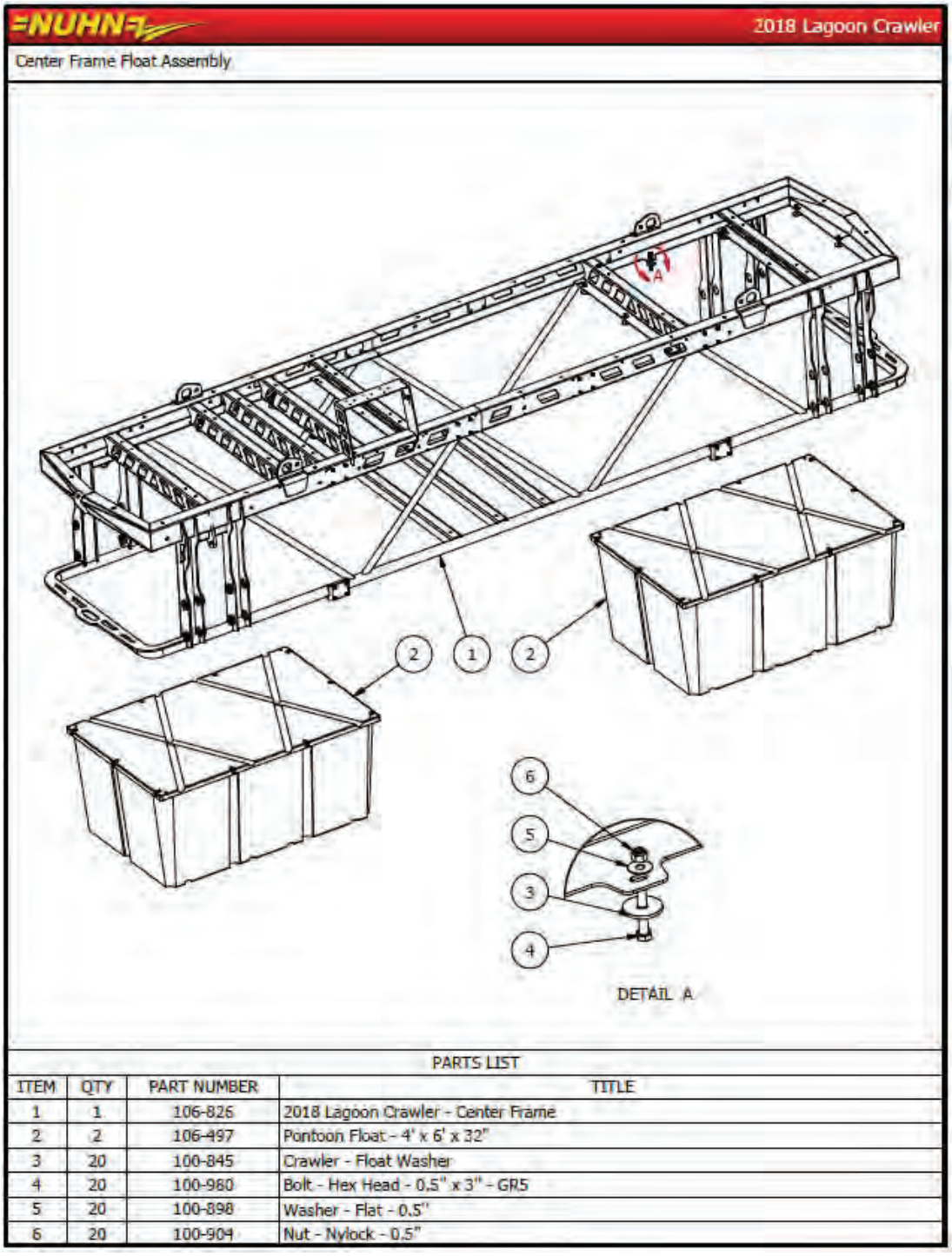
EX2040 at 5, NUHN15000046729.

438. Thus it is my opinion that Nuhn's Gen 2 Lagoon Crawler is an "amphibious vehicle" as recited in Claim 1 of the '425 Patent.

ii. "a floatable vehicle body;"

439. The parts book for the Gen 2 Lagoon Crawler illustrates and describes the floats that are included with the Lagoon Crawler:

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PARTS LIST

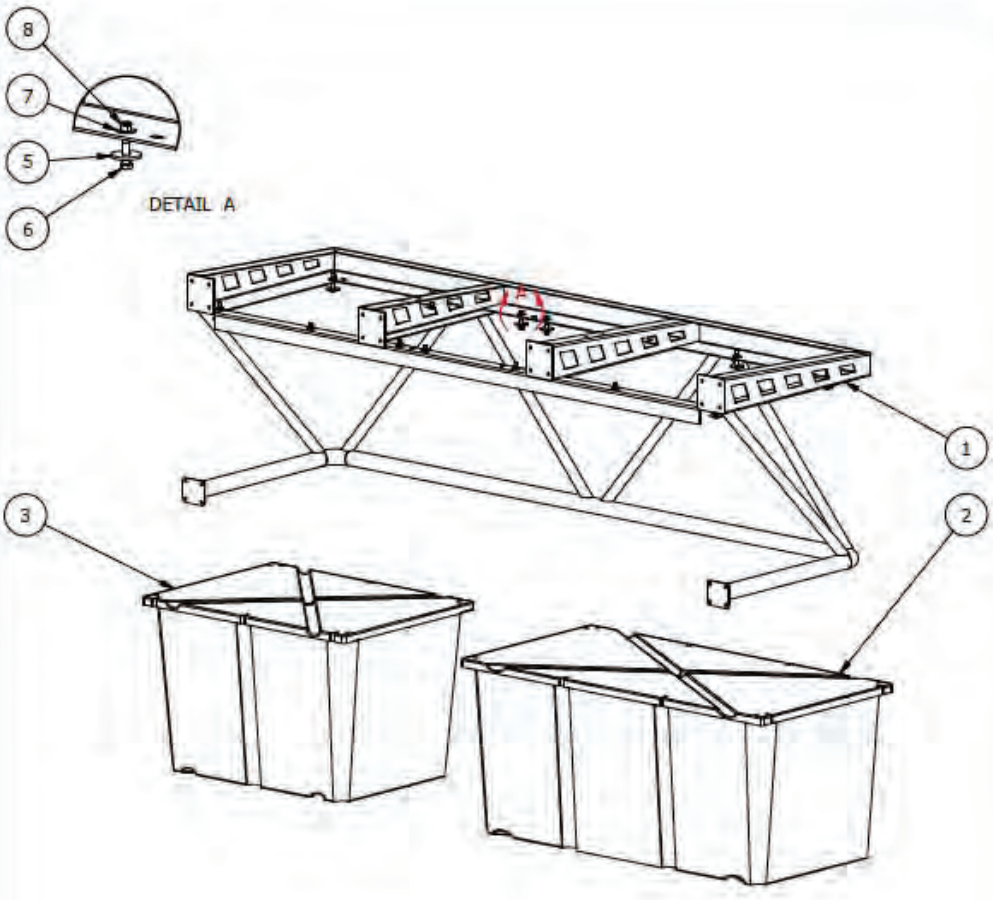
ITEM	QTY	PART NUMBER	TITLE
1	1	106-826	2018 Lagoon Crawler - Center Frame
2	2	106-497	Pontoon Float - 4' x 6' x 32"
3	20	100-845	Crawler - Float Washer
4	20	100-960	Bolt - Hex Head - 0.5" x 3" - GR5
5	20	100-898	Washer - Flat - 0.5"
6	20	100-904	Nut - Nylock - 0.5"

EX2041 at 2, NUHN15000007312 (see Item 2).

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NUHN 2018 Lagoon Crawler

Side-Float Sub-Assembly - Right 106-828

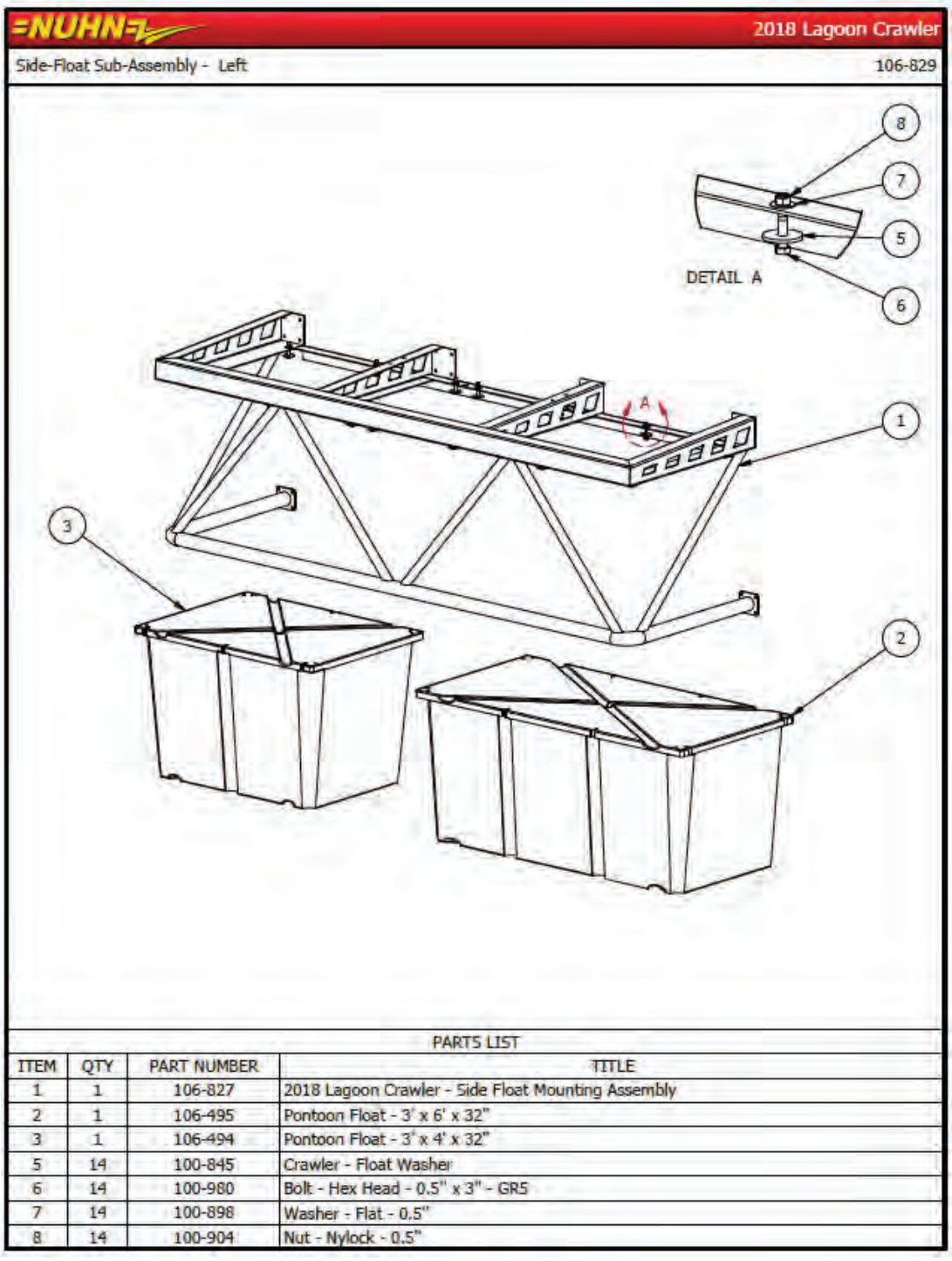


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-827	2018 Lagoon Crawler - Side Float Mounting Assembly
2	1	106-495	Pontoon Float - 3' x 6' x 32"
3	1	106-494	Pontoon Float - 3' x 4' x 32"
5	14	100-845	Crawler - Float Washer
6	14	100-980	Bolt - Hex Head - 0.5" x 3" - GR5
7	14	100-898	Washer - Flat - 0.5"
8	14	100-904	Nut - Nylock - 0.5"

EX2041 at 3, NUHN15000007313 (see Item 2).

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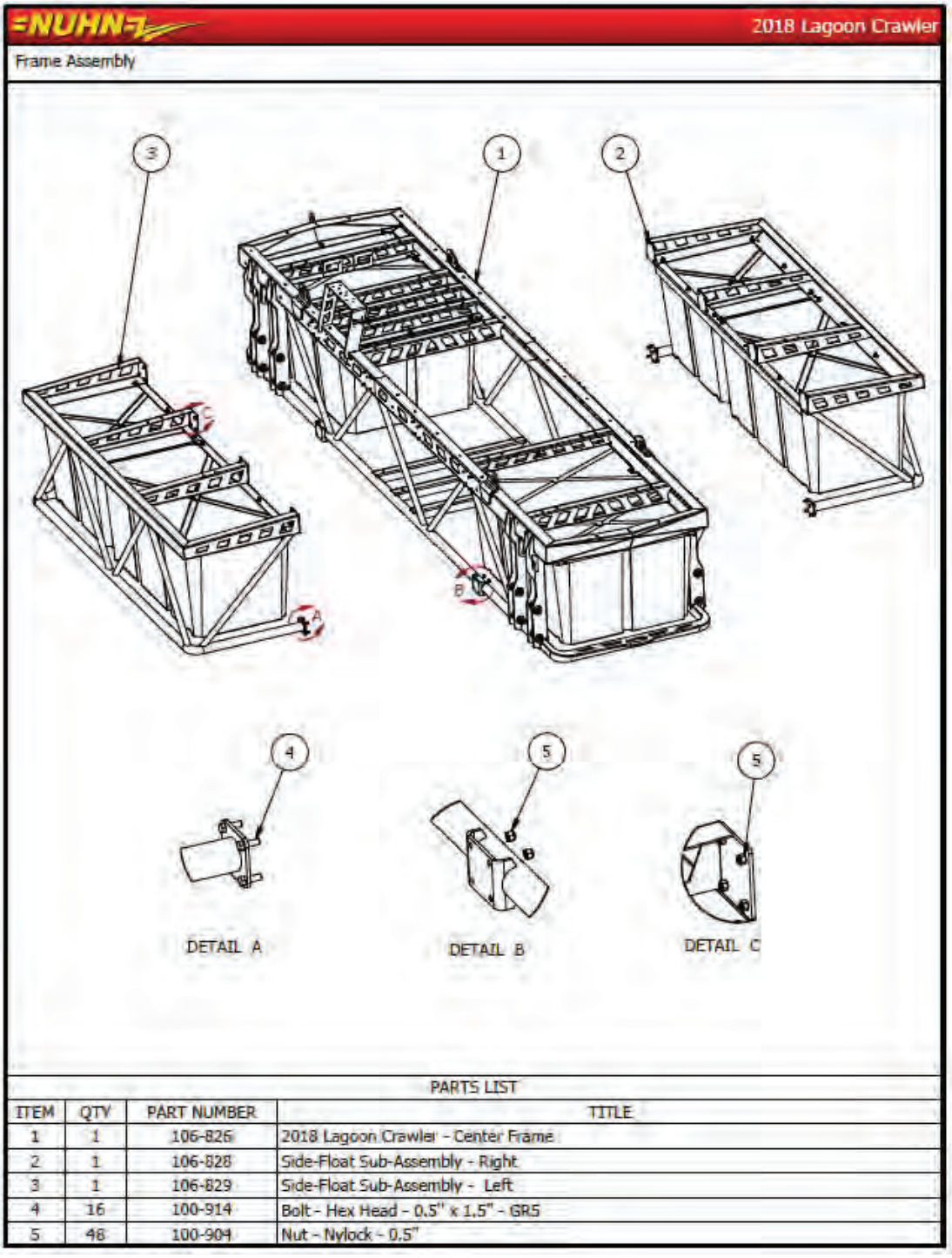


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-827	2018 Lagoon Crawler - Side Float Mounting Assembly
2	1	106-495	Pontoon Float - 3' x 6' x 32"
3	1	106-494	Pontoon Float - 3' x 4' x 32"
5	14	100-845	Crawler - Float Washer
6	14	100-980	Bolt - Hex Head - 0.5" x 3" - GR5
7	14	100-898	Washer - Flat - 0.5"
8	14	100-904	Nut - Nylock - 0.5"

EX2041 at 4, NUHN15000007314 (see Item 2).

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-826	2018 Lagoon Crawler - Center Frame
2	1	106-828	Side-Float Sub-Assembly - Right
3	1	106-829	Side-Float Sub-Assembly - Left
4	16	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
5	48	100-904	Nut - Nylock - 0.5"

EX2041 at 5, NUHN15000007315.

440. Thus it is my opinion that Nuhn's Gen 2 Lagoon Crawler has "a floatable vehicle body" as recited in Claim 1 of the '425 Patent.

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iii. "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor;"

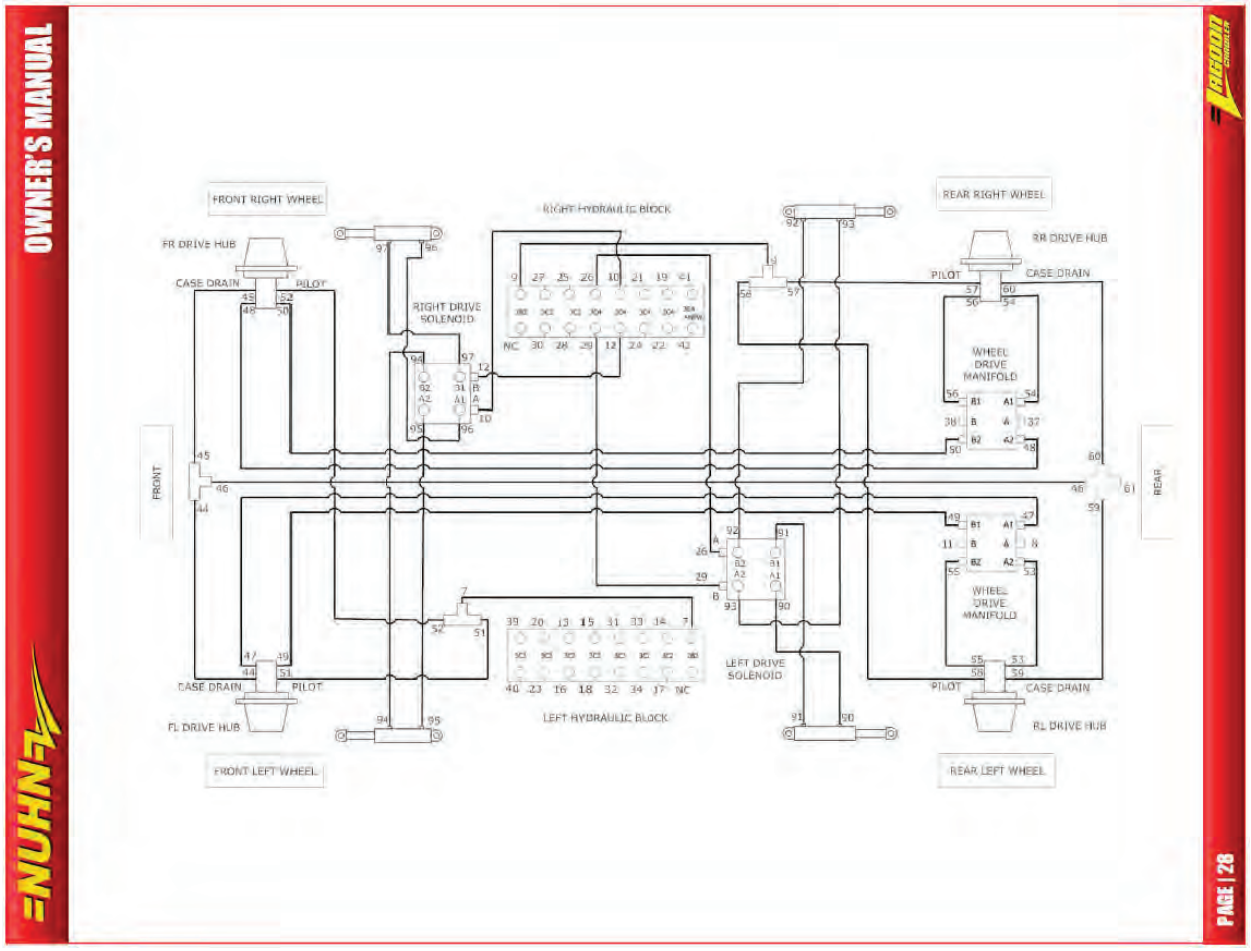
441. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler describes that it includes "750/50 R24 Radial Tires" and "Four-Wheel Drive" provided by "Two Speed Hydraulic Wheel Drives," with the hydraulic wheel drives having a "[h]igh torque mode for crawling out of lagoons" and a "high speed mode for transporting on land":

Drive System	Off-Road Independent A-Arm Suspension Four-Wheel Drive Four-Wheel Steering System 750/50 R24 Radial Tires Two Speed Hydraulic Wheel Drives High torque mode for crawling out of lagoons High speed mode for transporting on land

EX2040 at 6, NUHN15000046730.

442. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler further includes the schematics for the hydraulic system that powers the four hydraulic motors that power the four wheels, respectively:

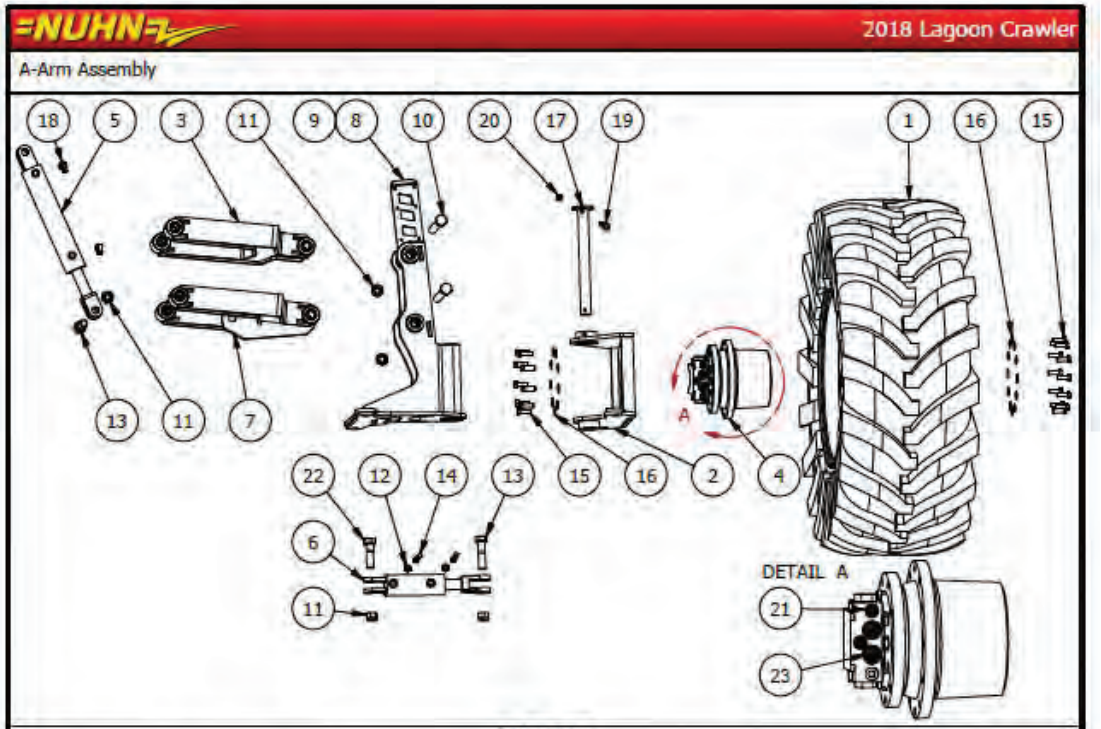
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EX2040 at 28, NUHN15000046752.

443. One of the four wheels and one of the hydraulic motors are shown in the parts catalogue for Nuhn's Gen 2 Lagoon Crawler:

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-779	Tire Assembly - 500/70 R24
2	1	100-715	Crawler - Wheel Drive Mounting Bracket
3	1	100-777-2	2018 Lagoon Crawler A-Arm
4	1	103-929	Crawler - Wheel Drive
5	1	105-170	2.5" x 12" Welded Cylinder - Parallel Ports
6	1	100-895	Hyd. Cylinder - Welded - 2.5" x 4"
7	1	100-778-2	2018 Lagoon Crawler A-Arm with Cylinder Lug
8	1	106-553	Crawler - Wheel Drive Upright Bracket - Rear
9	1	100-714-1	Crawler - Wheel Drive Upright Bracket - Front
10	2	104-161	Bolt - Hex Head - 1" x 10" - GR8
11	5	100-907	Nut - Nylock - 1"
12	2	104-455	Hyd. Adapter - Straight - #4 MORS x #8 MOR
13	2	100-467	Bolt - Hex Head - 1" x 4" - GR5
14	2	104-794	Hyd. Adaptor - 90° Elbow - #4 MORS x #4 FORSX
15	21	100-925	Bolt - Hex Head - M14 x 40 - 8.8
16	21	104-005	Washer - Flat - 0.5625" - GR8
17	1	100-884	Crawler - A-Arm Pin Assembly
18	2	104-804	Hyd. Adaptor - 90° Elbow - #6 MORS x #8 MOR
19	1	104-321	Bolt - Hex Head - 0.5" x 3.75" - GR5
20	1	100-904	Nut - Nylock - 0.5"
21	2	104-800	Hyd. Adaptor - Straight - #4 MBSPP x #4 MORS
22	1	100-920	Bolt - Hex Head - 1" x 3.5" - GR5
23	2	104-926	Hyd. Adaptor - Straight - #8 MBSPP x #8 MORS

EX2041 at 16, NUHN15000007326 (*see* Items 1, 4).

444. Thus it is my opinion that Nuhn's Gen 2 Lagoon Crawler has a "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic

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motor" as recited in Claim 1 of the '425 Patent.

iv. "a fluid pump for pumping liquid manure;"

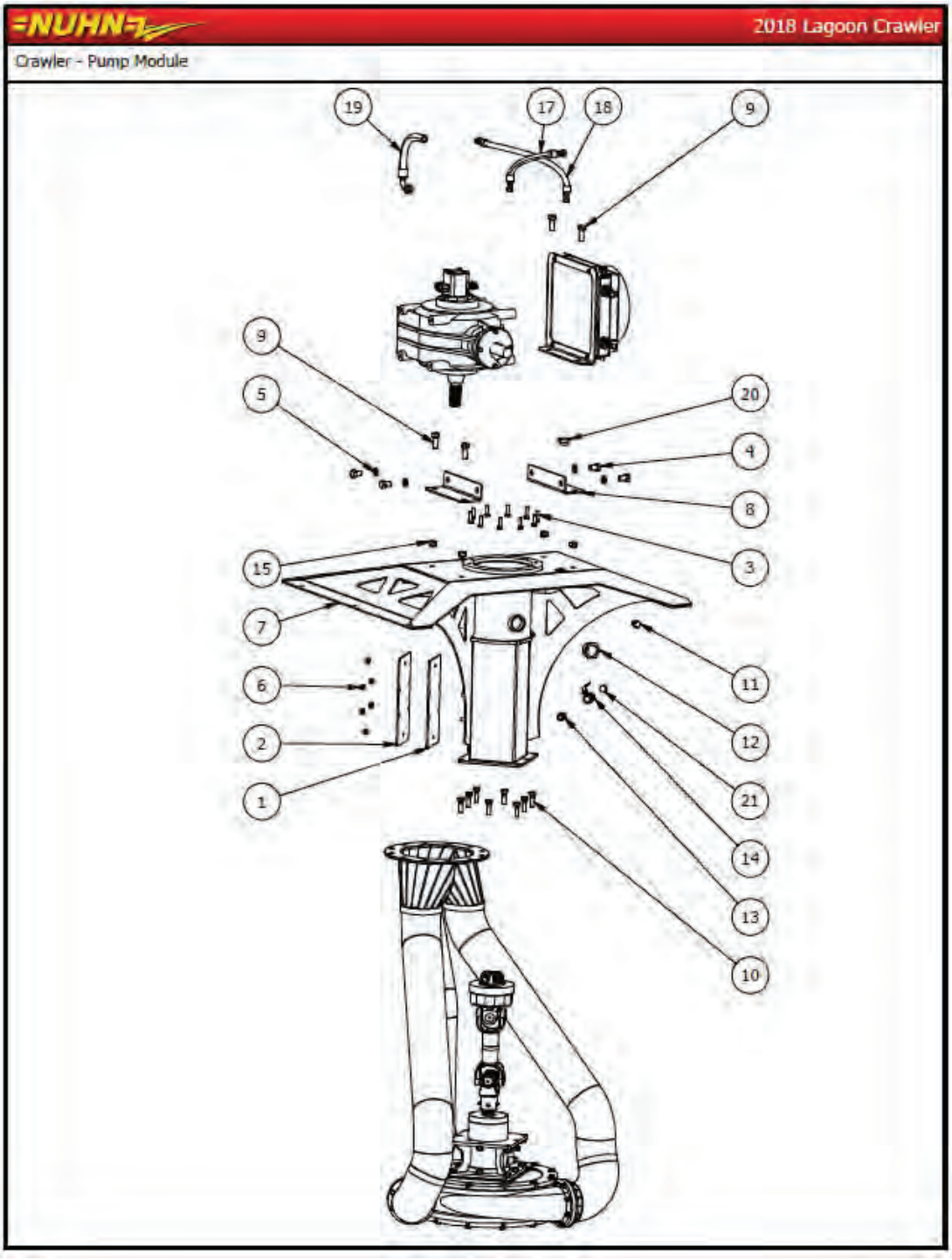
445. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler describes that it includes a centrifugal pump that is "[s]pecifically designed for harsh lagoon environment" and has a "[s]emi-open impellor design [that] allows large foreign material to pass through pump":

Centrifugal Pump	12" Tri Port Header Pump 12,000GPM capacity 14" pump inlet 12" pump discharge 21" diameter impeller 3 outlets off of pump housing Tungsten carbide mechanical seal *Designed to work in the harshest sand environments* *Oil bath assembly - requires very little operator maintenance* Specifically designed for harsh lagoon environment *Pump is submerged in lagoon so it will not lose its prime* *Semi-open impellor design allows large foreign material to pass through pump*

EX2040 at 6, NUHN15000046730.

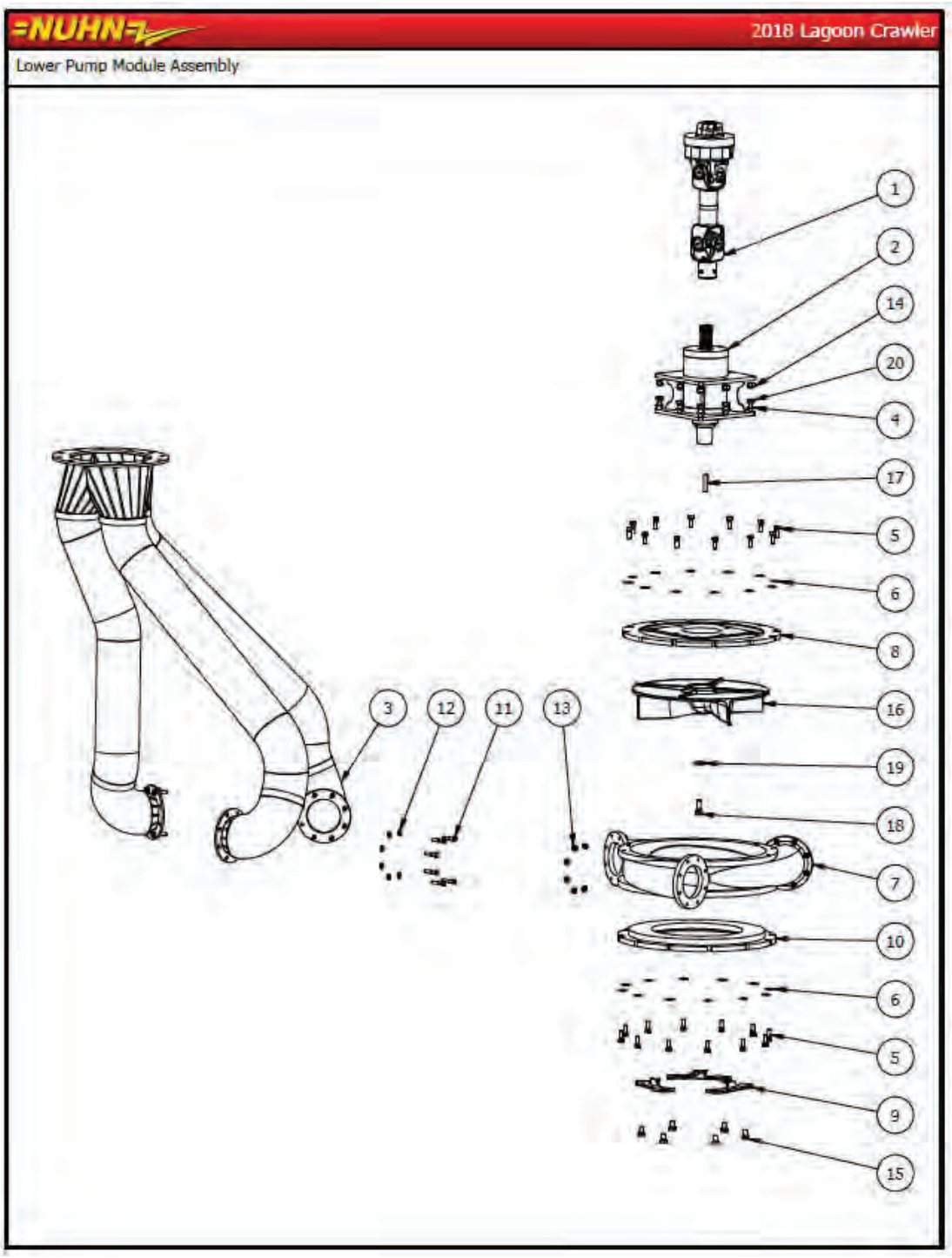
446. The parts catalog for the MY2018 Gen 2 Lagoon Crawler shows the various details of the pump module with the semi-open impeller design described above:

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EX2041 at 31, NUHN15000007341.

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EX2041 at 36, NUHN15000007346 (*see* Items 3, 7, 8, 10, 16).

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NUHN 2018 Lagoon Crawler

Lower Pump Module Assembly

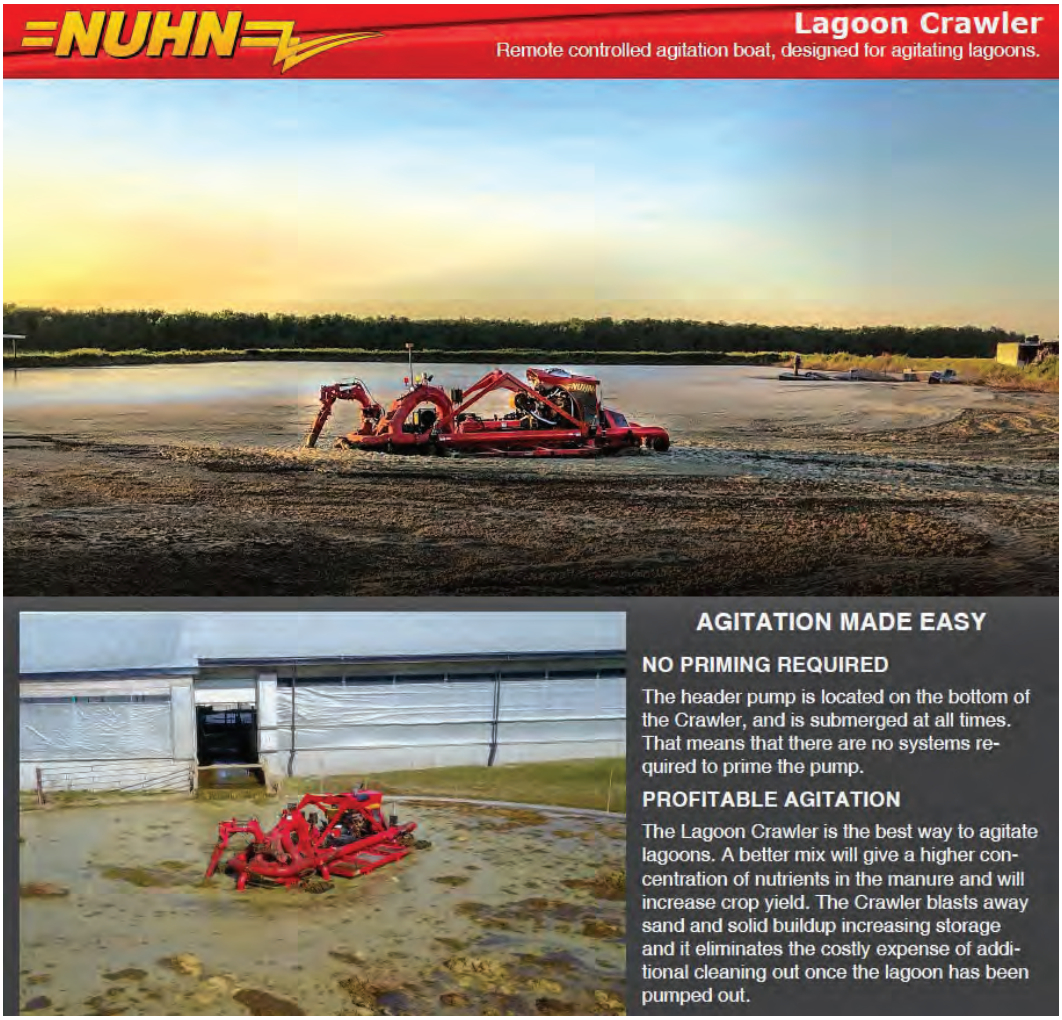
PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-951	Crawler - Vertical Shaft with Integrated Clutch - Weasler 55
2	1	100-820-3	Mech-TC Seal and Bearing System - 2.25" Complete
3	1	106-525	12" Header - Rev 2
4	8	101-187	Washer - Lock - 0.625"
5	24	104-911	Bolt - Hex Head - 0.5" x 1.375" - GR5
6	24	100-897	Washer - Flat - 0.4375"
7	1	105-228	8" Triple Port Pump - Housing 20.5" Finished - 550 HB -1A
8	1	105-229	8" Triple Port Pump - Top Housing Cover 550 HB -1A
9	3	106-762	Crawler - Inlet Chopper - 14" - 2018 Model
10	1	105-230	Inlet Cover with Inner BC - 14"
11	18	102-439	Bolt - Hex Head - 0.4375" x 2" - GR5
12	18	101-020	Washer - Flat - 0.3125"
13	18	100-903	Nut - Nylock - 0.4375"
14	8	PRT-0660	Nut - Nylock - 0.625"
15	6	101-057	Bolt - Hex Head - 0.625" x 1" - GR5
16	1	106-763	20.5" Impeller - Cast - 4 Blade
17	1	103-585 x 2.5"	Keyway - 0.625" X 0.625" X 2.5"
18	1	103-713	Bolt - Hex Head - 0.625" x 1.75" - GR5
19	1	105-657	Weld on Hex Washer 0.625"
20	8	PRT-0148	Bolt - Hex Head - 0.625" x 1.5" - GR5

EX2041 at 37, NUHN15000007347.

447. Another brochure for the Gen 2 Lagoon Crawler describes that the "header pump is located on the bottom of the Crawler, and is submerged at all times. That means that there are no systems required to prime the pump":

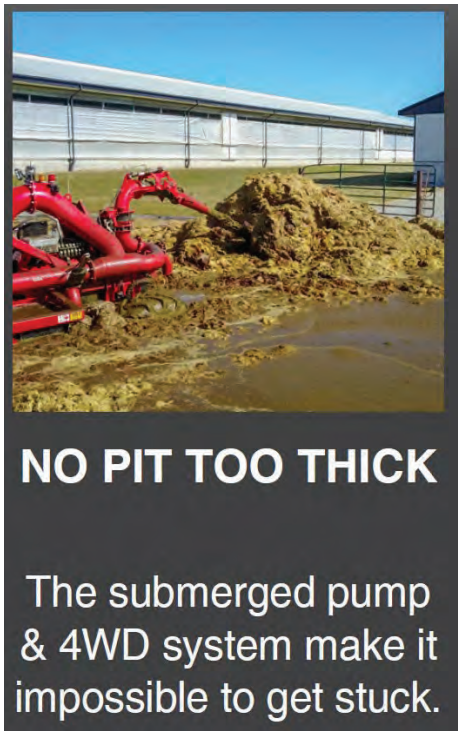
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EX2042 at 1, NUHN15000007245.

448. This same brochure states that there is "No Pit Too Thick" and that "The submerged pump & 4WD system make it impossible to get stuck":

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EX2042 at 2, NUHN15000007246.

449. Thus it is my opinion that Nuhn's Gen 2 Lagoon Crawler has "a fluid pump for pumping liquid manure" as recited in Claim 1 of the '425 Patent.

v. "a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump; and,"

450. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler describes that its power source is a CAT Diesel Tier 4 engine:

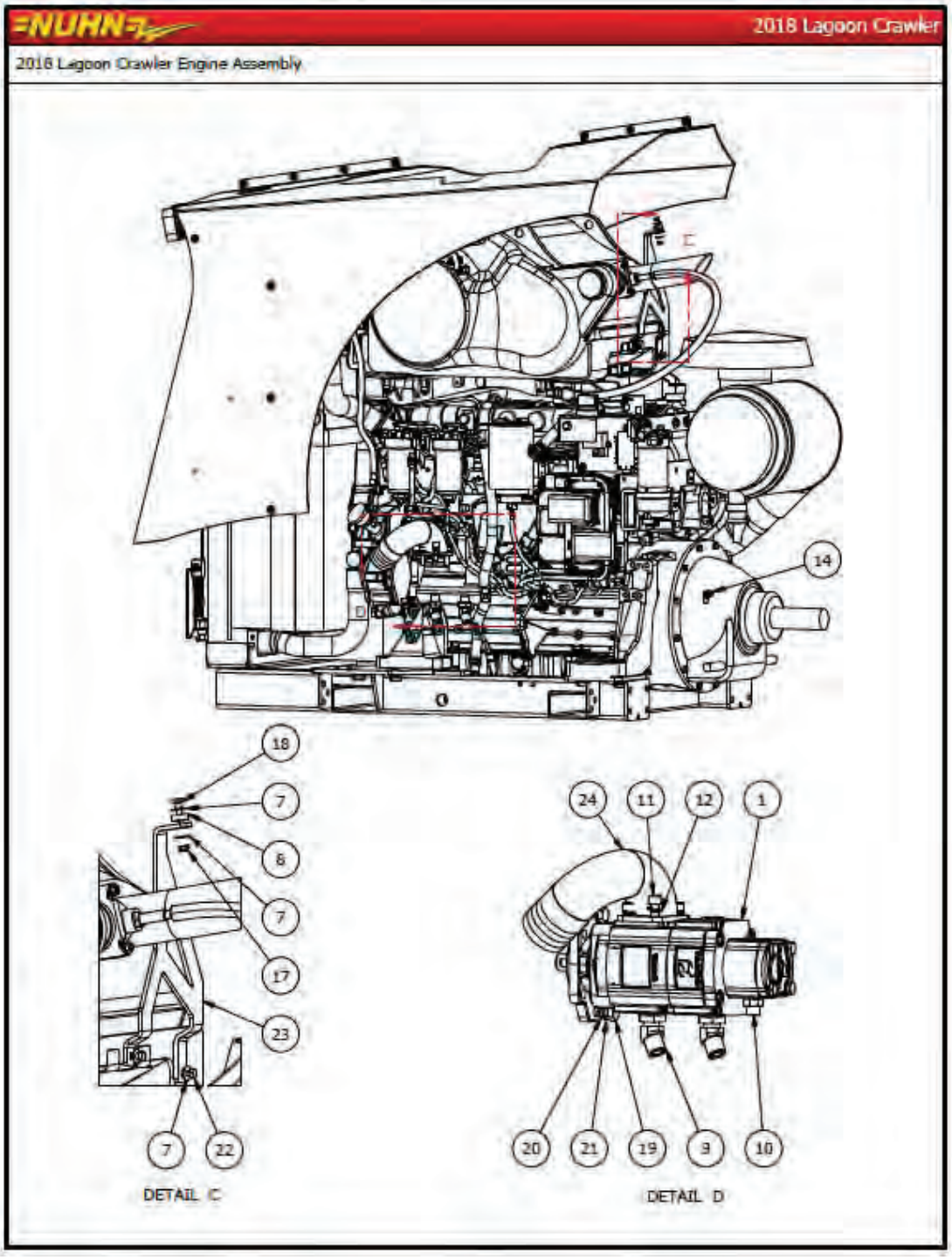
2.4 TECHINICAL SPECIFICATIONS

Engine	CAT Diesel Tier 4 Motor Max. Power: 302HP, 225kW Max. Torque: 935lb-ft @ 1400rpm, 1268Nm @ 1400rpm Emissions: U.S. EPA Tier 4 Final Nonroad

EX2040 at 6, NUHN15000046730.

451. The engine assembly is shown in the parts book for the MY2018 Gen 2 Lagoon Crawler:

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EX2041 at 21, NUHN15000007331.

452. The power source of Nuhn's Gen 2 Lagoon Crawler is connected to a hydraulic pump. Specifically, the hydraulic pump is a triple Casappa pump. It is my understanding that the

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hydraulic pump is directly driven by the engine. This arrangement is shown above, with the hydraulic pump (Item 1) shown specifically in Detail D. The hydraulic pump is referenced in the parts catalog of Nuhn's Gen 2 Lagoon Crawler:

NUHN 2018 Lagoon Crawler

2018 Lagoon Crawler Engine Assembly

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	105-656-1	Triple Casappa Pump
2	1	106-545	Engine Hood - 3 - Left
3	1	106-546	Engine Hood - 3 - Right
4	1	106-836	Engine Hood Stabilizer Tab Right - 2
5	1	106-835	Engine Hood Stabilizer Tab Left - 2
6	6	106-453	Rubber Hood Insulator - M8 x 1.25
7	45	101-020	Washer - Flat - 0.3125"
8	7	104-108	0.5" Rubber Washer 1" OD x 0.32"
9	2	104-449	Hyd. Adapter - 45° Elbow - #12 MORS x #12 MOR
10	1	104-809	Hyd. Adaptor - Straight - #10 MOR x #8 MORS
11	4	106-735	Bolt - Soc Head - 0.5" x 1.75" - 12.9 Black Oxide
12	4	100-900	Washer - Lock - 0.5"
13	9	104-103	Bolt - Hex Head - M8 x 20 - 8.8
14	1	105-676	Hyd. Adaptor - 90° Elbow - #6 MJ x #6 FJ
15	1	106-837	Rad Seal Top Plate
16	2	106-557	Work Light - Rectangular LED - 5400L
17	22	106-432	Nut - Nylock - M8
18	7	106-915	Bolt - Hex Head - M8 x 30 - 8.8
19	2	104-765	Bolt - Hex Head - M12 x 40 - 10.9
20	2	106-610	Washer - Lock - M12
21	2	106-611	Washer - Flat - M12
22	7	106-328	Bolt - Hex Head - M8 x 16
23	1	106-914	Crawler - Rear Hood Brace
24	1	106-825	3" Altered Hose Barb

EX2041 at 22, NUHN15000007332.

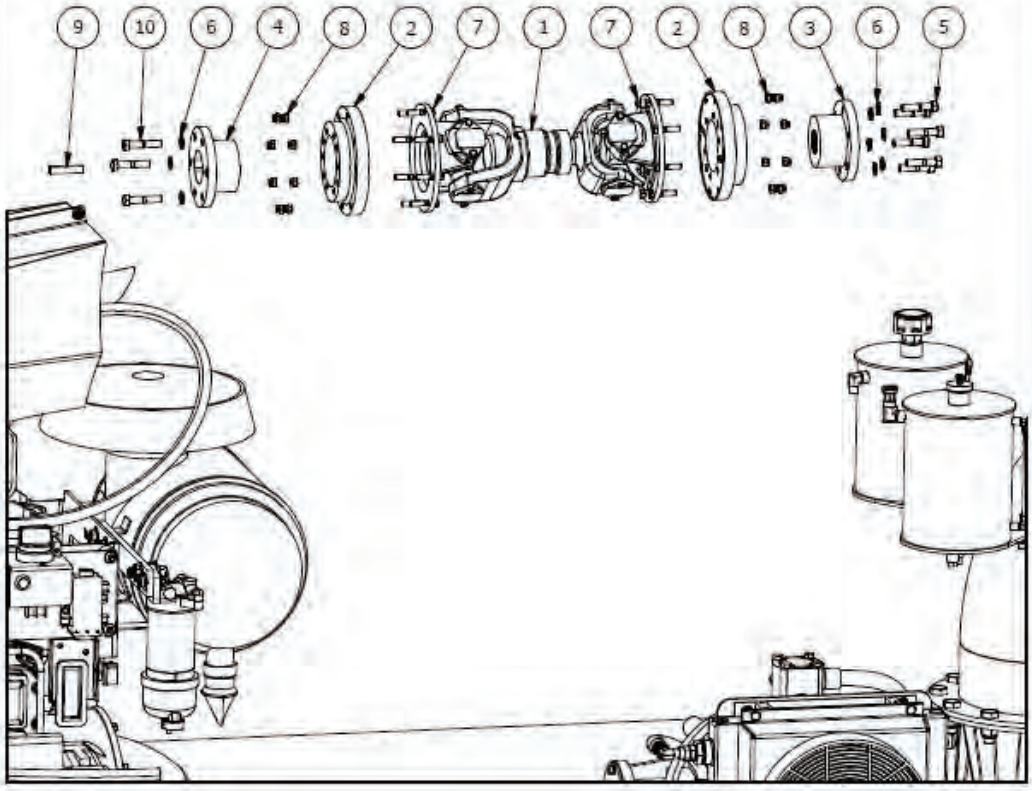
453. It is my understanding that this hydraulic pump is hydraulically connected to the four hydraulic wheel motors. That is, I understand that when the hydraulic pump is powered by the engine, it pressurizes hydraulic fluid, which can be used to power the four hydraulic wheel motors. Thus, the power source is configured to provide power to the ground engaging propulsion structure.

454. Additionally, the power source is also configured to provide power to the fluid pump of Nuhn's Gen 2 Lagoon Crawler. Specifically, the engine is connected to and powers the fluid pump by a horizontal drive shaft assembly, a gear box assembly, and a vertical driveshaft. Each of these are shown in the parts catalog for Nuhn's Gen 2 Lagoon Crawler:

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NUHN 2018 Lagoon Crawler

Drive Line Assembly

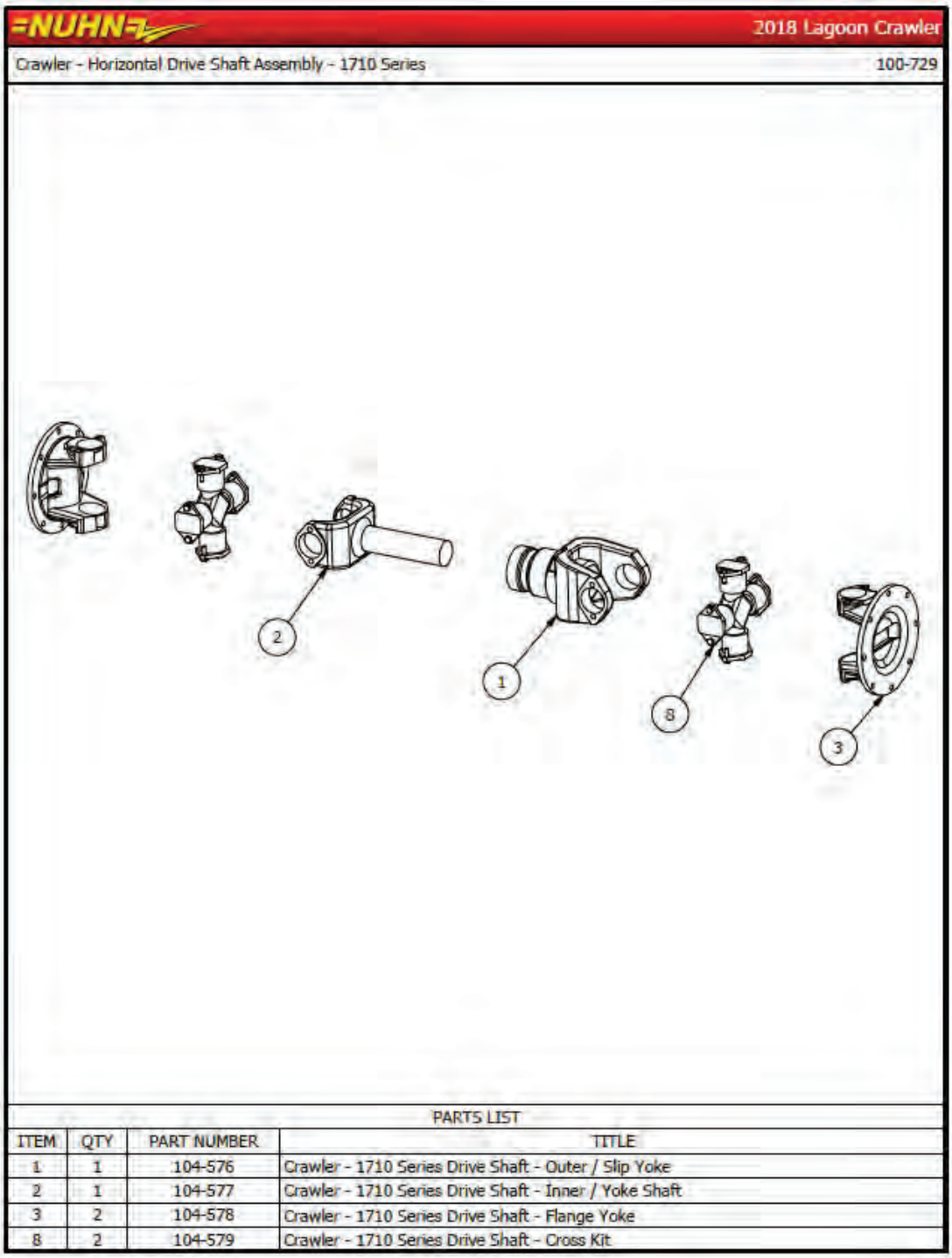


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-729	Crawler - Horizontal Drive Shaft Assembly - 1710 Series
2	2	104-682	Crawler - E Taper Lock Female to 1710
3	1	104-680	Crawler - Taper Lock Bushing - Spline (Gear Box)
4	1	104-681	Crawler - Taper Lock Bushing - Keyway (Engine)
5	6	104-319	Bolt - Hex Head - 0.5" x 2.25" - GR5
6	9	100-900	Washer - Lock - 0.5"
7	16	100-908	Bolt - Hex Head - 0.375" x 1.75" - GR5
8	16	100-902	Nut - Nylock - 0.375"
9	1	103-585 x 2.5"	Keyway - 0.625" X 0.625" X 2.5"
10	3	106-876	Bolt - Hex Head - 0.5" x 2.75" - GR8 - Black Oxide

EX2041 at 29, NUHN15000007339.

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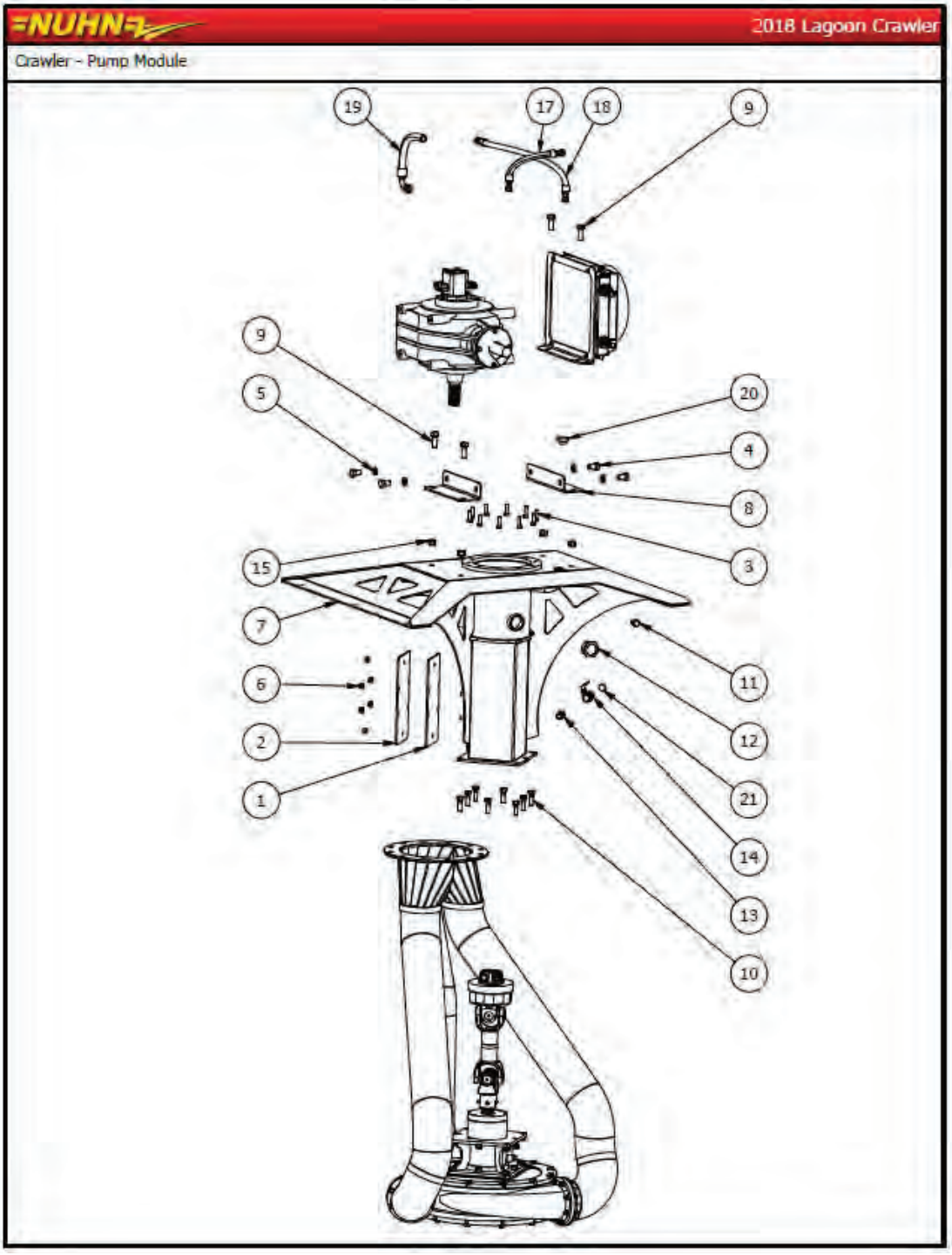


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	104-576	Crawler - 1710 Series Drive Shaft - Outer / Slip Yoke
2	1	104-577	Crawler - 1710 Series Drive Shaft - Inner / Yoke Shaft
3	2	104-578	Crawler - 1710 Series Drive Shaft - Flange Yoke
8	2	104-579	Crawler - 1710 Series Drive Shaft - Cross Kit

EX2041 at 30, NUHN15000007340.

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EX2041 at 31, NUHN15000007341.

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NUHN 2018 Lagoon Crawler

Crawler - Pump Module

PARTS LIST

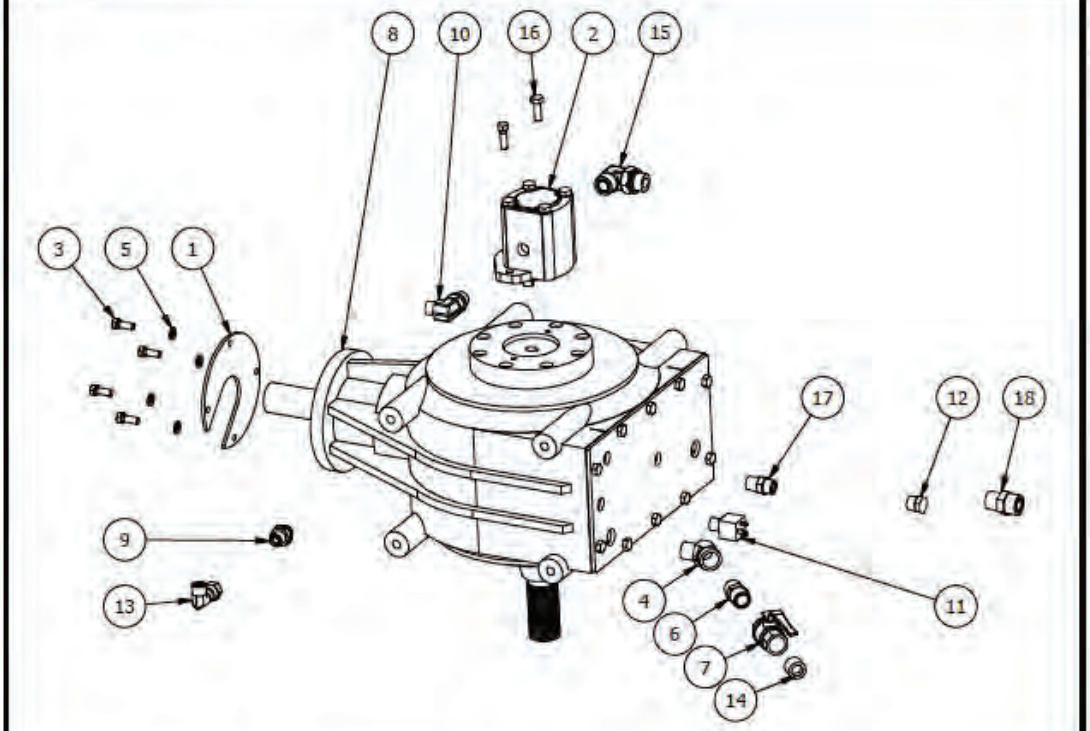
ITEM	QTY	PART NUMBER	TITLE
1	1	103-513	Gasket - Clean-Out Door - 15" x 7" x 0.25" - 6 Hole - No Cut Out
2	1	104-527	Clean-Out Door - 15" x 7" x 0.25" - 6 Hole
3	10	100-924	Bolt - Hex Head - M12 x 40 - 8.8
4	4	104-116	Bolt - Hex Head - M20 x 30 - 8.8
5	4	104-208	Washer - Lock - M20
6	6	100-904	Nut - Nylock - 0.5"
7	1	106-529	2018 Crawler Pump Frame - Rev 2
8	2	106-528	Gearbox Brace - Angle Iron
9	4	101-206	Bolt - Hex Head - 0.75" x 2" - GR5
10	6	101-059	Bolt - Hex Head - 0.625" x 2" - GR5
11	1	103-809	Plug - Hooded Breather - #6 NPT
12	1	101-449	Sight Glass - 2" Complete
13	1	101-536	Hyd. Adaptor Straight - #12 MP x #12 MP
14	1	102-166	Ball Valve - Brass - 0.75"
15	4	101-201	Nut - Nylock - 0.75"
17	1	106-778	Hydraulic Hose Assembly - 2018 Crawler - #99
18	1	106-777	Hydraulic Hose Assembly - 2018 Crawler - #98
19	1	106-779	Hydraulic Hose Assembly - 2018 Crawler - #2
20	1	103-489	Vacuum Pump - Flush Port Cap
21	1	106-924	Hyd. Fitting - Plug - #12 MP

EX2041 at 32, NUHN15000007342.

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NUHN 2018 Lagoon Crawler

Crawler - Gear Box Assembly

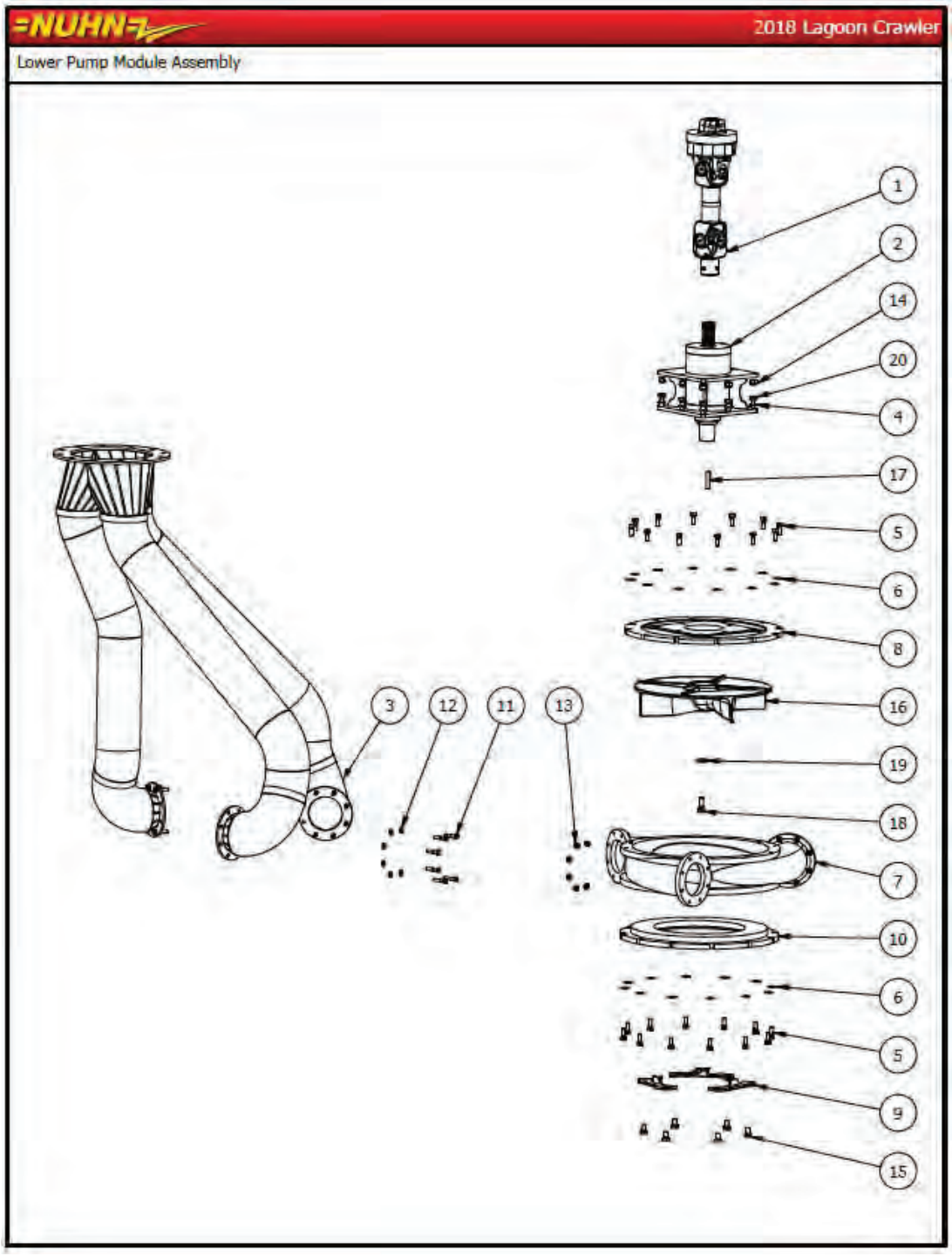


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	104-497	Gear Box Seal Guard
2	1	106-097	Crawler - Hydraulic - Pump PLP20.16D
3	4	101-021	Bolt - Hex Head - 0.375" x 1" - GR5
4	1	106-646	Hyd. Adaptor - 45° Elbow - #12 MP x #12 FP
5	4	101-185	Washer - Lock - 0.375"
6	1	101-536	Hyd. Adaptor Straight - #12 MP x #12 MP
7	1	102-166	Ball Valve - Brass - 0.75"
8	1	100-950-1	Crawler - Gear Box - T-332A
9	1	104-805	Hyd. Adapter - Straight - #8 MORS x #8 MOR
10	1	104-810	Hyd. Adaptor - 90° Elbow - #10 MOR x #8 MORS
11	1	106-092	Heat Sensor - 293F
12	1	101-805	Hex Head Plug - 0.5"
13	1	104-825	Hyd. Adapter - 90° Elbow - #8 MORS x #8 FORSX
14	1	106-924	Hyd. Fitting - Plug - #12 MP
15	1	104-814	Hyd. Adaptor - 90° Elbow - #12 MOR x #12 MORS
16	1	103-377	Bolt - Hex Head - M10 x 30 - 8.8
17	1	104-831	Hyd. Adaptor - Straight - #8 MORS x # 8 MP
18	1	104-707	Hyd. Adaptor - Straight - #12 MORS x #12 MP

EX2041 at 34, NUHN15000007344.

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EX2041 at 36, NUHN15000007346.

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NUHN 2018 Lagoon Crawler

Lower Pump Module Assembly

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-951	Crawler - Vertical Shaft with Integrated Clutch - Weasler 55
2	1	100-820-3	Mech-TC Seal and Bearing System - 2.25" Complete
3	1	106-525	12" Header - Rev 2
4	8	101-187	Washer - Lock - 0.625"
5	24	104-911	Bolt - Hex Head - 0.5" x 1.375" - GR5
6	24	100-897	Washer - Flat - 0.4375"
7	1	105-228	8" Triple Port Pump - Housing 20.5" Finished - 550 HB -1A
8	1	105-229	8" Triple Port Pump - Top Housing Cover 550 HB -1A
9	3	106-762	Crawler - Inlet Chopper - 14" - 2018 Model
10	1	105-230	Inlet Cover with Inner BC - 14"
11	18	102-439	Bolt - Hex Head - 0.4375" x 2" - GR5
12	18	101-020	Washer - Flat - 0.3125"
13	18	100-903	Nut - Nylock - 0.4375"
14	8	PRT-0660	Nut - Nylock - 0.625"
15	6	101-057	Bolt - Hex Head - 0.625" x 1" - GR5
16	1	106-763	20.5" Impeller - Cast - 4 Blade
17	1	103-585 x 2.5"	Keyway - 0.625" X 0.625" X 2.5"
18	1	103-713	Bolt - Hex Head - 0.625" x 1.75" - GR5
19	1	105-657	Weld on Hex Washer 0.625"
20	8	PRT-0148	Bolt - Hex Head - 0.625" x 1.5" - GR5

EX2041 at 37, NUHN15000007347.

455. Thus it is my opinion that Nuhn's Gen 2 Lagoon Crawler has "a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump" as recited in Claim 1 of the '425 Patent.

vi. "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 fluid 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."

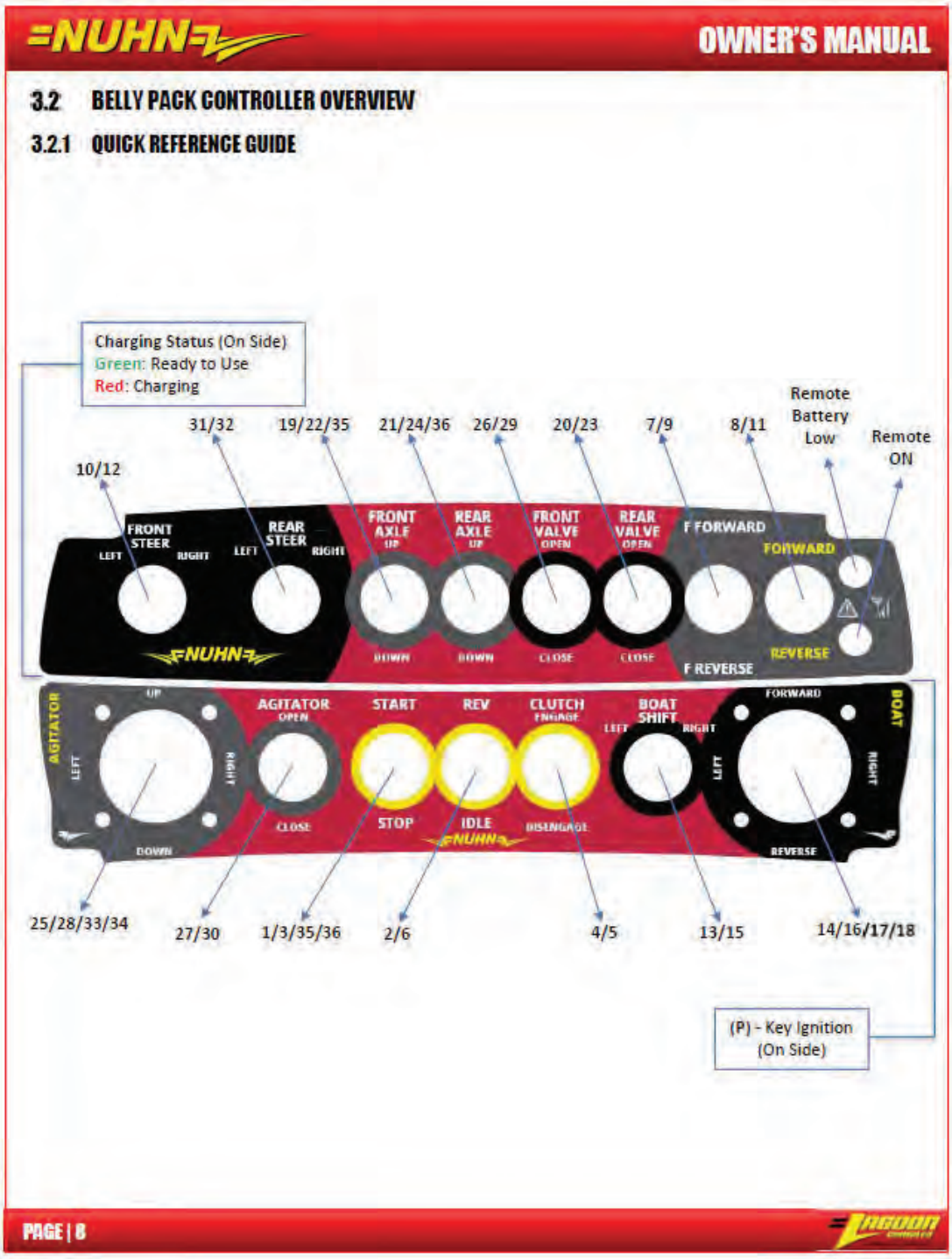
456. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler describes that all of the machine operations are controlled through wireless remote control. It describes that the wireless remote control is configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion structure; (2) control a flow of liquid manure from the fluid 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:

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User Interface	Complete Wireless Control All of the machine operation functions are controlled through the remote 50 hour battery life Functions: *Boat forward/reverse, as well as speed control* *Boat rotate left/right* *Boat shift left/right* *Drive forward/reverse* *Steer left/right* *Axle raise/lower* *Agitation gun movements* *Engine start/stop* *Engine throttle increase/decrease* *Clutch engage/disengage*

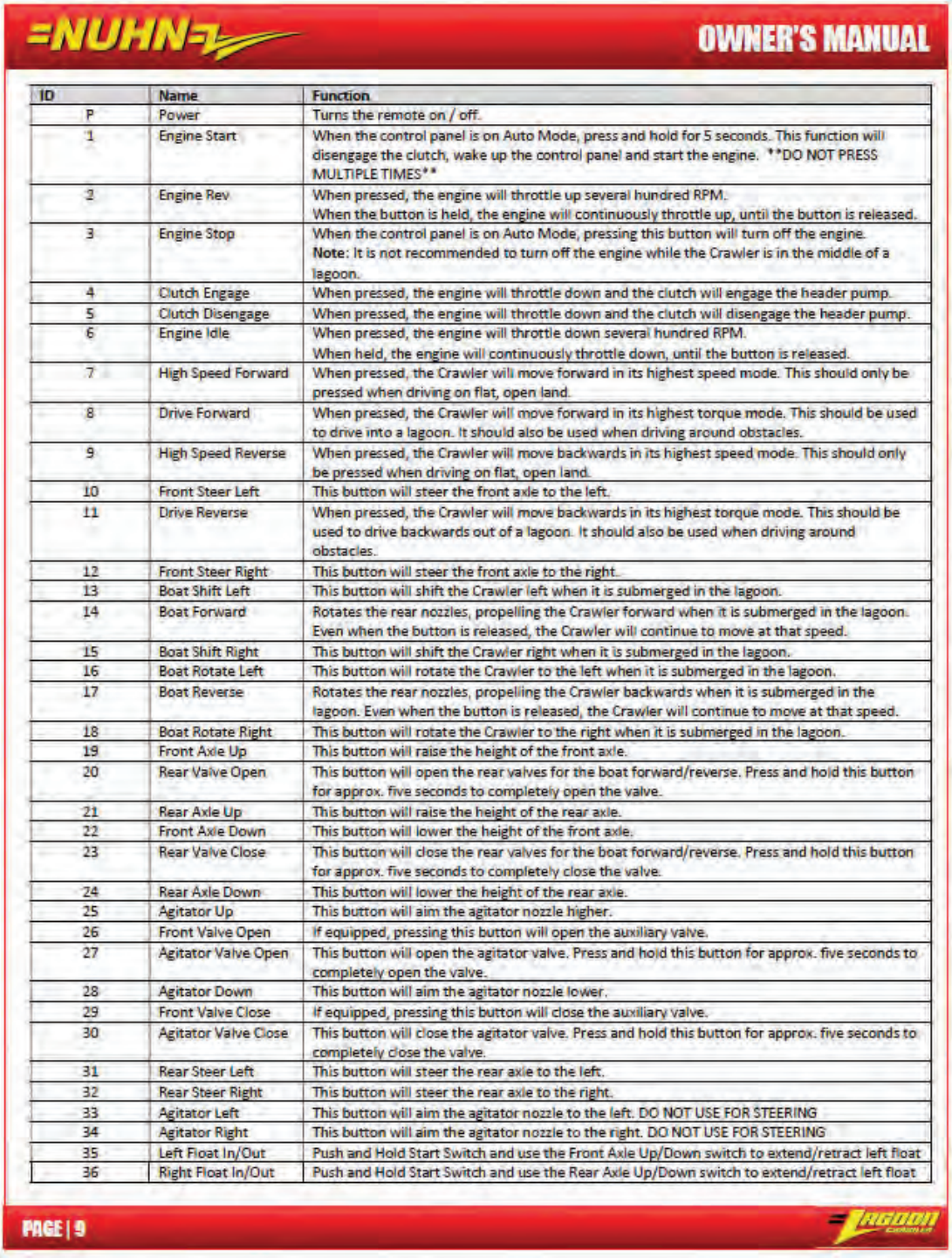
EX2040 at 6, NUHN15000046730.

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EX2040 at 8, NUHN15000046732.

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NUHN OWNER'S MANUAL

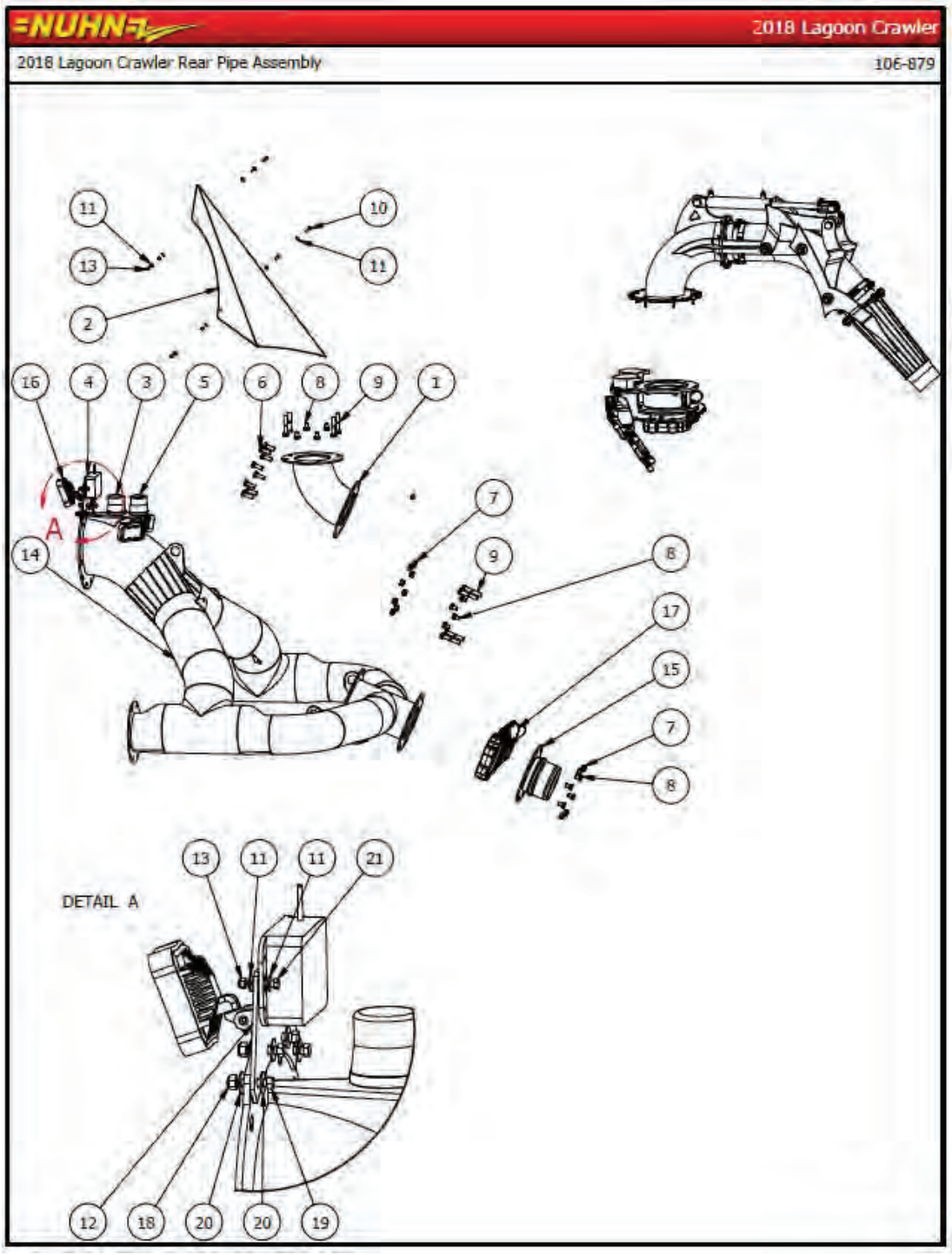
ID	Name	Function
P	Power	Turns the remote on / off.
1	Engine Start	When the control panel is on Auto Mode, press and hold for 5 seconds. This function will disengage the clutch, wake up the control panel and start the engine. **DO NOT PRESS MULTIPLE TIMES**
2	Engine Rev	When pressed, the engine will throttle up several hundred RPM. When the button is held, the engine will continuously throttle up, until the button is released.
3	Engine Stop	When the control panel is on Auto Mode, pressing this button will turn off the engine. **Note:** It is not recommended to turn off the engine while the Crawler is in the middle of a lagoon.
4	Clutch Engage	When pressed, the engine will throttle down and the clutch will engage the header pump.
5	Clutch Disengage	When pressed, the engine will throttle down and the clutch will disengage the header pump.
6	Engine Idle	When pressed, the engine will throttle down several hundred RPM. When held, the engine will continuously throttle down, until the button is released.
7	High Speed Forward	When pressed, the Crawler will move forward in its highest speed mode. This should only be pressed when driving on flat, open land.
8	Drive Forward	When pressed, the Crawler will move forward in its highest torque mode. This should be used to drive into a lagoon. It should also be used when driving around obstacles.
9	High Speed Reverse	When pressed, the Crawler will move backwards in its highest speed mode. This should only be pressed when driving on flat, open land.
10	Front Steer Left	This button will steer the front axle to the left.
11	Drive Reverse	When pressed, the Crawler will move backwards in its highest torque mode. This should be used to drive backwards out of a lagoon. It should also be used when driving around obstacles.
12	Front Steer Right	This button will steer the front axle to the right.
13	Boat Shift Left	This button will shift the Crawler left when it is submerged in the lagoon.
14	Boat Forward	Rotates the rear nozzles, propelling the Crawler forward when it is submerged in the lagoon. Even when the button is released, the Crawler will continue to move at that speed.
15	Boat Shift Right	This button will shift the Crawler right when it is submerged in the lagoon.
16	Boat Rotate Left	This button will rotate the Crawler to the left when it is submerged in the lagoon.
17	Boat Reverse	Rotates the rear nozzles, propelling the Crawler backwards when it is submerged in the lagoon. Even when the button is released, the Crawler will continue to move at that speed.
18	Boat Rotate Right	This button will rotate the Crawler to the right when it is submerged in the lagoon.
19	Front Axle Up	This button will raise the height of the front axle.
20	Rear Valve Open	This button will open the rear valves for the boat forward/reverse. Press and hold this button for approx. five seconds to completely open the valve.
21	Rear Axle Up	This button will raise the height of the rear axle.
22	Front Axle Down	This button will lower the height of the front axle.
23	Rear Valve Close	This button will close the rear valves for the boat forward/reverse. Press and hold this button for approx. five seconds to completely close the valve.
24	Rear Axle Down	This button will lower the height of the rear axle.
25	Agitator Up	This button will aim the agitator nozzle higher.
26	Front Valve Open	If equipped, pressing this button will open the auxiliary valve.
27	Agitator Valve Open	This button will open the agitator valve. Press and hold this button for approx. five seconds to completely open the valve.
28	Agitator Down	This button will aim the agitator nozzle lower.
29	Front Valve Close	If equipped, pressing this button will close the auxiliary valve.
30	Agitator Valve Close	This button will close the agitator valve. Press and hold this button for approx. five seconds to completely close the valve.
31	Rear Steer Left	This button will steer the rear axle to the left.
32	Rear Steer Right	This button will steer the rear axle to the right.
33	Agitator Left	This button will aim the agitator nozzle to the left. DO NOT USE FOR STEERING
34	Agitator Right	This button will aim the agitator nozzle to the right. DO NOT USE FOR STEERING
35	Left Float In/Out	Push and Hold Start Switch and use the Front Axle Up/Down switch to extend/retract left float
36	Right Float In/Out	Push and Hold Start Switch and use the Rear Axle Up/Down switch to extend/retract left float

PAGE | 9 LAGOON

EX2040 at 9, NUHN15000046733.

457. The remote control receiver is shown in the parts catalog for Nuhn's Gen 2 Lagoon Crawler (*see* Item 4):

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EX2041 at 48, NUHN15000007358.

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NUHN 2018 Lagoon Crawler

2018 Lagoon Crawler Rear Pipe Assembly 106-879

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-766	8" ANSI to 8" ANSI 67.5° Elbow 2018 Model
2	1	106-531	Splash Guard
3	1	105-865	Amber Warning Light
4	1	100-946	Remote - Crawler - Receiver
5	1	105-864	Red Warning Light
6	8	101-206	Bolt - Hex Head - 0.75" x 2" - GR5
7	16	101-201	Nut - Nylock - 0.75"
8	16	101-204	Bolt - Hex Head - 0.75" x 1" GR5
9	8	101-210	Bolt - Hex Head - 0.75" x 4" GR5
10	8	101-026	Bolt - Hex Head - 0.3125" x 1" - GR5
11	16	101-020	Washer - Flat - 0.3125"
12	1	106-534	Crawler - Antenna Mount
13	10	101-189	Nut - Nylock - 0.3125"
14	1	106-532	12" to 8" Y Pipe Assembly
15	1	100-517-1	8" ANSI to 8" Male Ringlock
16	3	106-557	Work Light - Rectangular LED - 5400L
17	2	105-693	Metaltecnica Cast Valve - 8" ANSI - with Cylinder - with Discharge
18	20	100-903	Nut - Nylock - 0.4375"
19	20	100-910	Bolt - Hex Head - 0.4375" x 1.5" - GR5
20	8	100-897	Washer - Flat - 0.4375"
21	2	103-771	Bolt - Hex Head - 0.3125" x 1.25" - GR5

EX2041 at 49, NUHN15000007359.

458. Thus it is my opinion that Nuhn's Gen 2 Lagoon Crawler has "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 fluid 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" as recited in Claim 1 of the '425 Patent.

459. Therefore, in view of the above, it is my opinion that the claims of the '425 Patent cover Nuhn's Gen 2 Lagoon Crawler and that Nuhn's Gen 2 Lagoon Crawler is commensurate with the scope of the claims of the '425 Patent.

3. NUHN'S GEN 3 LAGOON CRAWLER (MY2020-MY2022)

460. It is my opinion that the claims of the '425 Patent cover Nuhn's Gen 3 Lagoon Crawler and that Nuhn's Gen 3 Lagoon Crawler is commensurate with the scope of the claims of the '425 Patent.

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i. "An amphibious vehicle"

461. The Gen 3 Lagoon Crawler is an amphibious vehicle.

462. For example, the brochure for the MY2022 of the Gen 3 Lagoon Crawler shows it floating in liquid manure and describes that its wheels allow it to enter and exit the lagoon:

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EX2043 at 2, NUHN15000007242.

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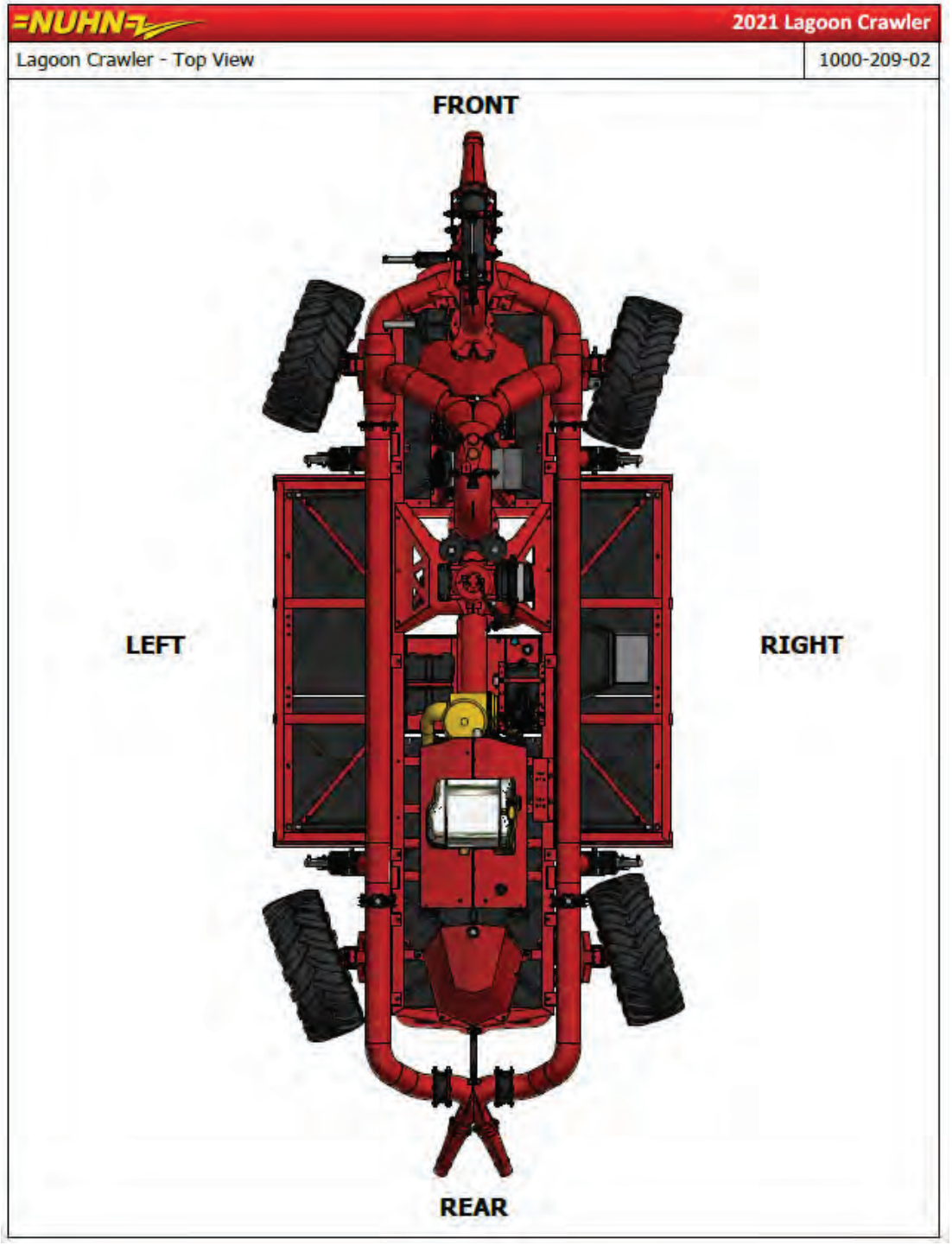


EX2043 at 1, NUHN15000007241.

463. Additionally, the Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes driving on land [EX2044 at 26, NUHN15000046785], driving into and exiting the manure lagoon [*id*. at 27, NUHN15000046786], agitating the lagoon [*id*. at 28, NUHN15000046787], and controlling the speed and direction of the Lagoon Crawler in the manure lagoon [*id*. at 29, NUHN15000046788].

464. The parts catalog for the MY2021 of the Gen 3 Lagoon Crawler shows that it is a vehicle with four wheels:

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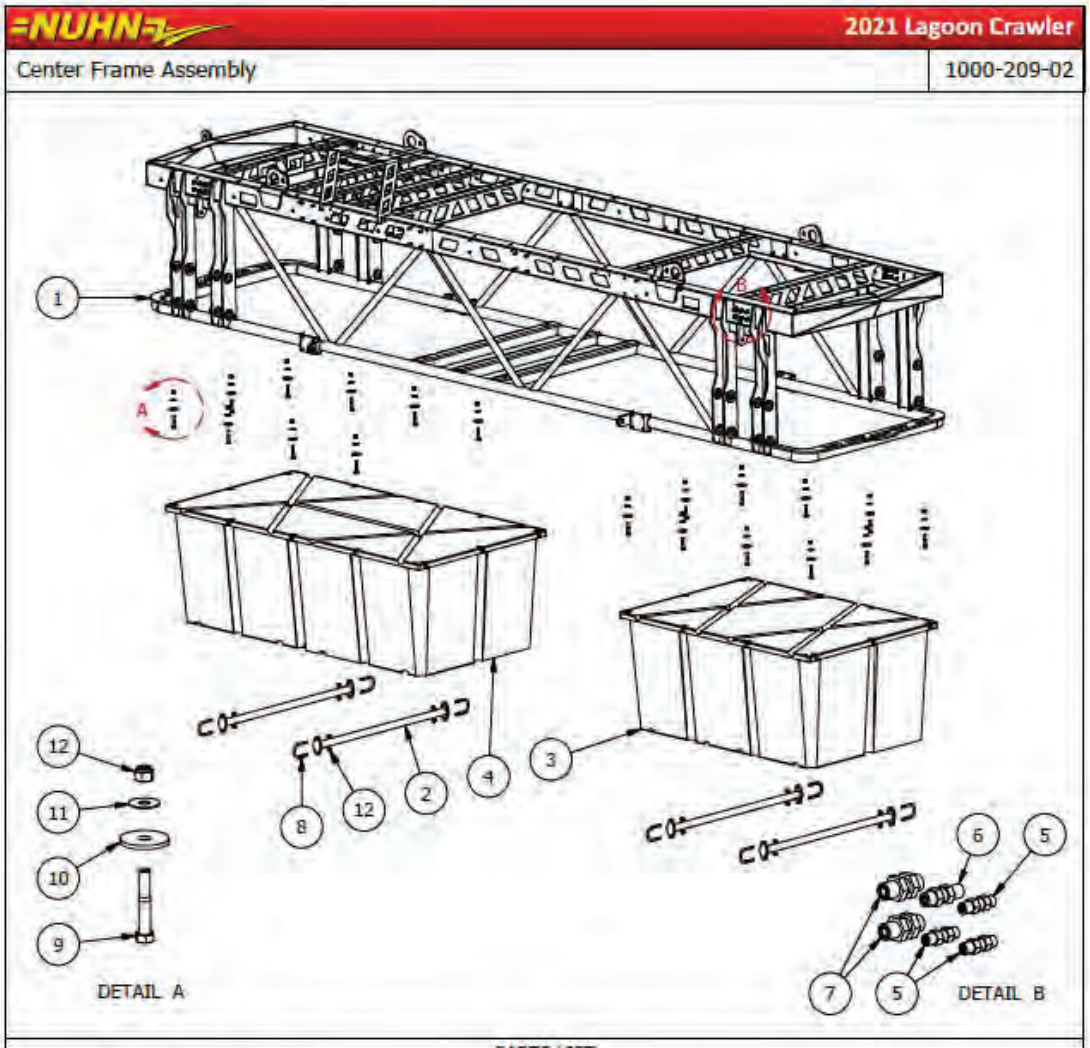
EX2045 at 3, NUHN15000007424.

465. Thus it is my opinion that Nuhn's Gen 3 Lagoon Crawler is an "amphibious vehicle" as recited in Claim 1 of the '425 Patent.

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ii. "a floatable vehicle body;"

466. The parts catalog for the Gen 3 Lagoon Crawler illustrates and describes the floats that are included with the Lagoon Crawler:

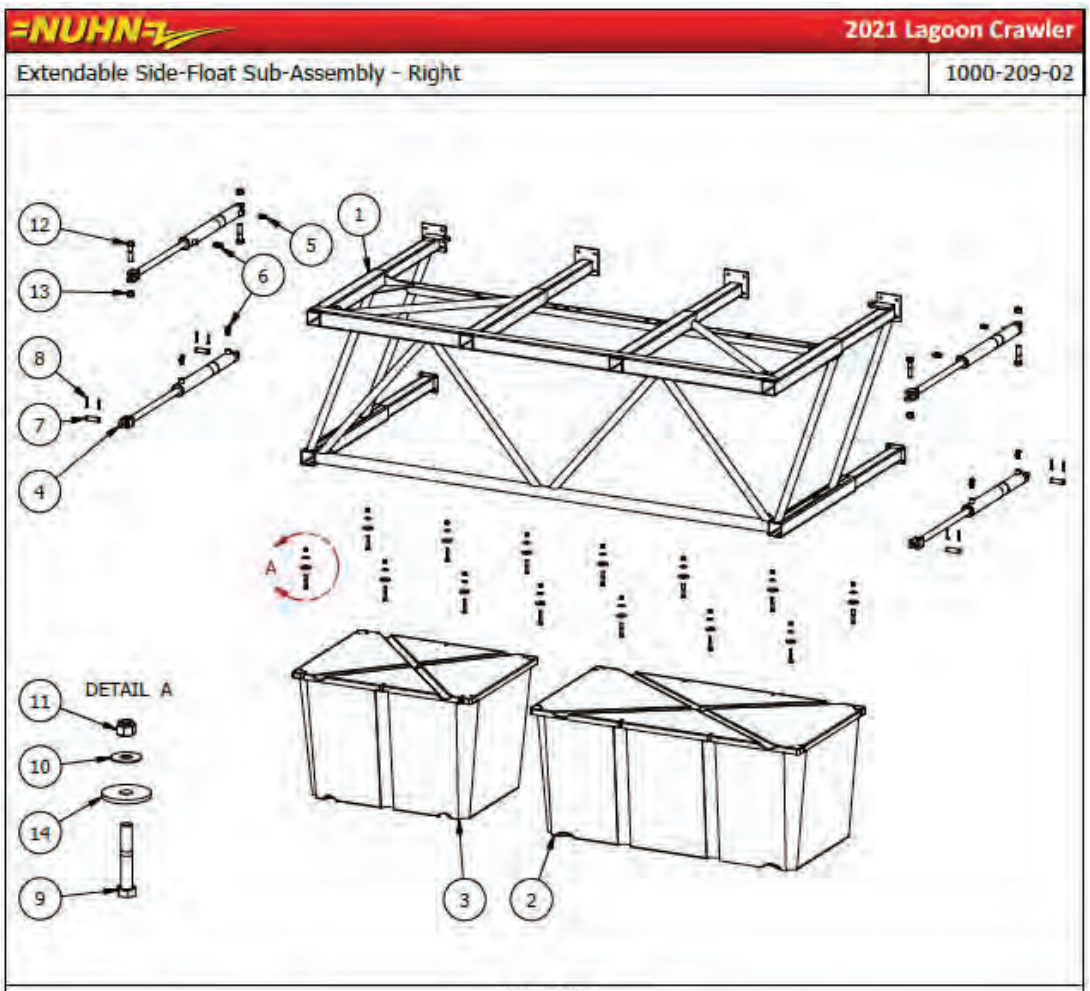


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	110-503	Lagoon Crawler - Center Frame - 2021 Model
2	4	110-504	Center Frame - Support Cross Bar
3	1	106-497	Pontoon Float - 48" x 72" x 32"
4	1	107-015	Pontoon Float - 48" x 96" x 32"
5	12	104-847	Hyd. Adaptor - Bulk Head - #4 MORS x #4 MORS (FS2700LN-0404)
6	4	104-848	Hyd. Adaptor - Bulk Head - #6 MORS x #6 MORS (FS2700LN-0606)
7	8	104-849	Hyd. Adaptor - Bulk Head - #8 MORS x #8 MORS (FS2700LN-0808)
8	8	104-137	Bolt - U - 0.5" x 2.5" Pipe size
9	19	100-980	Bolt - Hex Head - 0.5" x 3" - GR5
10	19	100-898	Washer - Flat - 0.5"
11	19	100-845	Float Washer - 2.25" OD x 0.625" ID x 0.1875"
12	35	100-904	Nut - Nylock - 0.5" - GR2

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EX2045 at 5, NUHN15000007426 (*see* Items 3, 4).



PARTS LIST

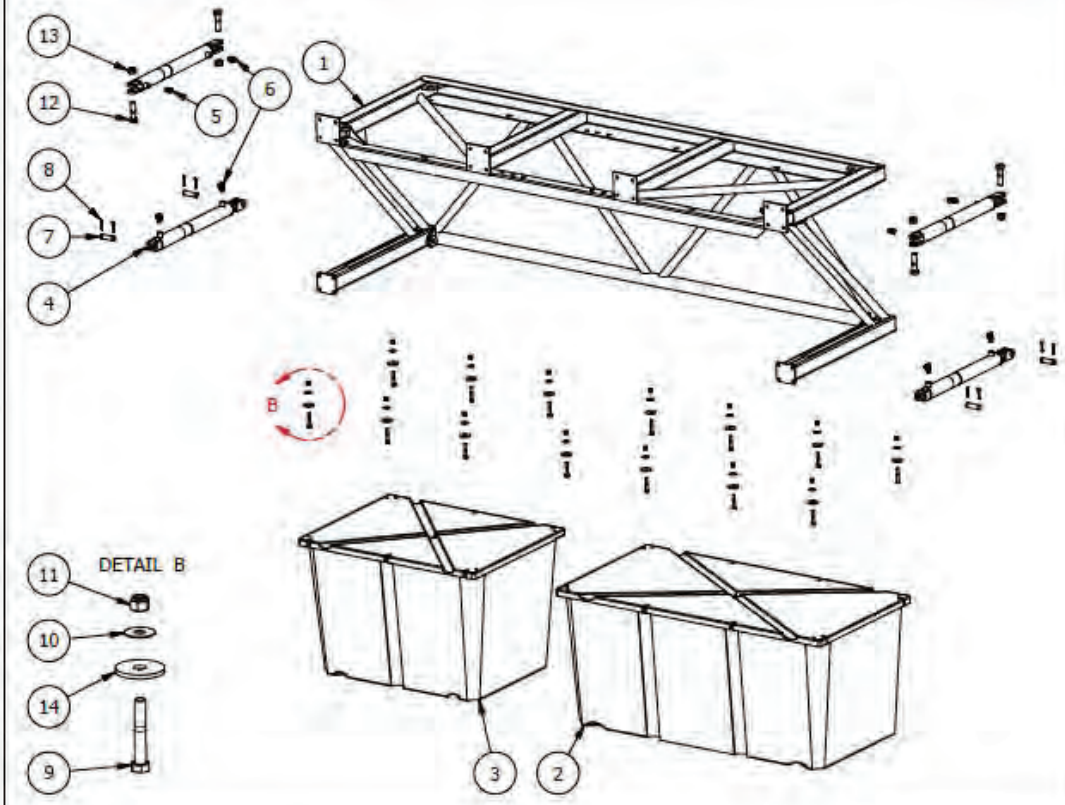
ITEM	QTY	PART NUMBER	TITLE
1	1	109-234	Extendable Side Float Frame - Right
2	1	106-495	Pontoon Float - 36" x 72" x 32"
3	1	106-494	Pontoon Float - 36" x 48" x 32"
4	4	107-327	Hyd. Cylinder - Welded - 2.5" x 24" - 90° Ports
5	2	104-803	Hyd. Adaptor - Straight - #6 MORS x #8 MOR (FS6400-06-08)
6	6	104-804	Hyd. Adaptor - 90° Elbow - #6 MORS x #8 MOR (FS6801-06-08)
7	4	107-682	Pin - Cylinder - 1" x 3.5"
8	8	107-432	Pin - Cotter - Extended Prong Square Cut Type - 0.125" x 2"
9	14	100-980	Bolt - Hex Head - 0.5" x 3" - GR5
10	14	100-898	Washer - Flat - 0.5"
11	14	100-904	Nut - Nylock - 0.5" - GR2
12	4	100-467	Bolt - Hex Head - 1" x 4" - GR5
13	4	100-907	Nut - Nylock - 1" - GR2
14	14	100-845	Float Washer - 2.25" OD x 0.625" ID x 0.1875"

EX2045 at 6, NUHN15000007427 (*see* Items 2, 3).

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NUHN 2021 Lagoon Crawler

Extendable Side-Float Sub-Assembly - Left | 1000-209-02

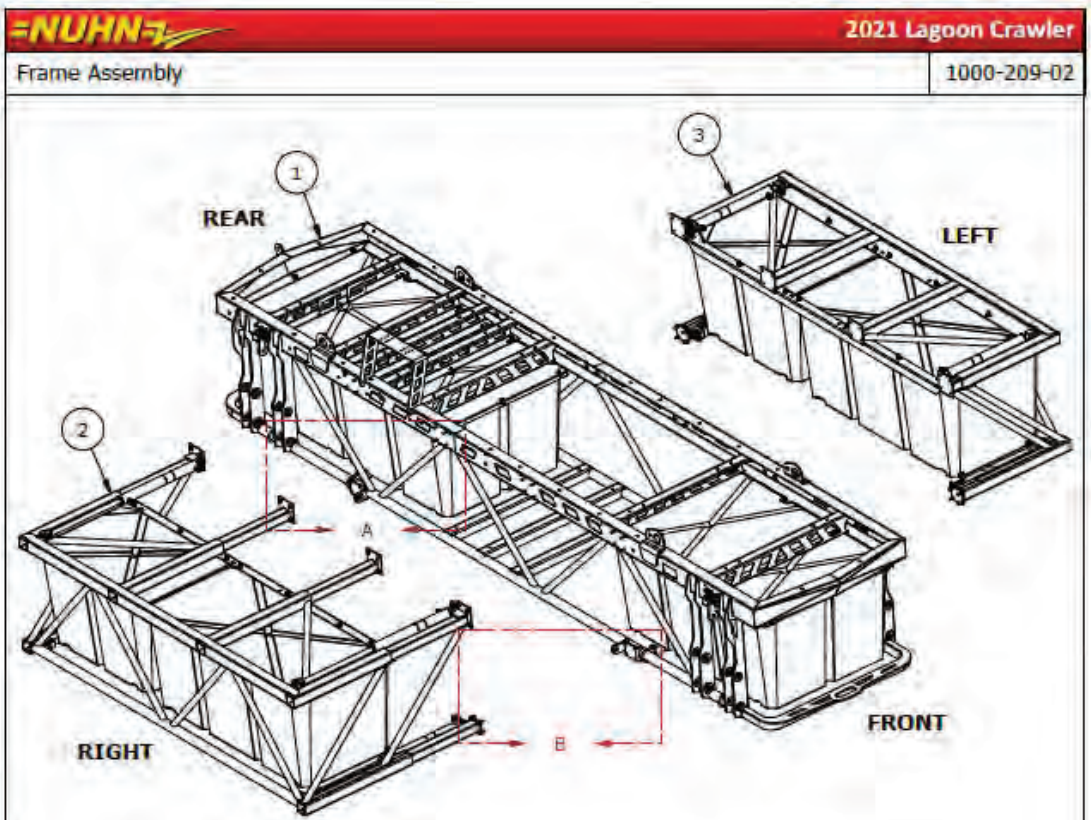


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	109-233	Extendable Side Float Frame - Left
2	1	106-495	Pontoon Float - 36" x 72" x 32"
3	1	106-494	Pontoon Float - 36" x 48" x 32"
4	4	107-327	Hyd. Cylinder - Welded - 2.5" x 24" - 90° Ports
5	2	104-803	Hyd. Adaptor - Straight - #6 MORS x #8 MOR (FS6400-06-08)
6	6	104-804	Hyd. Adaptor - 90° Elbow - #6 MORS x #8 MOR (FS6801-06-08)
7	4	107-682	Pin - Cylinder - 1" x 3.5"
8	8	107-432	Pin - Cotter - Extended Prong Square Cut Type - 0.125" x 2"
9	14	100-980	Bolt - Hex Head - 0.5" x 3" - GR5
10	14	100-898	Washer - Flat - 0.5"
11	14	100-904	Nut - Nylock - 0.5" - GR2
12	4	100-467	Bolt - Hex Head - 1" x 4" - GR5
13	4	100-907	Nut - Nylock - 1" - GR2
14	14	100-845	Float Washer - 2.25" OD x 0.625" ID x 0.1875"

EX2045 at 7, NUHN15000007428 (*see* Items 2, 3).

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	110-503	Lagoon Crawler - Center Frame - 2021 Model
2	1	109-234	Extendable Side-Float Frame - Right
3	1	109-233	Extendable Side-Float Frame - Left
4	32	104-962	Bolt - Round Head Carriage - 0.5" x 1.5" - GR5 (Welded to Frame)
5	16	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
6	48	100-904	Nut - Nylock - 0.5" - GR2

EX2045 at 4, NUHN15000007425.

467. Thus it is my opinion that Nuhn's Gen 3 Lagoon Crawler has "a floatable vehicle body" as recited in Claim 1 of the '425 Patent.

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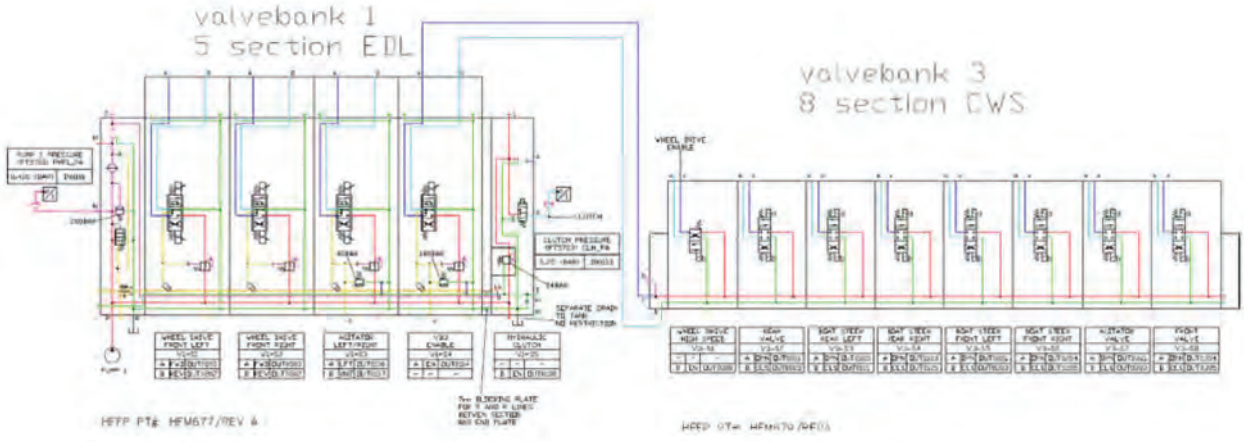
iii. "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor;"

468. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes that it includes "750/50 R24 Radial Tires" and "Four-Wheel Drive" provided by "Two Speed Hydraulic Wheel Drives," with the hydraulic wheel drives having a "[h]igh torque mode for crawling out of lagoons" and a "high speed mode for transporting on land":

Drive System	Off-Road Independent A-Arm Suspension Four-Wheel Drive Four-Wheel Steering System 750/50 R24 Radial Tires Two Speed Hydraulic Wheel Drives High torque mode for crawling out of lagoons High speed mode for transporting on land

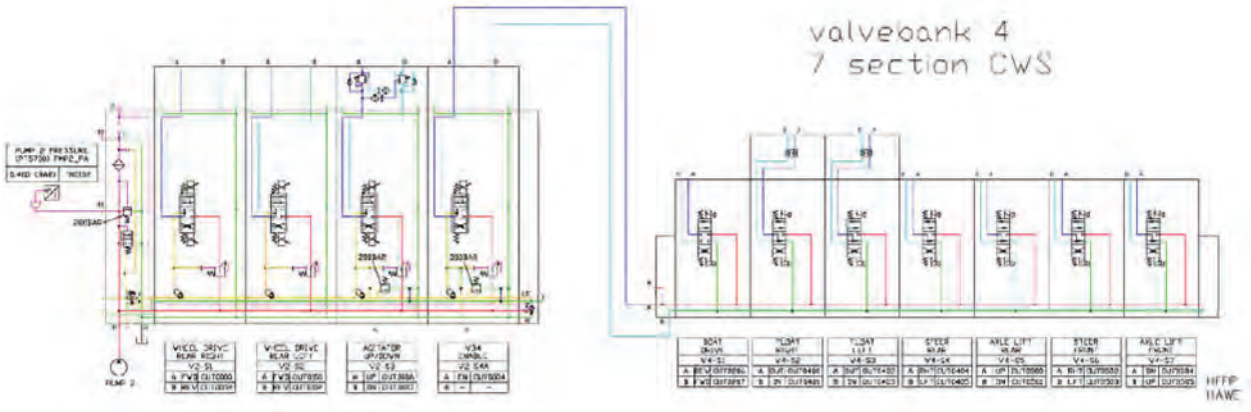
EX2044 at 6, NUHN15000046765.

469. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler further includes the schematics for the hydraulic system that powers the four hydraulic motors that power the four wheels, respectively:



EX2044 at 51, NUHN15000046810.

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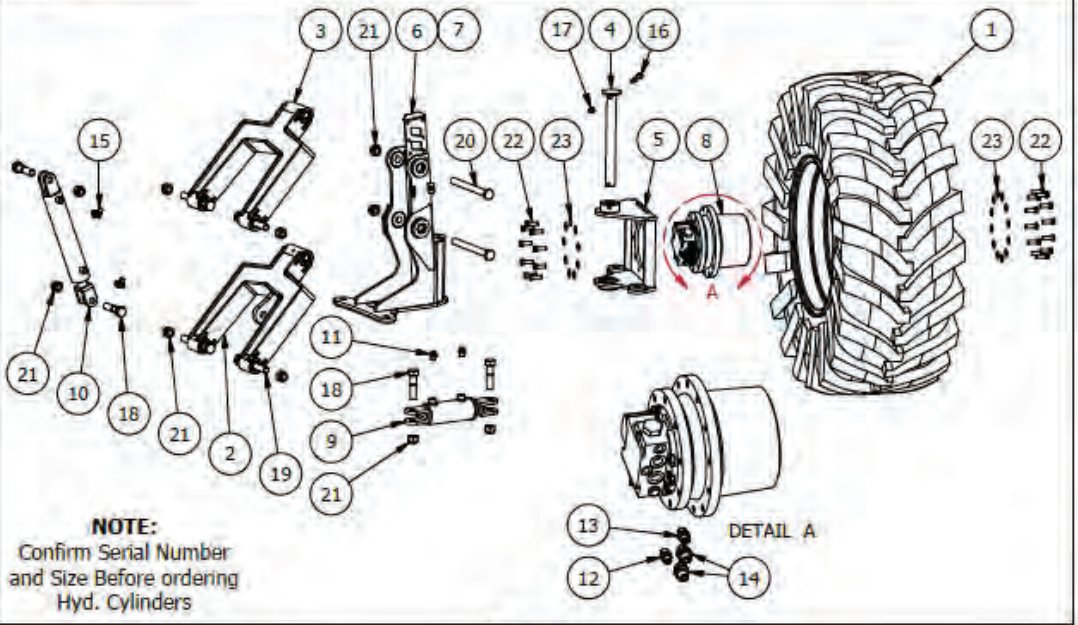
EX2044 at 52, NUHN15000046811.

470. One of the four wheels and one of the hydraulic motors are shown in the parts catalogue for Nuhn's Gen 3 Lagoon Crawler:

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NUHN — 2021 Lagoon Crawler

Wheel and A-Arm Assembly — 1000-209-02



PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-779-1	Wheel Assembly - 500/70R 24 - Alliance Tire + Nuhn Crawler Rim
2	1	100-778-2	Crawler - A-Arm with Cylinder Mount (Lower) - Heavy Box Style
3	1	100-777-2	Crawler - A-Arm (Upper) - Heavy Box Style
4	1	100-884	A-Arm Pin Assembly
5	1	100-715	Wheel Drive Mounting Bracket
6	1	106-553-1	Wheel Drive Upright Bracket - Back
7	1	100-714-1	Wheel Drive Upright Bracket - Front
8	1	103-929	Wheel Drive Motor - Nachi
9	1	Varies	Hyd. Cylinder - (Crawler Steer) - Varies Based on Crawler Model Number
10	1	103-274	Hyd. Cylinder - Welded - 3" x 12" - Clevis - Parallel Ports (Crawler Lift)
11	2	104-455	Hyd. Adaptor - Straight - #4 MORS x #8 MOR (FS6400-04-08)
12	1	104-649	Hyd. Adaptor - Straight - #6 MORS x #4 MBSPP (6002-06-04)
13	1	104-927	Hyd. Adaptor - Straight - #6 MORS x #6 MBSPP (FS6002-06-06)
14	2	104-926	Hyd. Adaptor - Straight - #8 MORS x #8 MBSPP (6002-08-08)
15	2	104-804	Hyd. Adaptor - 90° Elbow - #6 MORS x #8 MOR (FS6801-06-08)
16	1	104-321	Bolt - Hex Head - 0.5" x 3.75" - GR5
17	1	100-904	Nut - Nylock - 0.5" - GR2
18	4	100-467	Bolt - Hex Head - 1" x 4" - GR5
19	4	104-008	Bolt - Hex Head - 1" x 7.5" - GR8
20	2	104-161	Bolt - Hex Head - 1" x 10" - GR8
21	10	100-907	Nut - Nylock - 1" - GR2
22	21	100-925	Bolt - Hex Head - M14 x 40 - 8.8
23	21	104-005	Washer - Flat - 0.5625" - GR8

EX2045 at 17, NUHN15000007438 (*see* Item 8).

471. Thus it is my opinion that Nuhn's Gen 3 Lagoon Crawler has a "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic

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motor" as recited in Claim 1 of the '425 Patent.

iv. "a fluid pump for pumping liquid manure;"

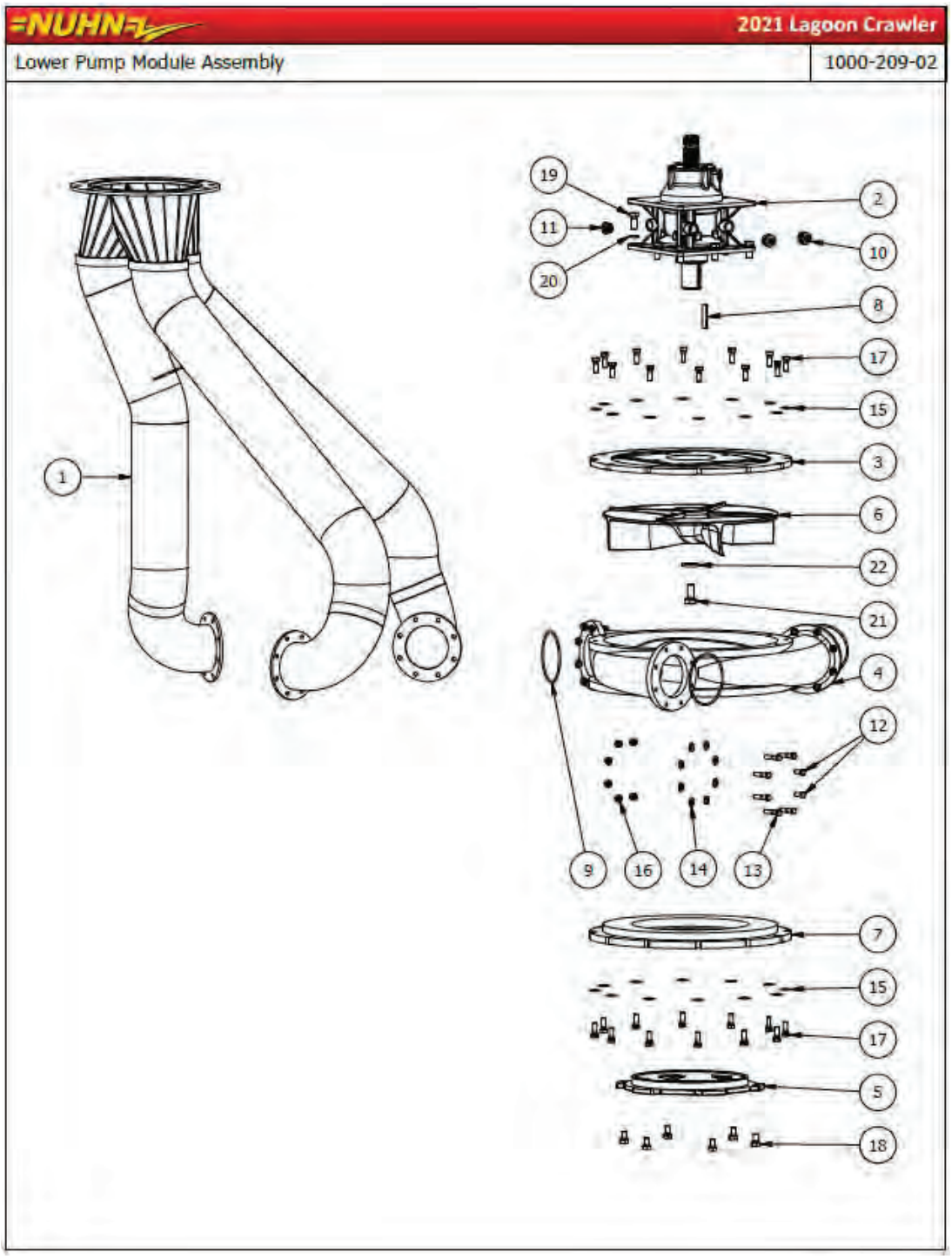
472. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes that it includes a centrifugal pump that is "[s]pecifically designed for harsh lagoon environment" and has a "[s]emi-open impellor design [that] allows large foreign material to pass through pump":

Centrifugal Pump	12" Tri Port Header Pump 12,000GPM capacity 14" pump inlet 12" pump discharge 21" diameter impeller 3 outlets off of pump housing Tungsten carbide mechanical seal *Designed to work in the harshest sand environments* *Oil bath assembly - requires very little operator maintenance* Specifically designed for harsh lagoon environment *Pump is submerged in lagoon so it will not lose its prime* *Semi-open impellor design allows large foreign material to pass through pump*

EX2044 at 6, NUHN15000046765.

473. The parts catalog for the MY2020 Gen 3 Lagoon Crawler shows the various details of the pump module with the semi-open impeller design described above:

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EX2045 at 36, NUHN15000007457 (*see* Items 1, 3, 4, 5, 6, 7).

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NUHN 2021 Lagoon Crawler

Lower Pump Module Assembly 1000-209-02

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-525	Crawler - 12" Triple Port Header
2	1	100-820-5	Mechanical Seal and Bearing Unit - 2.25" Cast Complete
3	1	105-229	20.5" Triple Port Pump - Top Housing Cover - Finished - 1A
4	1	105-228	20.5" Triple Port Pump - Cast Housing 20.5" - Finished - 1A
5	1	107-550	20.5" Triple Port Pump - 14" Bottom Inlet Chopper - Finished - 2A
6	1	107-548-1	20.5" Triple Port Pump - 20.38" Impeller - Cast - 4 Blade
7	1	106-792	20.5" Triple Port Pump - Cast Inlet Cover - 14" Inlet With Flange - 2A
8	1	102-399 x 2.75	0.5" x 0.5" Keystock
9	3	103-968	O-Ring - #359 DAE Buna - 6.125"OD x 5.75"ID
10	2	109-925	Hyd. Adaptor - Straight - #12 MBSPP x 6 MORS
11	1	106-695	Hyd. Fitting - Drain Plug - #12MBSPP - 12mm Hex Key
12	6	109-940	Bolt - Hex Head - 0.4375" x 1" - GR8
13	18	109-921	Bolt - Hex Head - 0.4375" x 2" - GR8
14	24	107-282	Washer - Flat - 0.4375" x 0.922" OD - GR8
15	24	100-897	Washer - Flat - 0.4375" x 1.25" OD - GR2
16	18	106-117	Nut - Nylock - 0.4375" - GR8
17	24	104-911	Bolt - Hex Head - 0.5" x 1.375" - GR5
18	6	101-057	Bolt - Hex Head - 0.625" x 1" - GR5
19	8	101-022	Bolt - Hex Head - 0.625" x 1.5" - GR5
20	8	101-187	Washer - Lock - 0.625" Medium Split
21	1	109-229	Bolt - Hex Head - 0.75" x 1.75" - GR8
22	1	109-186	Plate - Weld On Hex Washer - 0.75"

EX2045 at 37, NUHN15000007458.

474. The brochure for the Gen 3 Lagoon Crawler describes that the "header pump is located on the bottom of the Crawler, and is submerged at all times. That means that there are no systems required to prime the pump":

Agitation Made Easy

NO PRIMING REQUIRED

The header pump is located on the bottom of the Crawler, and is submerged at all times. That means that there are no systems re- quired to prime the pump.

PROFITABLE AGITATION

The Lagoon Crawler is the best way to agitate lagoons. A better mix will give a higher con- centration of nutrients in the manure and will increase crop yield. The Crawler blasts away sand and solid buildup increasing storage and it eliminates the costly expense of additional cleaning out once the lagoon has been pumped out.

EX2043 at 1, NUHN15000007241.

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475. Thus it is my opinion that Nuhn's Gen 3 Lagoon Crawler has "a fluid pump for pumping liquid manure" as recited in Claim 1 of the '425 Patent.

v. "a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump; and,"

476. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes that its power source is a CAT Diesel Tier 4 engine:

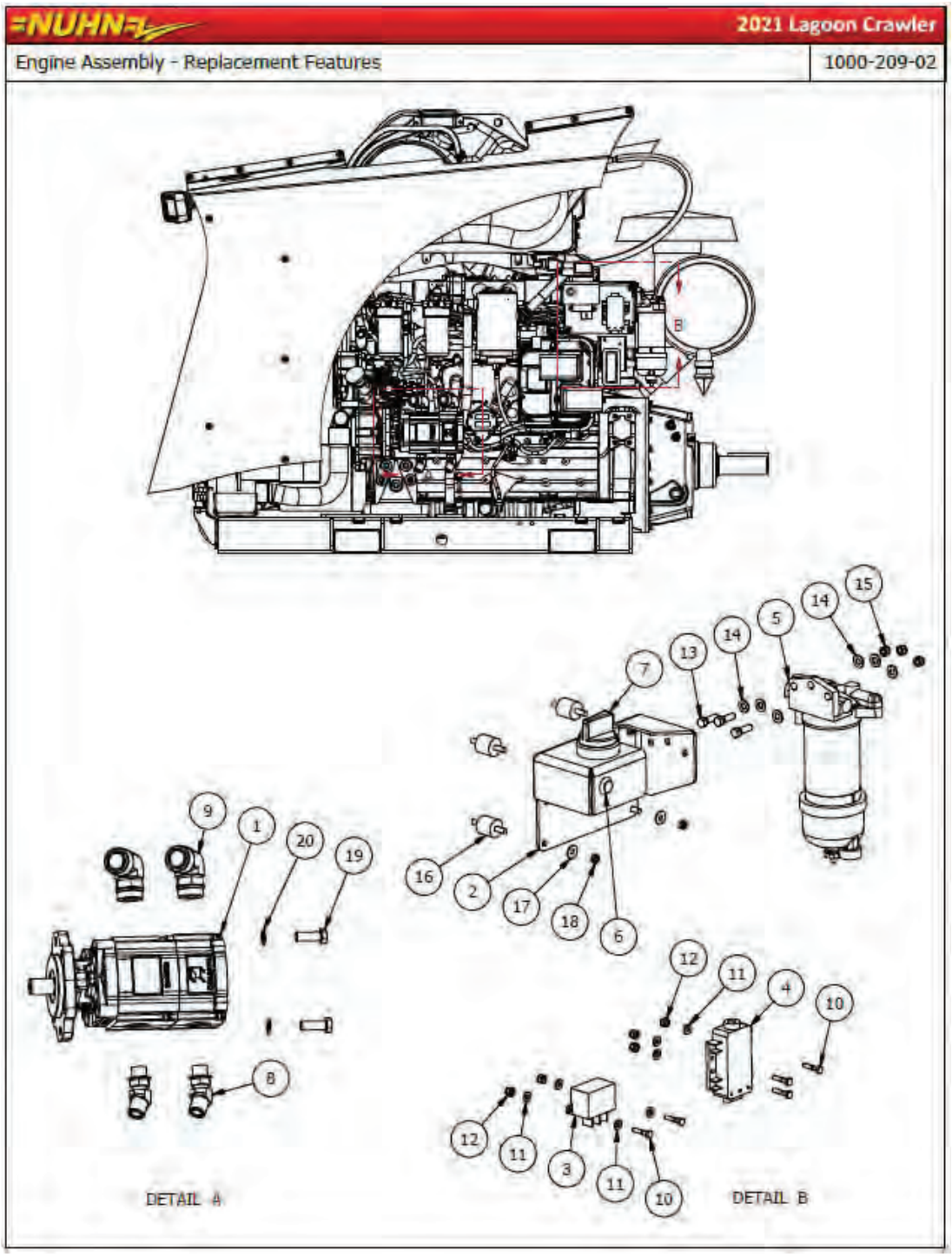
2.4 TECHINICAL SPECIFICATIONS

Engine	CAT Diesel Tier 4 Motor Max. Power: 302HP, 225kW Max. Torque: 935lb-ft @ 1400rpm, 1268Nm @ 1400rpm Emissions: U.S. EPA Tier 4 Final Nonroad

EX2044 at 6, NUHN15000046765.

477. The engine assembly is shown in the parts catalog for the MY2021 Gen 3 Lagoon Crawler:

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EX2045 at 24, NUHN15000007445.

478. The power source of Nuhn's Gen 3 Lagoon Crawler is connected to a hydraulic pump. Specifically, the hydraulic pump is a double Casappa pump. It is my understanding that the

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hydraulic pump is connected to and directly driven by the engine. This arrangement is shown above, with the hydraulic pump (Item 1) shown specifically in Detail A. The hydraulic pump is referenced in the parts catalog of Nuhn's Gen 3 Lagoon Crawler:

NUHN — 2021 Lagoon Crawler

Engine Assembly - Replacement Features — 1000-209-02

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	110-090	Double Casappa Pump - Splined Shaft - KP30.27
2	1	110-059	CAT Engine - T4 - Fuse Box Mounting Bracket
3	1	106-868	CAT Engine - T4 - 12V Relay
4	1	106-867	CAT Engine - T4 - Fuse Box
5	1	106-636	CAT Engine - T4 - Fuel Water Separator - Filter
6	1	107-609	DEF Purge Light - Grote LED 2 Wire - Red
7	1	100-817	Engine Harness Master Switch
8	2	104-449	Hyd. Adapter - 45° Elbow - #12 MORS x #12 MOR (6802-12-12)
9	2	107-139	Hyd. Adaptor - 90° Elbow - #20 MORS x #20 MOR (6801-20-20)
10	5	103-125	Bolt - Hex Head - 0.25" x 1.25" - GR5
11	7	101-019	Washer - Flat - 0.25"
12	5	102-521	Nut - Nylock - 0.25" - GR2
13	3	101-034	Bolt - Hex Head - 0.375" x 1.25" - GR5
14	6	101-001	Washer - Flat - 0.375"
15	3	100-902	Nut - Nylock - 0.375" - GR2
16	4	106-453	Rubber Hood Insulator - M8 x 1.25
17	4	101-020	Washer - Flat - 0.3125"
18	4	106-432	Nut - Nylock - M8
19	2	110-023	Bolt - Hex Head - M14 x 40 - GR10.9
20	2	107-098	Washer - Lock - M14

EX2045 at 25, NUHN15000007446.

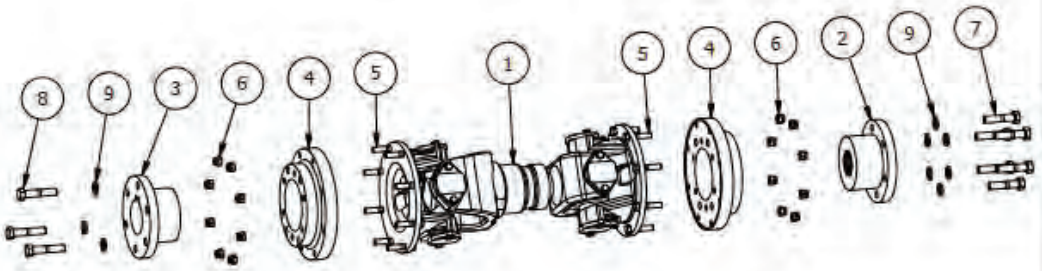
479. It is my understanding that this hydraulic pump is hydraulically connected to the four hydraulic wheel motors. That is, I understand that when the hydraulic pump is powered by the engine, it pressurizes hydraulic fluid, which can be used to power the four hydraulic wheel motors. Thus, the power source is configured to provide power to the ground engaging propulsion structure.

480. Additionally, the power source is also configured to provide power to the fluid pump of Nuhn's Gen 3 Lagoon Crawler. Specifically, the engine is connected to and powers the fluid pump by a horizontal drive shaft assembly, a gear box assembly, and a vertical driveshaft. Each of these are shown in the parts catalog for Nuhn's Gen 3 Lagoon Crawler:

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NUHN 2021 Lagoon Crawler

Crawler - Drive Line Assembly 1000-209-02

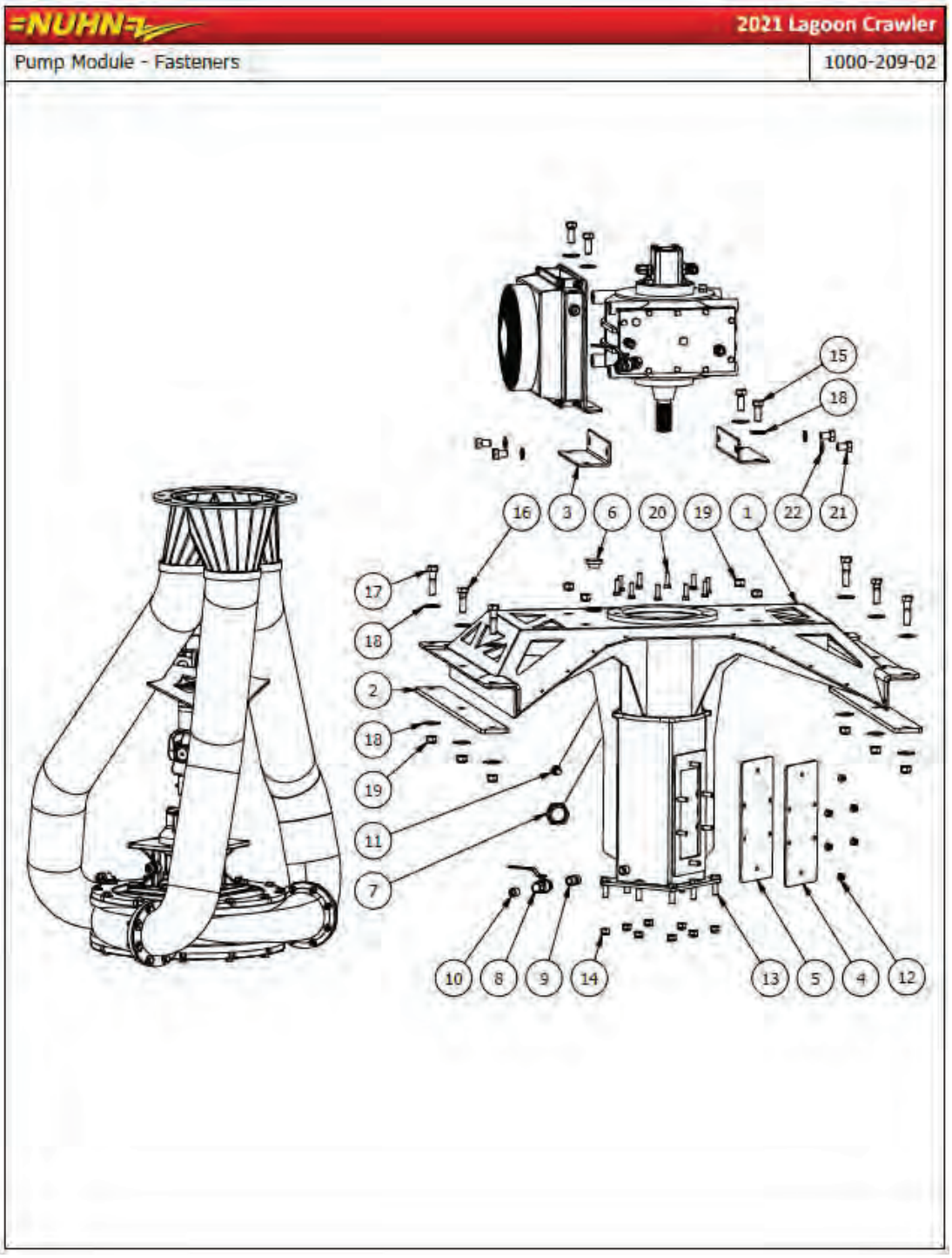


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-729	Horizontal Drive Shaft Assembly - 1710 Series
2	1	104-680	Crawler - Taper Lock Bushing - Spline (Gear Box)
3	1	104-681	Crawler - Taper Lock Bushing - Keyway (Engine)
4	2	104-682	Crawler - E Taper Lock Female to 1710
5	16	100-908	Bolt - Hex Head - 0.375" x 1.75" - GR5
6	16	100-902	Nut - Nylock - 0.375" - GR2
7	6	104-319	Bolt - Hex Head - 0.5" x 2.25" - GR5
8	3	106-876	Bolt - Hex Head - 0.5" x 2.75" - GR8 - Black Oxide
9	9	100-900	Washer - Lock - 0.5" - Medium Split

EX2045 at 31, NUHN15000007452.

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EX2045 at 32, NUHN15000007453.

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NUHN — 2021 Lagoon Crawler

Pump Module - Fasteners — 1000-209-02

PARTS LIST

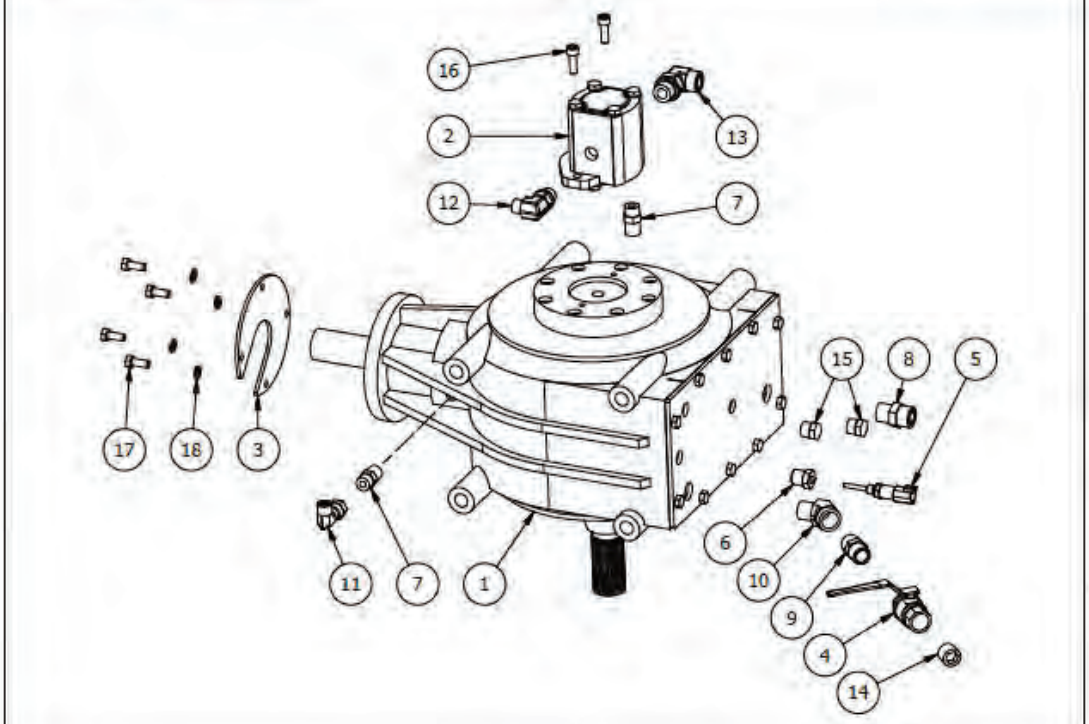
ITEM	QTY	PART NUMBER	TITLE
1	1	110-601	2021 Crawler - Pump Frame
2	2	109-918-1	2021 Lagoon Crawler Pump Tower - Rubber Isolator Strips
3	2	106-528	Gearbox Brace - Angle Iron
4	1	104-527	Clean-Out Door - 15" x 7" x 0.25" - 6 Hole - No Sight Glass
5	1	102-651	Gasket - Clean-Out Door - 14" x 6.75" x 0.25" - 6 Hole - Solid
6	1	103-489	Vacuum Pump - Flush Port Cap
7	1	101-449	Sight Glass - 2" MP - Complete
8	1	102-166	Ball Valve - Brass - 0.75"
9	1	101-536	Hyd. Adaptor - Straight - #12 MP x #12 MP (5404-12-12)
10	1	106-924	Hyd. Fitting - Plug - #12 MP (6406-SHP-08)
11	1	103-809	Hyd. Fitting - Plug - Hooded Breather - #6 MP (313650)
12	6	100-904	Nut - Nylock - 0.5" - GR2
13	8	101-059	Bolt - Hex Head - 0.625" x 2" - GR5
14	8	100-905	Nut - Nylock - 0.625" - GR2
15	4	101-206	Bolt - Hex Head - 0.75" x 2" - GR5
16	2	101-207	Bolt - Hex Head - 0.75" x 2.5" - GR5
17	4	101-208	Bolt - Hex Head - 0.75" x 3" - GR5
18	16	101-202	Washer - Flat - 0.75"
19	10	101-201	Nut - Nylock - 0.75" - GR2
20	10	100-924	Bolt - Hex Head - M12 x 40 - 8.8
21	4	104-116	Bolt - Hex Head - M20 x 30 - 8.8
22	4	104-208	Washer - Lock - M20

EX2045 at 33, NUHN15000007454.

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NUHN 2021 Lagoon Crawler

Crawler - Gear Box Assembly 1000-209-02

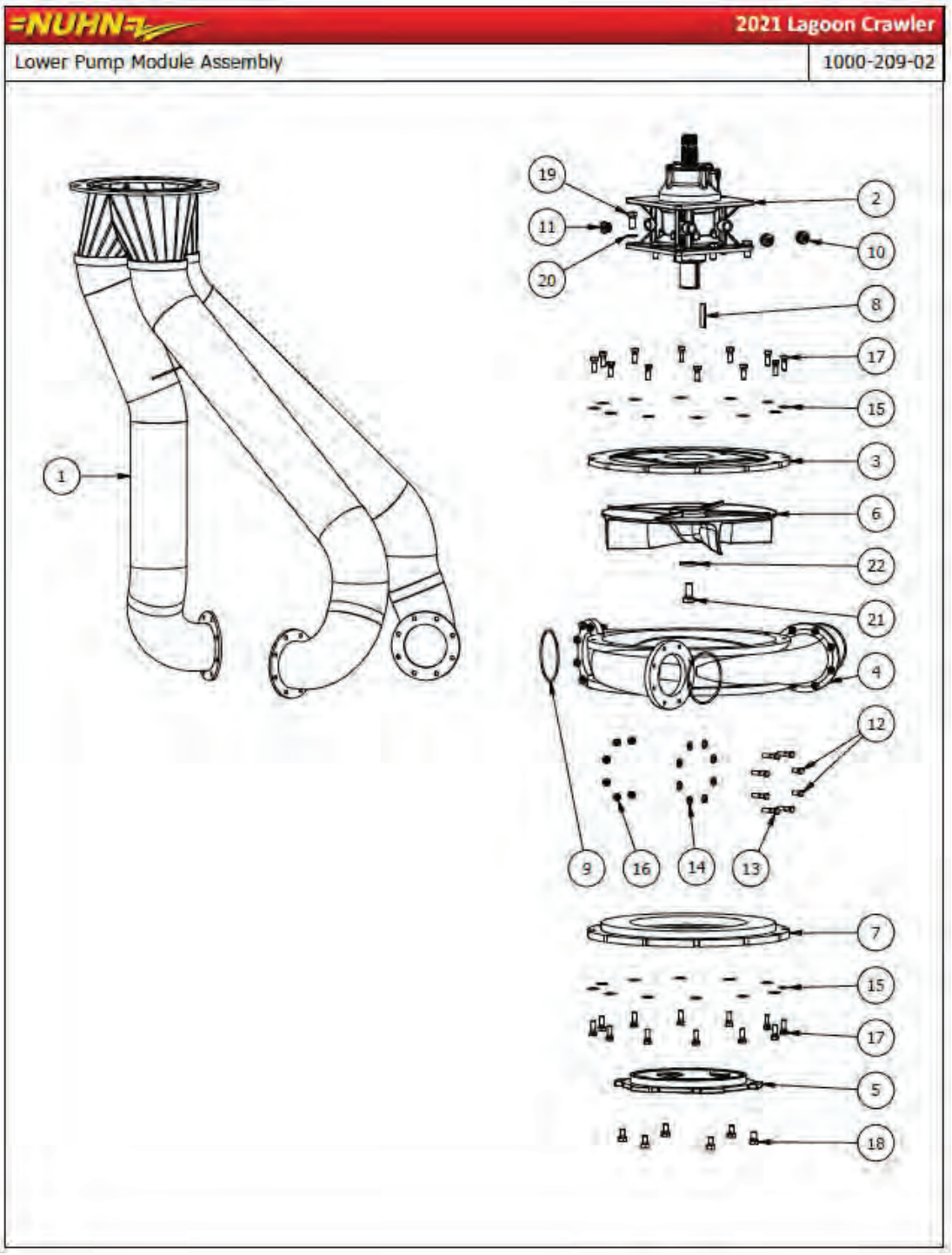


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	100-950-1	Crawler - Gear Box - T-332A - With Pump Pad
2	1	106-097	Crawler - Hydraulic - Pump PLP20.16D
3	1	104-497	Gear Box Seal Guard
4	1	102-166	Ball Valve - Brass - 0.75"
5	1	109-208	Sensor Liquid Temperature - 50 to 150°C - #4 MBSPP - 3 Pin DT
6	1	109-191	Hyd. Adaptor - Straight - #8 MP x #4 FBSPP (9037-0804)
7	2	104-831	Hyd. Adaptor - Straight - #8 MORS x #8 MP (FS2404-08-08)
8	1	104-707	Hyd. Adaptor - Straight - #12 MORS x #12 MP (FS2404-12-12)
9	1	101-536	Hyd. Adaptor - Straight - #12 MP x #12 MP (5404-12-12)
10	1	106-646	Hyd. Adaptor - 45° Elbow - #12 MP x #12 FP (5503-12-12)
11	1	104-825	Hyd. Adapter - 90° Elbow - #8 MORS x #8 FORSX (FS6500-08-08)
12	1	104-810	Hyd. Adaptor - 90° Elbow - #8 MORS x #10 MOR (FS6801-08-10)
13	1	104-814	Hyd. Adaptor - 90° Elbow - #12 MORS x #12 MOR (6801-12-12)
14	1	106-924	Hyd. Fitting - Plug - #12 MP (6406-SHP-08)
15	2	101-805	Hyd. Fitting - Plug - #8 MP Square (5406HP08)
16	2	107-092	Bolt - Socket Head - M10 x 30 - 12.9
17	4	103-377	Bolt - Hex Head - M10 x 30 - 8.8
18	4	105-094	Washer - Lock - M10

EX2045 at 34, NUHN15000007455.

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EX2045 at 36, NUHN15000007457.

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NUHN 2021 Lagoon Crawler

Lower Pump Module Assembly 1000-209-02

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-525	Crawler - 12" Triple Port Header
2	1	100-820-5	Mechanical Seal and Bearing Unit - 2.25" Cast Complete
3	1	105-229	20.5" Triple Port Pump - Top Housing Cover - Finished - 1A
4	1	105-228	20.5" Triple Port Pump - Cast Housing 20.5" - Finished - 1A
5	1	107-550	20.5" Triple Port Pump - 14" Bottom Inlet Chopper - Finished - 2A
6	1	107-548-1	20.5" Triple Port Pump - 20.38" Impeller - Cast - 4 Blade
7	1	106-792	20.5" Triple Port Pump - Cast Inlet Cover - 14" Inlet With Flange - 2A
8	1	102-399 x 2.75	0.5" x 0.5" Keystock
9	3	103-968	O-Ring - #359 DAE Buna - 6.125"OD x 5.75"ID
10	2	109-925	Hyd. Adaptor - Straight - #12 MBSPP x 6 MORS
11	1	106-695	Hyd. Fitting - Drain Plug - #12MBSPP - 12mm Hex Key
12	6	109-940	Bolt - Hex Head - 0.4375" x 1" - GR8
13	18	109-921	Bolt - Hex Head - 0.4375" x 2" - GR8
14	24	107-282	Washer - Flat - 0.4375" x 0.922" OD - GR8
15	24	100-897	Washer - Flat - 0.4375" x 1.25" OD - GR2
16	18	106-117	Nut - Nylock - 0.4375" - GR8
17	24	104-911	Bolt - Hex Head - 0.5" x 1.375" - GR5
18	6	101-057	Bolt - Hex Head - 0.625" x 1" - GR5
19	8	101-022	Bolt - Hex Head - 0.625" x 1.5" - GR5
20	8	101-187	Washer - Lock - 0.625" Medium Split
21	1	109-229	Bolt - Hex Head - 0.75" x 1.75" - GR8
22	1	109-186	Plate - Weld On Hex Washer - 0.75"

EX2045 at 37, NUHN15000007458.

481. Thus it is my opinion that Nuhn's Gen 3 Lagoon Crawler has "a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump" as recited in Claim 1 of the '425 Patent.

vi. "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 fluid 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."

482. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes that all of the machine operations are controlled through wireless remote control. It describes that the wireless remote control is 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 fluid 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

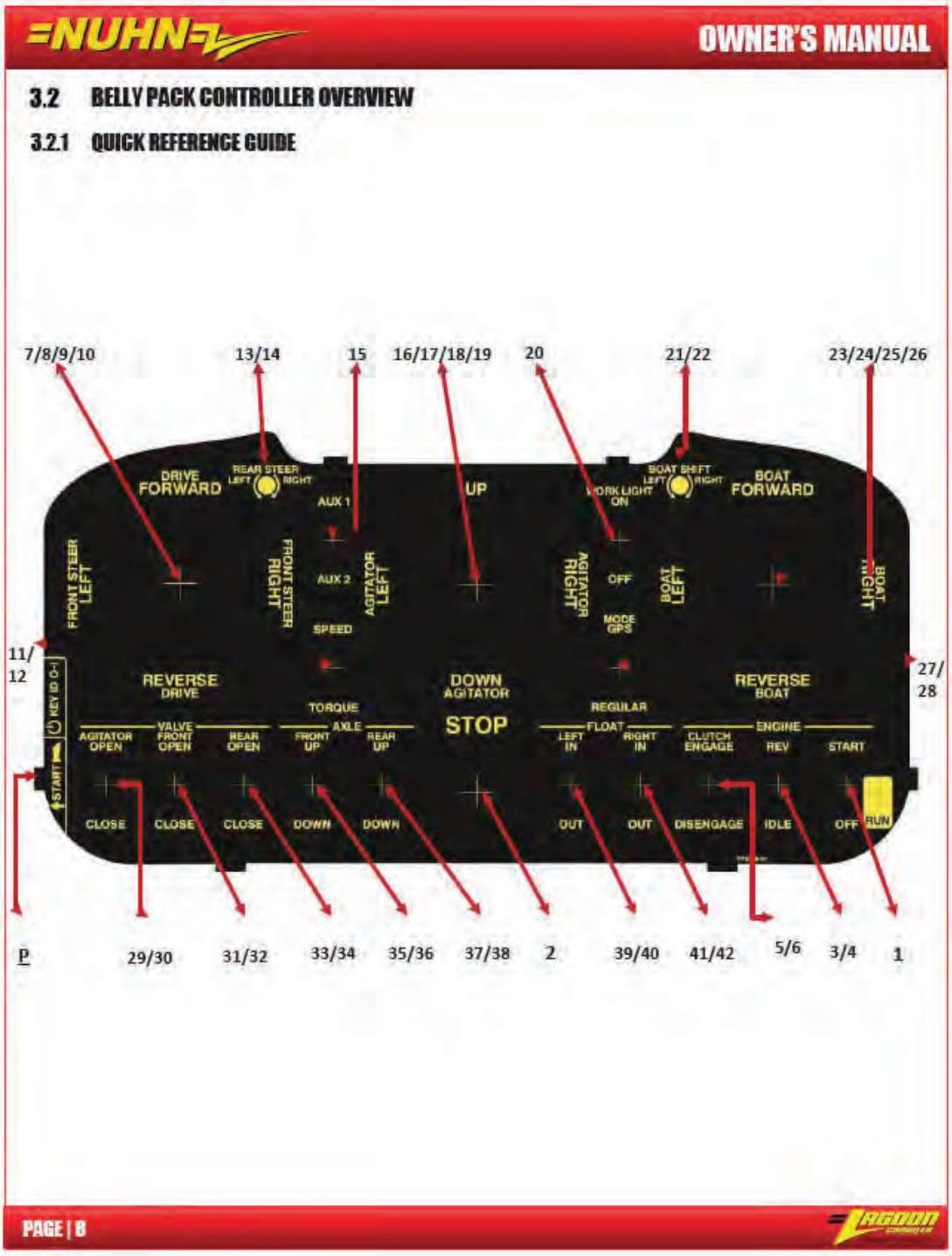
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when the vehicle is floating:

User Interface	Complete Wireless Control All of the machine operation functions are controlled through the remote 50 hour battery life Functions: *Boat forward/reverse, as well as speed control* *Boat rotate left/right* *Boat shift left/right* *Drive forward/reverse* *Steer left/right* *Axle raise/lower* *Agitation gun movements* *Engine start/stop* *Engine throttle increase/decrease* *Clutch engage/disengage*

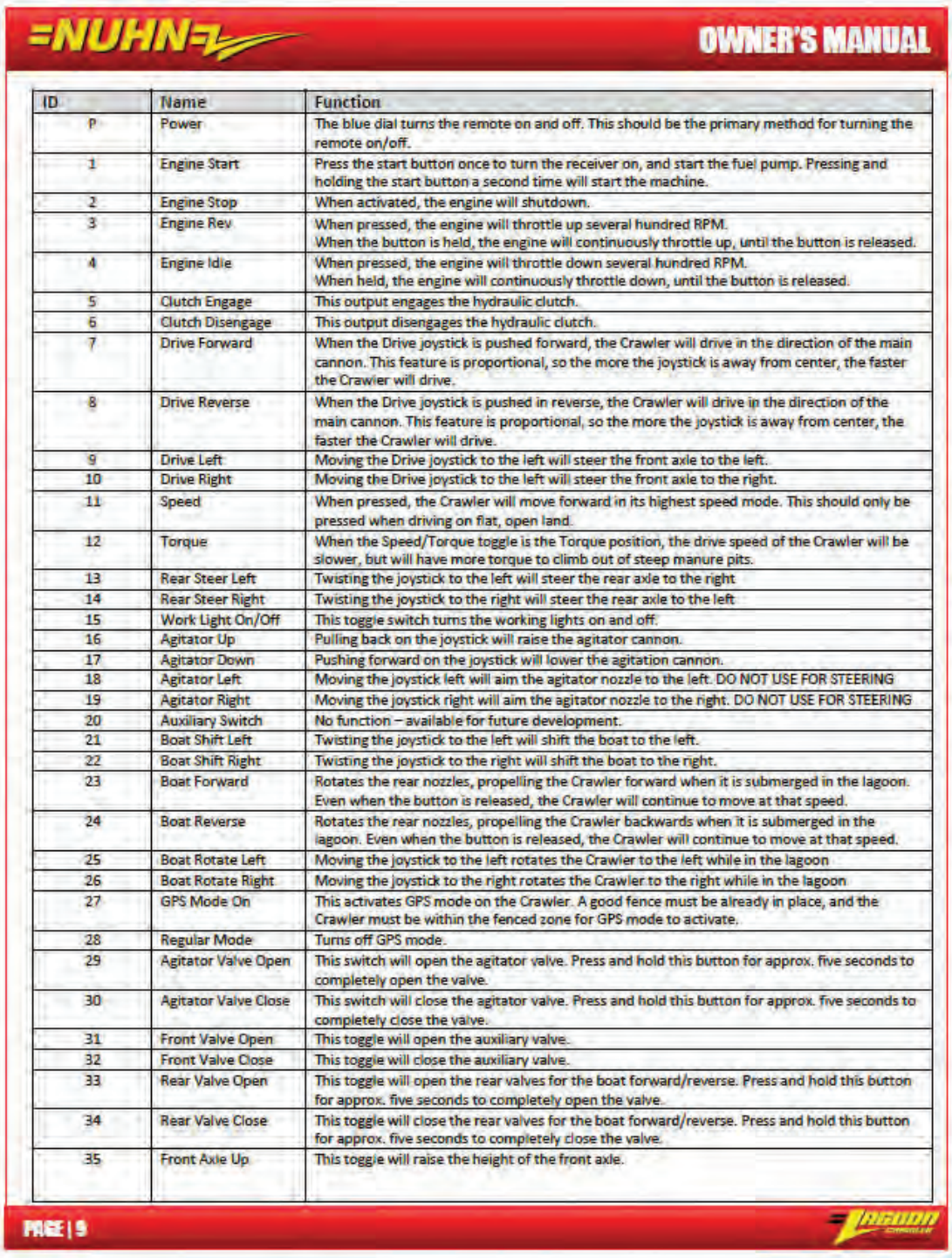
EX2044 at 6, NUHN15000046765.

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EX2044 at 8, NUHN15000046767.

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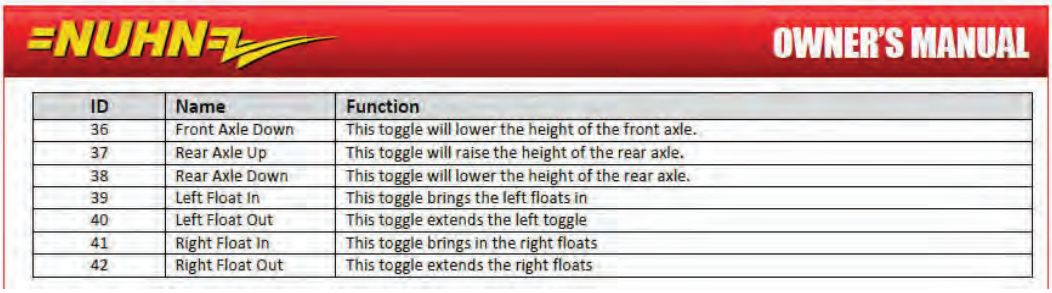
NUHN OWNER'S MANUAL

ID	Name	Function
P	Power	The blue dial turns the remote on and off. This should be the primary method for turning the remote on/off.
1	Engine Start	Press the start button once to turn the receiver on, and start the fuel pump. Pressing and holding the start button a second time will start the machine.
2	Engine Stop	When activated, the engine will shutdown.
3	Engine Rev	When pressed, the engine will throttle up several hundred RPM. When the button is held, the engine will continuously throttle up, until the button is released.
4	Engine Idle	When pressed, the engine will throttle down several hundred RPM. When held, the engine will continuously throttle down, until the button is released.
5	Clutch Engage	This output engages the hydraulic clutch.
6	Clutch Disengage	This output disengages the hydraulic clutch.
7	Drive Forward	When the Drive joystick is pushed forward, the Crawler will drive in the direction of the main cannon. This feature is proportional, so the more the joystick is away from center, the faster the Crawler will drive.
8	Drive Reverse	When the Drive joystick is pushed in reverse, the Crawler will drive in the direction of the main cannon. This feature is proportional, so the more the joystick is away from center, the faster the Crawler will drive.
9	Drive Left	Moving the Drive joystick to the left will steer the front axle to the left.
10	Drive Right	Moving the Drive joystick to the left will steer the front axle to the right.
11	Speed	When pressed, the Crawler will move forward in its highest speed mode. This should only be pressed when driving on flat, open land.
12	Torque	When the Speed/Torque toggle is the Torque position, the drive speed of the Crawler will be slower, but will have more torque to climb out of steep manure pits.
13	Rear Steer Left	Twisting the joystick to the left will steer the rear axle to the right
14	Rear Steer Right	Twisting the joystick to the right will steer the rear axle to the left
15	Work Light On/Off	This toggle switch turns the working lights on and off.
16	Agitator Up	Pulling back on the joystick will raise the agitator cannon.
17	Agitator Down	Pushing forward on the joystick will lower the agitation cannon.
18	Agitator Left	Moving the joystick left will aim the agitator nozzle to the left. DO NOT USE FOR STEERING
19	Agitator Right	Moving the joystick right will aim the agitator nozzle to the right. DO NOT USE FOR STEERING
20	Auxiliary Switch	No function – available for future development.
21	Boat Shift Left	Twisting the joystick to the left will shift the boat to the left.
22	Boat Shift Right	Twisting the joystick to the right will shift the boat to the right.
23	Boat Forward	Rotates the rear nozzles, propelling the Crawler forward when it is submerged in the lagoon. Even when the button is released, the Crawler will continue to move at that speed.
24	Boat Reverse	Rotates the rear nozzles, propelling the Crawler backwards when it is submerged in the lagoon. Even when the button is released, the Crawler will continue to move at that speed.
25	Boat Rotate Left	Moving the joystick to the left rotates the Crawler to the left while in the lagoon
26	Boat Rotate Right	Moving the joystick to the right rotates the Crawler to the right while in the lagoon
27	GPS Mode On	This activates GPS mode on the Crawler. A good fence must be already in place, and the Crawler must be within the fenced zone for GPS mode to activate.
28	Regular Mode	Turns off GPS mode.
29	Agitator Valve Open	This switch will open the agitator valve. Press and hold this button for approx. five seconds to completely open the valve.
30	Agitator Valve Close	This switch will close the agitator valve. Press and hold this button for approx. five seconds to completely close the valve.
31	Front Valve Open	This toggle will open the auxiliary valve.
32	Front Valve Close	This toggle will close the auxiliary valve.
33	Rear Valve Open	This toggle will open the rear valves for the boat forward/reverse. Press and hold this button for approx. five seconds to completely open the valve.
34	Rear Valve Close	This toggle will close the rear valves for the boat forward/reverse. Press and hold this button for approx. five seconds to completely close the valve.
35	Front Axle Up	This toggle will raise the height of the front axle.

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EX2044 at 9, NUHN15000046768.

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NUHN OWNER'S MANUAL

ID	Name	Function
36	Front Axle Down	This toggle will lower the height of the front axle.
37	Rear Axle Up	This toggle will raise the height of the rear axle.
38	Rear Axle Down	This toggle will lower the height of the rear axle.
39	Left Float In	This toggle brings the left floats in
40	Left Float Out	This toggle extends the left toggle
41	Right Float In	This toggle brings in the right floats
42	Right Float Out	This toggle extends the right floats

EX2044 at 10, NUHN15000046769.

483. The radio remote (Item 1) and the remote control receiver (Item 2) are shown in the parts catalog for Nuhn's Gen 3 Lagoon Crawler:

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NUHN — 2021 Lagoon Crawler

Crawler Remote and Chargers — 1000-209-02



PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	109-212	Crawler - Radio Remote - Transmitter Only - No ID Key
2	1	110-561	Crawler - CRD Receiver Only - No ID Key
3	1	109-213	Crawler - Radio ID Key Set (TX and RX)
4	1	109-161	Crawler - Battery - LPM04-Li-ION
5	1	110-747	Crawler - Car Style Battery Charger Cable Only - DC Adapter
6	1	109-151	Crawler - Battery Charger and Car Style Cable - Combo
7	1	109-150	Crawler - Battery Charger and Wall Style Cable - Combo

EX2045 at 15, NUHN15000007436.

484. Thus it is my opinion that Nuhn's Gen 3 Lagoon Crawler has "a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground

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engaging propulsion structure; (2) control a flow of liquid manure from the fluid 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" as recited in Claim 1 of the '425 Patent.

485. Therefore, in view of the above, it is my opinion that the claims of the '425 Patent cover Nuhn's Gen 3 Lagoon Crawler and that Nuhn's Gen 3 Lagoon Crawler is commensurate with the scope of the claims of the '425 Patent.

4. NUHN'S CRAWLER X

486. It is my opinion that the claims of the '425 Patent cover Nuhn's Crawler X and that Nuhn's Gen 3 Lagoon Crawler is commensurate with the scope of the claims of the '425 Patent.

i. "An amphibious vehicle"

487. The Crawler X is an amphibious vehicle.

488. For example, the brochure for the Crawler X shows it floating in liquid manure and shows it on land:

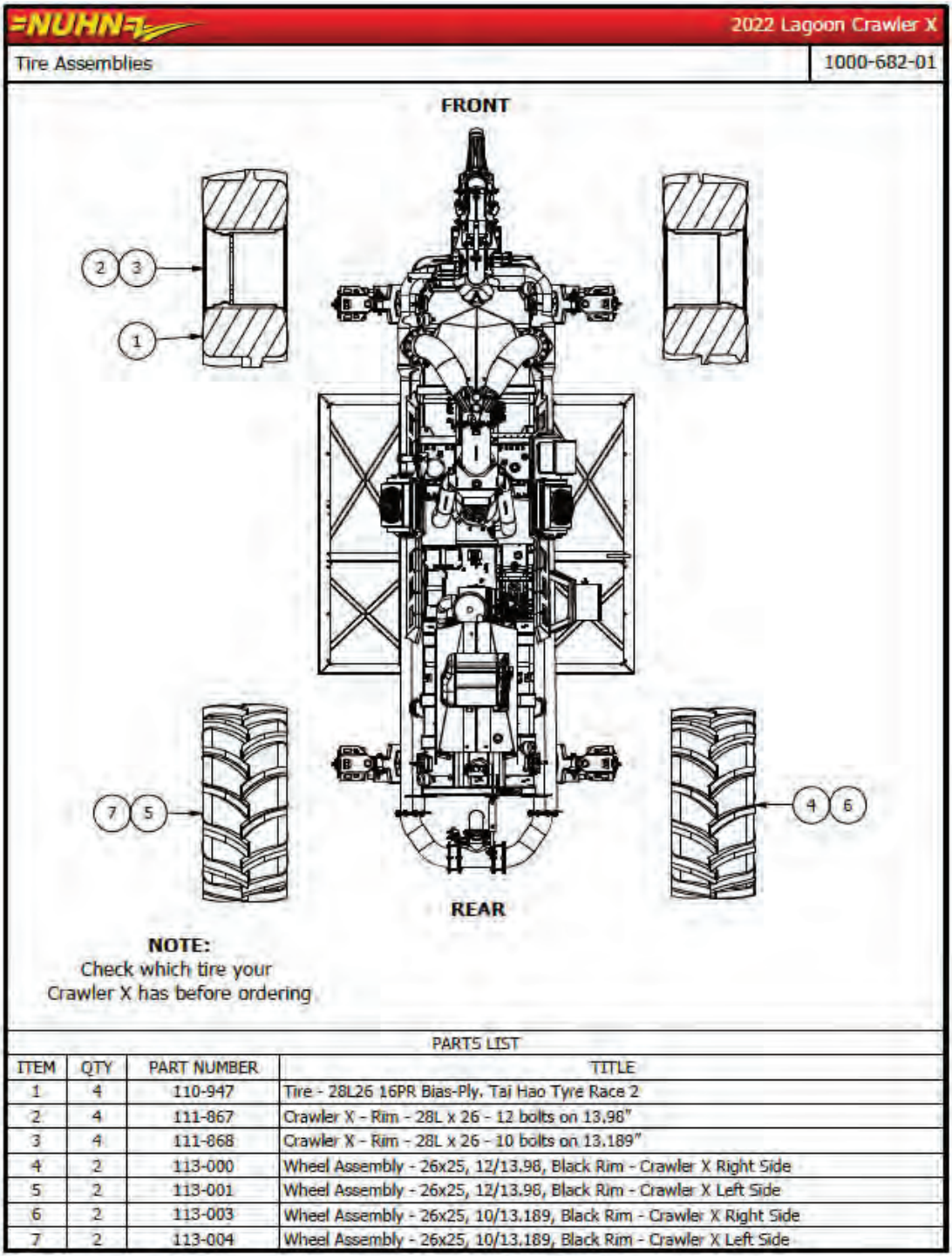
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EX2046 at 2, NUHN15000007248.

489. The parts catalog for the Crawler X shows that it is a vehicle with four wheels:

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	4	110-947	Tire - 28L26 16PR Bias-Ply, Tai Hao Tyre Race 2
2	4	111-867	Crawler X - Rim - 28L x 26 - 12 bolts on 13.98"
3	4	111-868	Crawler X - Rim - 28L x 26 - 10 bolts on 13.189"
4	2	113-000	Wheel Assembly - 26x25, 12/13.98, Black Rim - Crawler X Right Side
5	2	113-001	Wheel Assembly - 26x25, 12/13.98, Black Rim - Crawler X Left Side
6	2	113-003	Wheel Assembly - 26x25, 10/13.189, Black Rim - Crawler X Right Side
7	2	113-004	Wheel Assembly - 26x25, 10/13.189, Black Rim - Crawler X Left Side

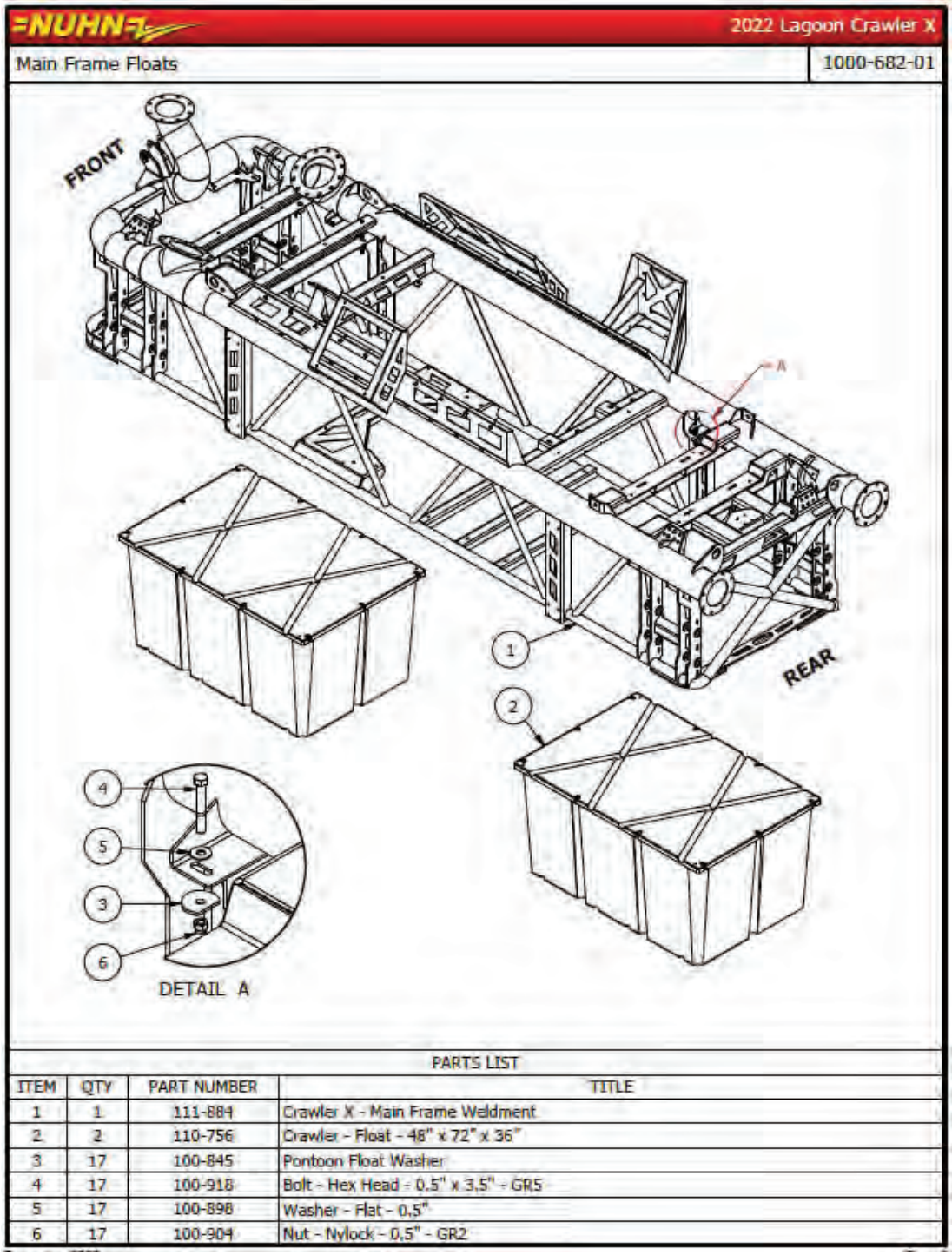
EX2047 at 42, NUHN15000007305.

490. Thus it is my opinion that Nuhn's Crawler X is an "amphibious vehicle" as recited in Claim 1 of the '425 Patent.

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ii. "a floatable vehicle body;"

491. The parts catalog for the Crawler X illustrates and describes the floats that are included with the Crawler X:

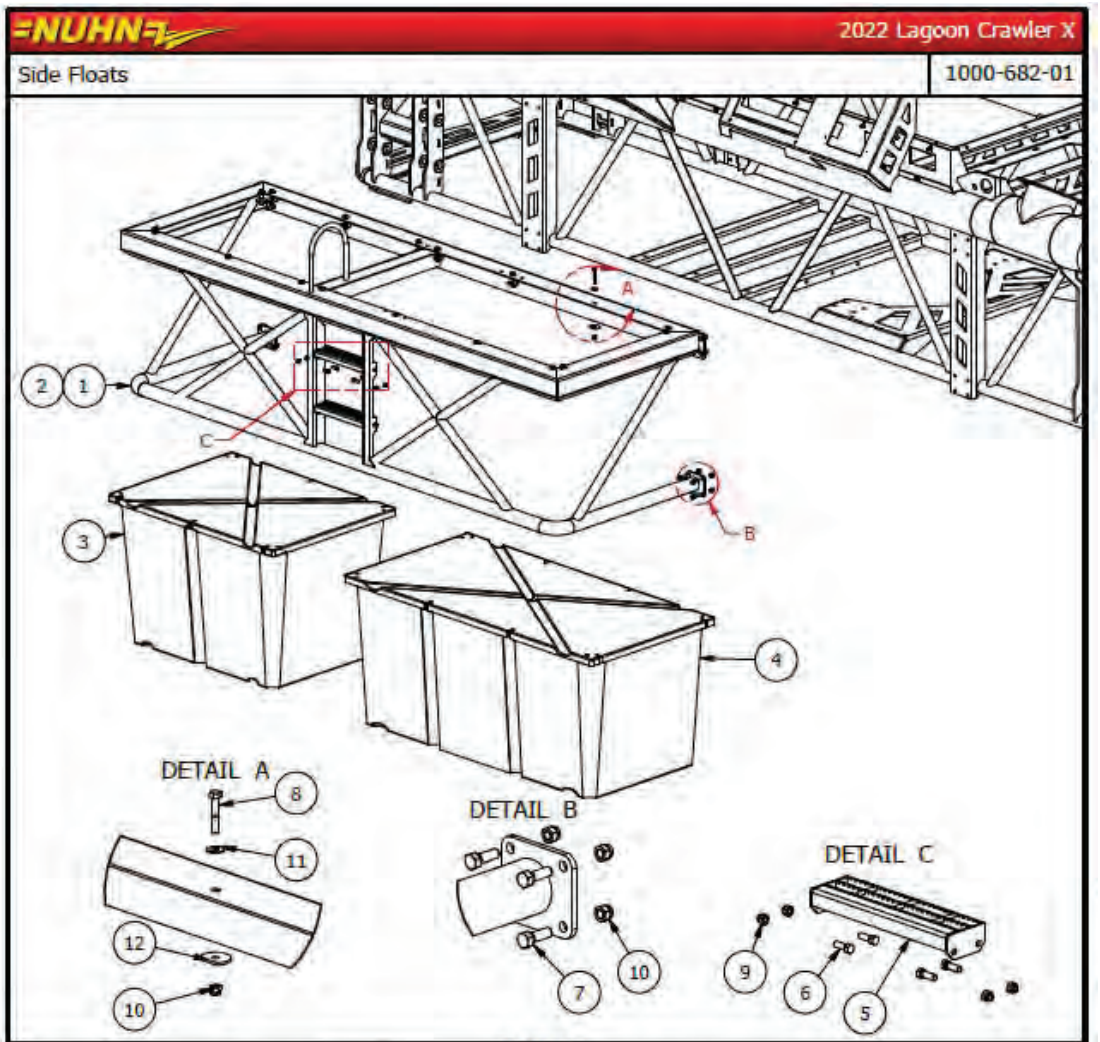


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	111-884	Crawler X - Main Frame Weldment
2	2	110-756	Crawler - Float - 48" x 72" x 36"
3	17	100-845	Pontoon Float Washer
4	17	100-918	Bolt - Hex Head - 0.5" x 3.5" - GR5
5	17	100-898	Washer - Flat - 0.5"
6	17	100-904	Nut - Nylock - 0.5" - GR2

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EX2047 at 3, NUHN15000007266 (*see* Item 2).



PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	111-885	Crawler X - Side Float - Right Side Frame (ladder)
2	1	112-390	Crawler X - Side Float - Left Side Frame (no ladder)
3	1	106-494	Pontoon Float - 36" x 48" x 32"
4	1	106-495	Pontoon Float - 36" x 72" x 32"
5	2	112-301	Ladder Step - 14" x 3.8" x 2" Tall
6	8	100-909	Bolt - Hex Head - 0.4375" x 1.25" - GR5
7	16	100-914	Bolt - Hex Head - 0.5" x 1.5" - GR5
8	18	104-153	Bolt - Hex Head - 0.5" x 2.75" - GR5
9	8	100-903	Nut - Nylock - 0.4375" - GR2
10	34	100-904	Nut - Nylock - 0.5" - GR2
11	18	100-898	Washer - Flat - 0.5"
12	18	100-845	Pontoon Float Washer

EX2047 at 4, NUHN15000007267 (*see* Items 3, 4).

492. Thus it is my opinion that Nuhn's Crawler X has "a floatable vehicle body" as

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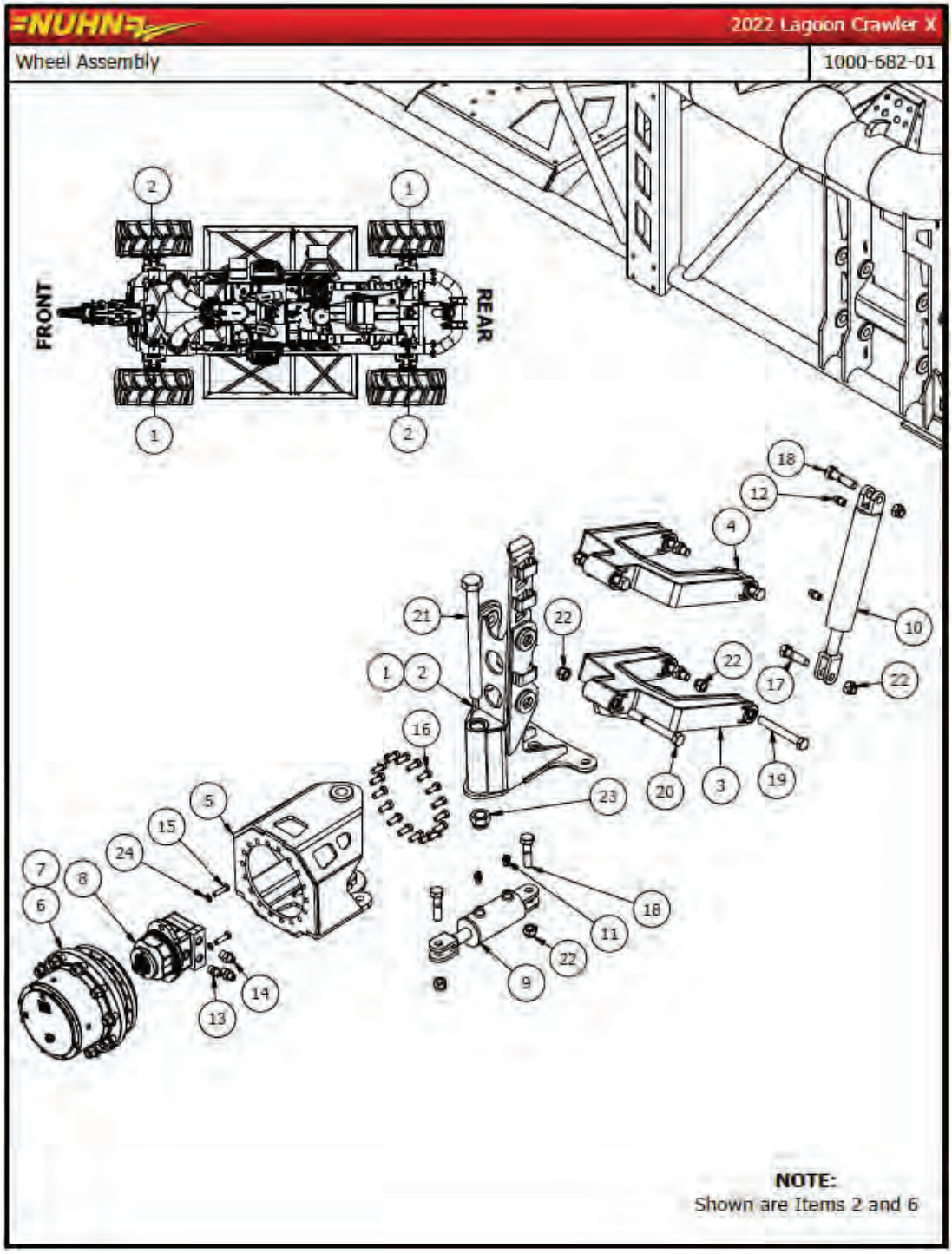
recited in Claim 1 of the '425 Patent.

iii. "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor;"

493. The Crawler X includes "a ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor." As shown below, the parts catalog for the Crawler X shows that it include four wheels and four hydraulic motors powering each wheel.

494. The four wheels and one of the hydraulic motors are shown in the parts catalogue for Nuhn's Crawler X:

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EX2047 at 40, NUHN15000007303 (*see* Items 6, 7).

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NUHN 2022 Lagoon Crawler X

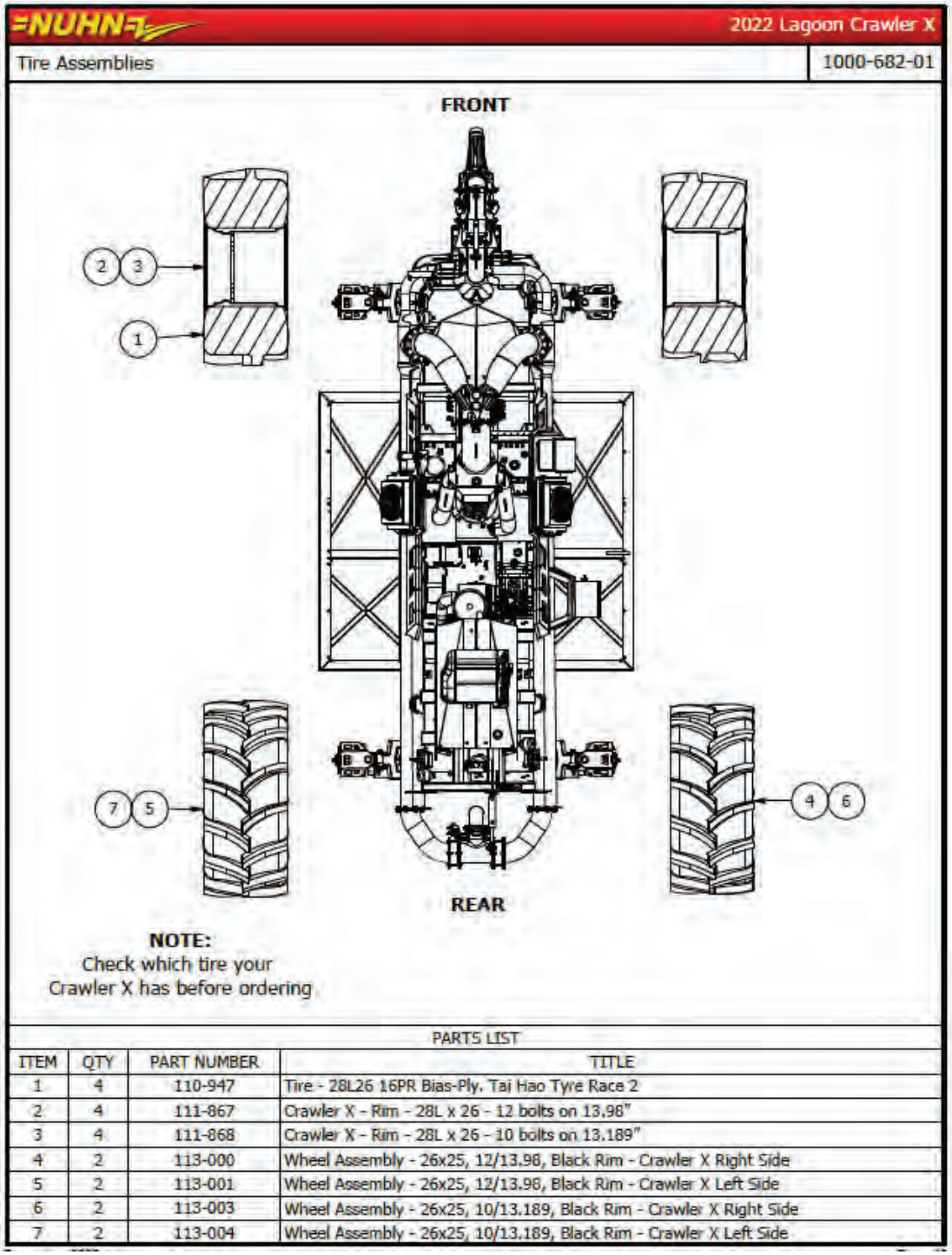
Wheel Assembly 1000-682-01

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	111-865	Crawler X - Wheel Drive Upright Bracket - Left side - Heavy
2	1	111-866	Crawler X - Wheel Drive Upright Bracket - Right side - Heavy
3	1	100-778-2	Crawler - A-Arm with Cylinder Mount (Lower) - Heavy Box Style
4	1	100-777-2	Crawler - A-Arm (Upper) - Heavy Box Style
5	1	111-864	Crawler X - Universal Wheel Drive Hub Mount - 18 Bolts on 11.811"
6	1	110-824	Crawler X - Wheel Drive Motor - Comer - 10 Bolt
7	1	110-816	Crawler X - Wheel Drive Motor - Bonfiglioli - 12 Bolt
8	1	111-644	Hydraulic - Piston Motor, Fixed Displacement 58cc - MAPWTT58SH4
9	1	110-802	Hyd. Cylinder - Welded - 3.5" x 4" - Clevis - Parallel - Rephasing
10	1	103-274	Hyd. Cylinder - Welded - 3" x 12" - Adj. Clevis - Parallel
11	2	104-455	Hyd. Adaptor - Straight - #4 MORS x #8 MOR (FS6400-04-08)
12	2	104-803	Hyd. Adaptor - Straight - #6 MORS x #8 MOR (FS6400-06-08)
13	1	104-460	Hyd. Adaptor - Straight - #10 MORS x #10 MOR (FS6400-10-10)
14	2	105-648	Hyd. Adaptor - Straight - #8 MORS x #12 MOR (FS6400-08-12)
15	2	111-264	Bolt - Hex Head - 0.5625" x 2" GR8
16	18	102-997	Bolt - Hex Head - M16 x 40 - 8.8
17	1	100-920	Bolt - Hex Head - 1" x 3.5" - GR5
18	3	100-467	Bolt - Hex Head - 1" x 4" - GR5
19	4	104-008	Bolt - Hex Head - 1" x 7.5" - GR8
20	2	104-295	Bolt - Hex Head - 1" x 8.5" - GR8
21	1	111-145	Bolt - Hex Head - 1.5"-6 x 18" GR8
22	10	100-907	Nut - Nylock - 1" - GR2
23	1	103-538	Nut - Nylock - 1.5" - GR2
24	2	112-304	Washer - Lock - 0.5625" - Medium Split

EX2047 at 41, NUHN15000007304 (*see* Items 6, 7 – showing two options of hydraulic motors).

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	4	110-947	Tire - 28L26 16PR Bias-Ply, Tai Hao Tyre Race 2
2	4	111-867	Crawler X - Rim - 28L x 26 - 12 bolts on 13.98"
3	4	111-868	Crawler X - Rim - 28L x 26 - 10 bolts on 13.189"
4	2	113-000	Wheel Assembly - 26x25, 12/13.98, Black Rim - Crawler X Right Side
5	2	113-001	Wheel Assembly - 26x25, 12/13.98, Black Rim - Crawler X Left Side
6	2	113-003	Wheel Assembly - 26x25, 10/13.189, Black Rim - Crawler X Right Side
7	2	113-004	Wheel Assembly - 26x25, 10/13.189, Black Rim - Crawler X Left Side

EX2047 at 42, NUHN15000007305.

495. Thus it is my opinion that Nuhn's Crawler X has a "ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor" as

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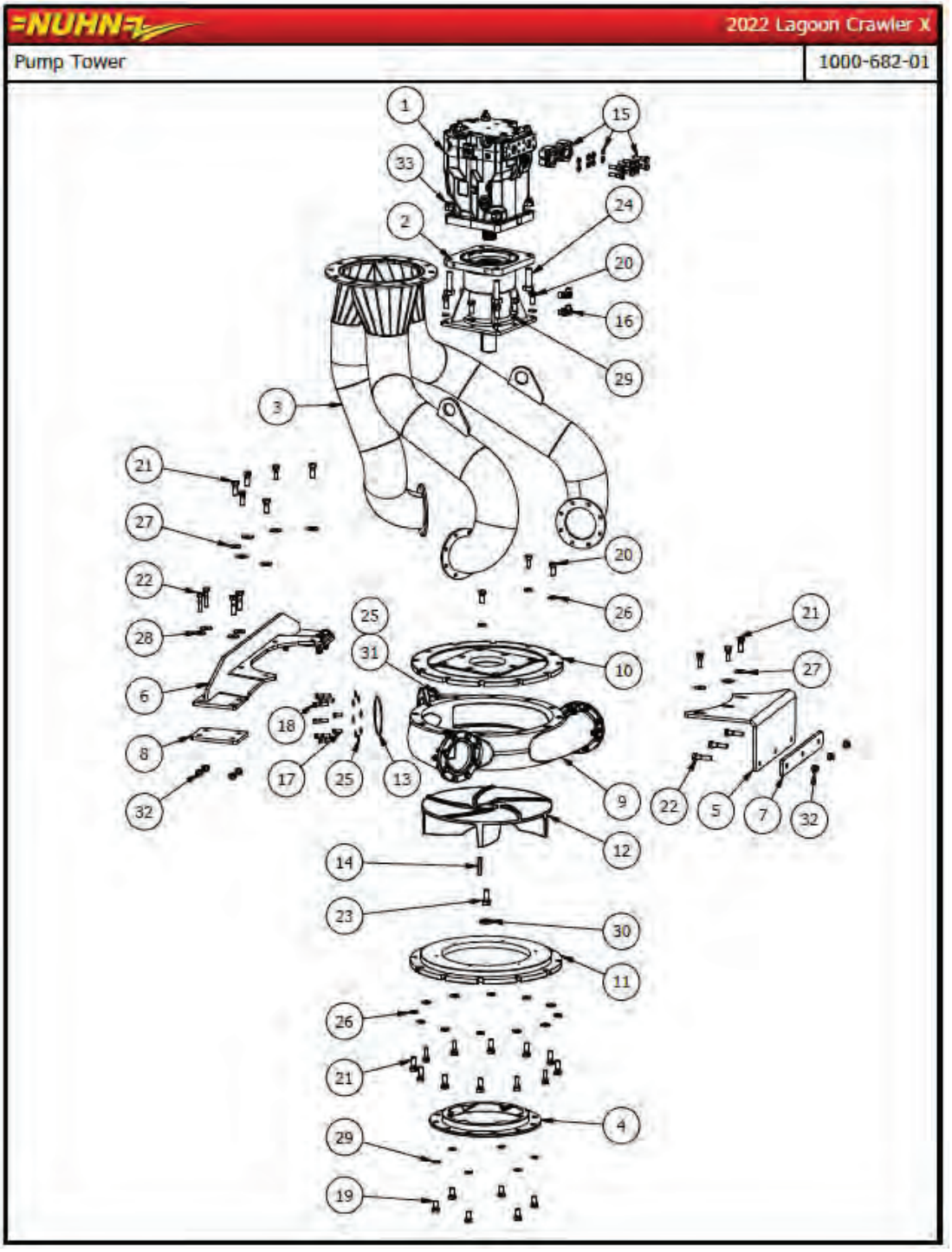
recited in Claim 1 of the '425 Patent.

iv. "a fluid pump for pumping liquid manure;"

496. Like the Gen 1 through Gen 3 Lagoon Crawlers before it, the Crawler X includes centrifugal pump with a semi-open impeller design that is specially designed for the harsh manure lagoons and pumping liquid manure therein.

497. The parts catalog for the Crawler X shows the various details of the pump module with a semi-open impeller (Item 12):

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EX2047 at 36, NUHN15000007299 (*see* Items 3, 4, 9, 10, 11, 12).

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NUHN — 2022 Lagoon Crawler X

Pump Tower			1000-682-01
PARTS LIST			
ITEM	QTY	PART NUMBER	TITLE
1	1	106-438	Hyd. Motor - HMV280 w/drive coupling, Mount SAE E, Shaft ANSI 33T 16/32dP
2	1	106-191	2.25" Mech. Seal Assembly - SAE E Mount - SAE F Spline 15T
3	1	111-880	Crawler X - Triple Port Header - 12" for 20.5" housing
4	1	107-550-1	20.5" Header Pump - Inlet Chopper - 12" ID - Flush Teeth
5	1	111-881-1	Crawler X - Front Pump Tower Housing Brace
6	1	111-882-1	Crawler X - Pump Tower - Top Housing Brace
7	1	110-656-1	Crawler - Pump Tower Belt - 3 Bolt - 2.5" x 18.75" x 0.5"
8	2	110-657-1	Crawler - Pump Tower Belt - 4 Bolt - 5.75" x 7.75" x 0.5"
9	1	105-228-1	20.5" Triple Port - Housing - 1A - Machined, 0.625" Bolts
10	1	105-229-1	20.5" Triple Port - Cast Top Cover - 1A - 0.625" bolts
11	1	106-792-1	20.5" Triple Port - Cast Inlet Cover - 14" ID with BC - 2A - 0.625" Bolts
12	1	111-415-1	20.5" Triple Port Pump - Cast Impeller with 2.25" Bushing - 5 Blade Flat Top
13	3	103-968	O-Ring - #359 DAE Buna - 6.125"OD x 5.75"ID
14	1	102-399 x 2.75"	Keystock - 0.5" x 0.5" x 2.75"
15	1	105-922	Hyd. Adaptor - #20 Split Flange Kit (Code 62) 1902-20
16	2	104-806	Hyd. Adaptor - 90° Elbow - #8 MORS x #8 MOR (FS6801-08-08)
17	6	109-940	Bolt - Hex Head - 0.4375" x 1" - GR8
18	18	109-921	Bolt - Hex Head - 0.4375" x 2" - GR8
19	6	104-427	Bolt - Hex Head - 0.625" x 1.25" - GR5
20	11	111-222	Bolt - Hex Head - 0.625" x 1.5" - GR8
21	21	105-487	Bolt - Hex Head - 0.625" x 1.75" - GR8
22	11	101-060	Bolt - Hex Head - 0.625" x 2.5" - GR5
23	1	109-229	Bolt - Hex Head - 0.75" x 1.75" - GR8
24	4	103-191	Bolt - Hex Head - 0.875" x 3" GR8
25	24	107-282	Washer - Flat - 0.4375" x 0.922" OD - GR8
26	15	112-996	Washer - 1.25" OD x 0.625" ID x 0.19" thk
27	9	104-863	Washer - Flat - 0.625" x 1.75" Zinc USS Thru-Hardened - Yellow
28	8	100-899	Washer - Flat - 0.625"
29	14	101-187	Washer - Lock - 0.625" - Medium Split
30	1	109-186	Plate - Weld On Hex Washer - 0.75"
31	18	106-117	Nut - Nylock - 0.4375" - GR8
32	11	100-905	Nut - Nylock - 0.625" - GR2
33	4	100-906	Nut - Nylock - 0.875" - GR2

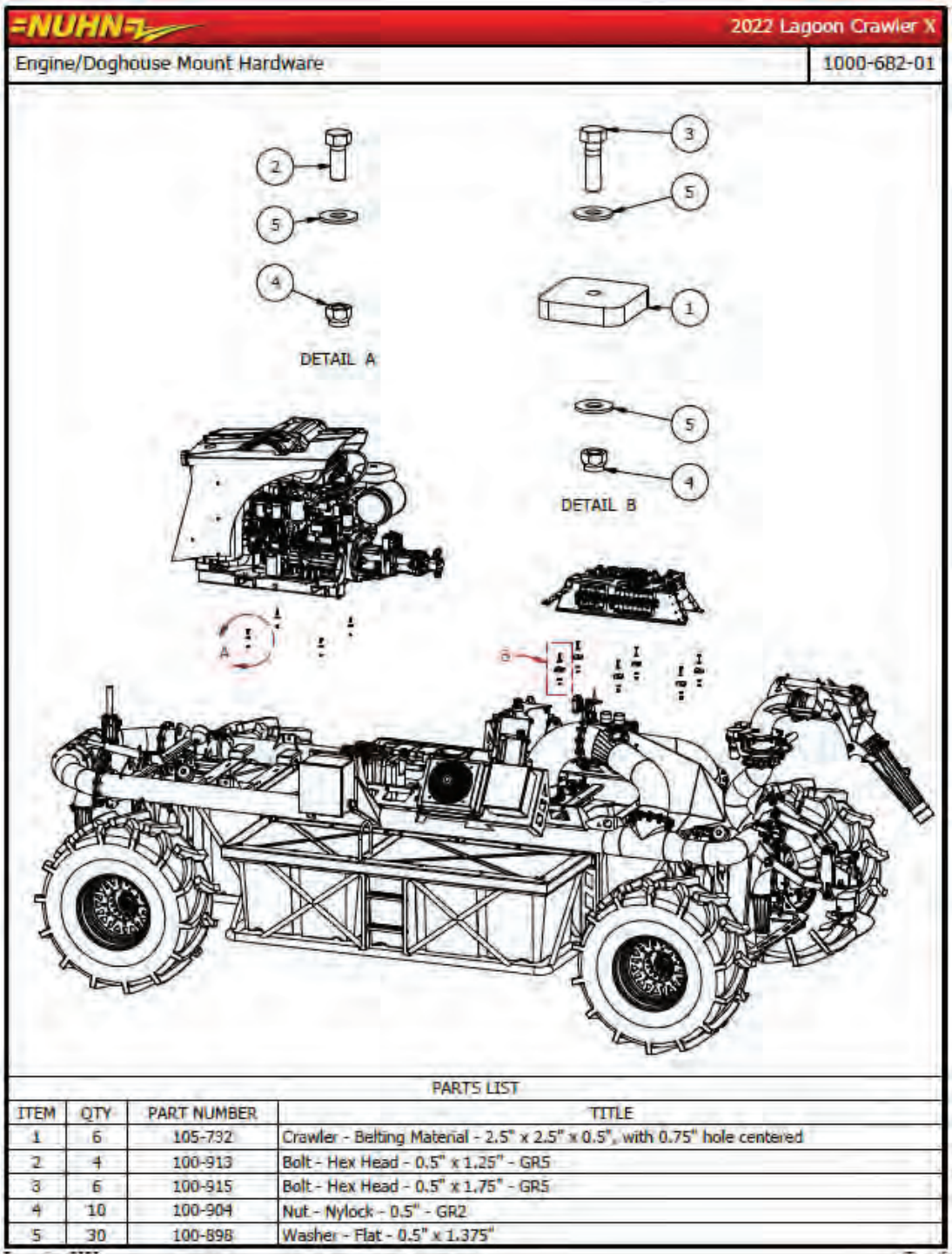
EX2047 at 37, NUHN15000007300 (*see* Items 3, 4, 9, 10, 11, 12).

498. Thus it is my opinion that Nuhn's Crawler X has "a fluid pump for pumping liquid manure" as recited in Claim 1 of the '425 Patent.

v. "a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump; and,"

499. The parts catalog for the Crawler X indicates that its power source is a CAT 7.1L engine:

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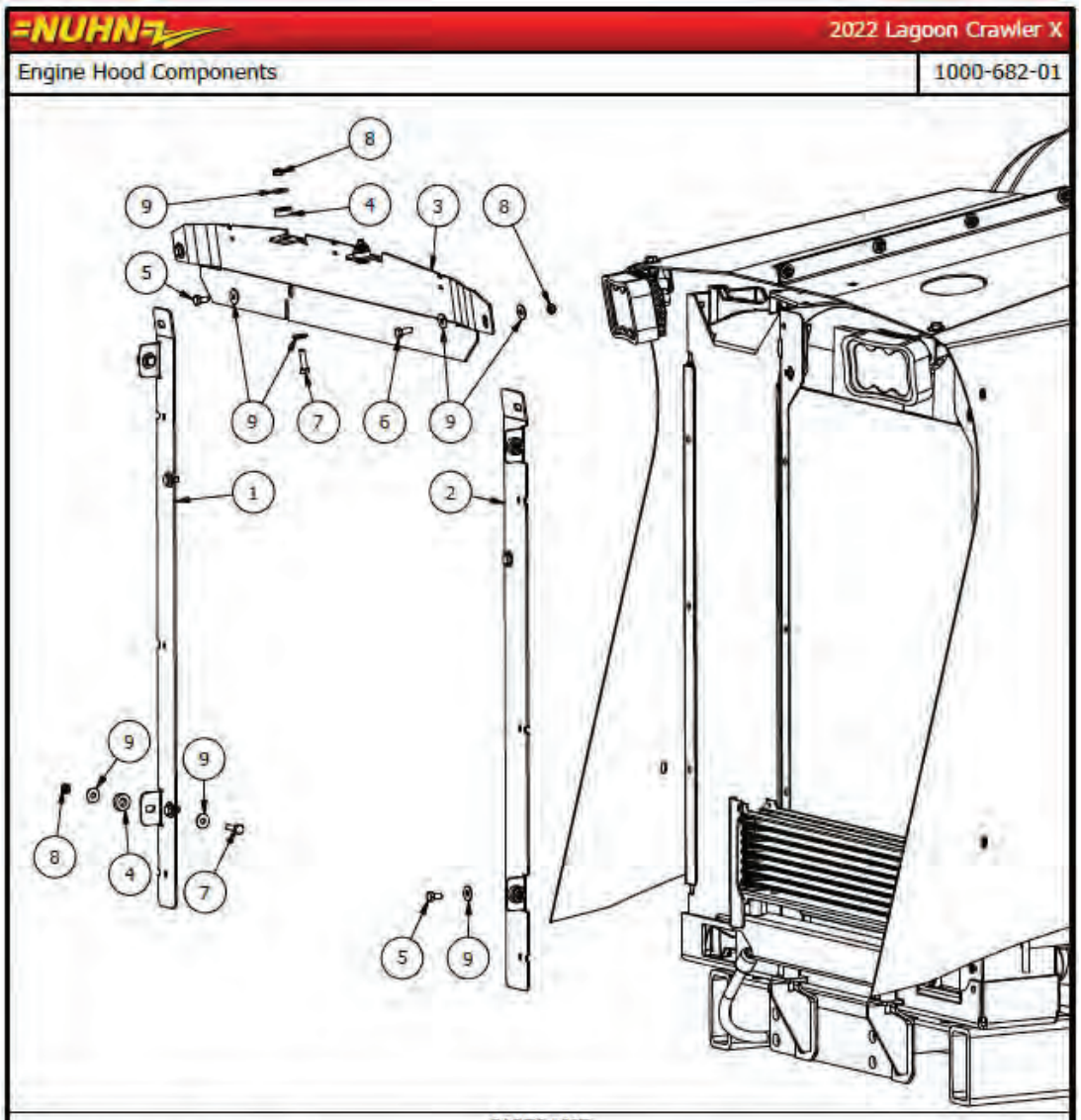


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	6	105-732	Crawler - Belting Material - 2.5" x 2.5" x 0.5", with 0.75" hole centered
2	4	100-913	Bolt - Hex Head - 0.5" x 1.25" - GR5
3	6	100-915	Bolt - Hex Head - 0.5" x 1.75" - GR5
4	10	100-904	Nut - Nylock - 0.5" - GR2
5	30	100-898	Washer - Flat - 0.5" x 1.375"

EX2047 at 6, NUHN15000007269.

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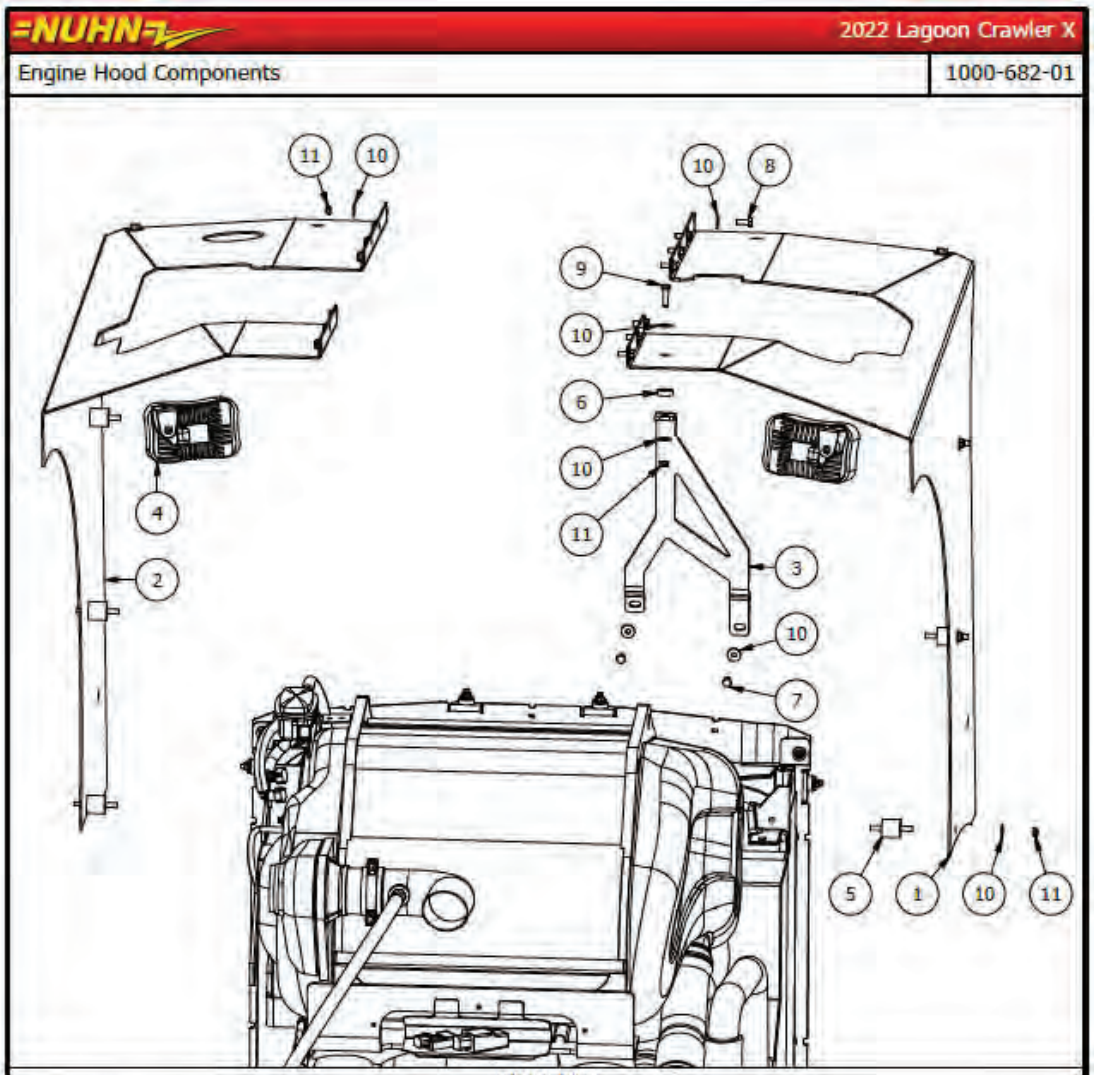


PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-835	CAT 7.1L Engine - Crawler - Left Engine Hood Stabilizer Tab - T4/S5
2	1	106-836	CAT 7.1L Engine - Crawler - Right Engine Hood Stabilizer Tab - T4/S5
3	1	106-837	CAT 7.1L Engine - Crawler - Rad Seal Top Plate - T4/S5
4	6	104-108	Rubber Washer - 1" OD x 0.5" ID x 0.3125" Thk
5	5	106-328	Bolt - Hex Head - M8 x 16 - 8.8
6	2	104-103	Bolt - Hex Head - M8 x 20 - 8.8
7	6	106-915	Bolt - Hex Head - M8 x 30 - 8.8
8	13	106-432	Nut - Nylock - M8
9	19	101-020	Washer - Flat - 0.3125"

EX2047 at 7, NUHN15000007270 (*see* Items 1, 2, 3 referring to hood components for CAT 7.1L engine).

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-545	CAT 7.1L Engine - Crawler - Left Hood - T4/S5
2	1	106-546	CAT 7.1L Engine - Crawler - Right Hood - T4/S5
3	1	106-914	CAT 7.1L Engine - Crawler - Rear Hood Brace - T4/S5
4	2	106-557-1	Work Light - Rectangular LED - 3200lm - with Bracket Kit
5	6	106-453	Rubber Hood Insulator - M8 x 1.25
6	1	104-108	Rubber Washer - 1" OD x 0.5" ID x 0.3125" Thk
7	2	106-328	Bolt - Hex Head - M8 x 16 - 8.8
8	7	104-103	Bolt - Hex Head - M8 x 20 - 8.8
9	1	106-915	Bolt - Hex Head - M8 x 30 - 8.8
10	24	101-020	Washer - Flat - 0.3125"
11	17	106-432	Nut - Nylock - M8

EX2047 at 8, NUHN15000007271 (*see* Items 1, 2, 3 referring to hood components for CAT 7.1L engine).

500. The power source of Nuhn's Crawler X is connected to at least two hydraulic

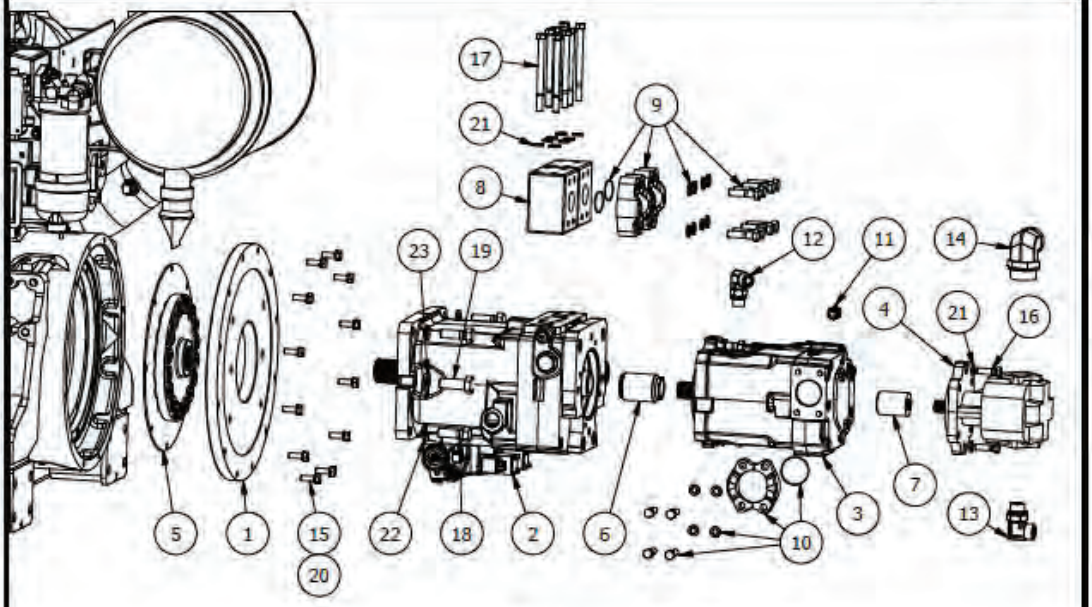
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pumps (Items 2 and 3). It is my understanding that the first hydraulic pump (HPV165, Item 2) is connected to and directly driven by the engine. It is also my understanding that the second hydraulic pump (HPR105, Item 3) is connected to and directly driven by the first hydraulic pump (Item 2). It is my understanding that the first hydraulic pump (Item 2) is hydraulically connected to the fluid pump for pumping liquid manure on the Crawler X, and that the second hydraulic pump (Item 3) is hydraulically connected to the four hydraulic wheel motors on the Crawler X. That is, I understand that when the first hydraulic pump is powered by the engine, it pressurizes hydraulic fluid, which can be used to power the fluid pump for pumping liquid manure, and when the second hydraulic pump is powered by the engine, it pressurizes hydraulic fluid, which can be used to power the four hydraulic wheel motors. Thus, the power source is configured to provide power to the ground engaging propulsion structure. These two hydraulic pumps are shown in the parts catalog of Nuhn's Crawler X:

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NUHN — 2022 Lagoon Crawler X

Engine Components — 1000-682-01



PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	108-126	Hyd. Pump Mount Plate - SAE #3 Housing to SAE D 2 Bolt (and Linde 4 Bolt) Pump
2	1	110-666	Hyd. Pump - HPV165 - SAE D 2 Bolt, SAE D 13T Shaft
3	1	110-667-1	Hyd. Pump - HPR105 - SAE C 2-Bolt, SAE C 14T Shaft
4	1	111-116	Crawler - Hydraulic - Multiple Pump - KP30.51D0-04Z3-LOG/OF-N
5	1	111-486	Flywheel Coupling Assembly - 11.5" Flywheel to SAE D 13 Tooth 8/16 Spline – 450HP
6	1	109-975	Hyd. Coupling - Through Drive - 22T Spline to SAE C, 14T Spline - 3" L x 2" OD
7	1	111-439	Hyd. Coupling - Through Drive - 19T Spline to SAE B, 13T Spline - 2.25" L x 1.75" OD
8	2	110-333	Flange Block Elbow - Code 62-20 to Code 62-24
9	2	110-640	Hyd. Adaptor - #24 Split Flange Kit (Code 62)
10	1	107-228	Hyd. Adaptor - #32 Split Flange Kit (Code 61)
11	1	104-801	Hyd. Adaptor - Straight - #6 MORS x #6 MOR (FS6400-06-06)
12	1	106-478	Hyd. Adaptor - 90° Elbow - #10 MORS x #10 MOR (FS6801-10-10)
13	1	104-814	Hyd. Adaptor - 90° Elbow - #12 MORS x #12 MOR (FS6801-12-12)
14	1	107-233	Hyd. Adaptor - 90° Elbow - #24 MORS x #24 MOR (FS6801-24-24)
15	12	103-377	Bolt - Hex Head - M10 x 30 - 8.8
16	4	100-910	Bolt - Hex Head - 0.4375" x 1.5" - GR5
17	8	110-765	Bolt - Hex Head - 0.4375" x 5.5" - GR5
18	4	101-059	Bolt - Hex Head - 0.625" x 2" - GR5
19	2	101-206	Bolt - Hex Head - 0.75" x 2" - GR5
20	12	105-094	Washer - Lock - M10
21	14	101-186	Washer - Lock - 0.4375" - Medium Split
22	4	101-187	Washer - Lock - 0.625" - Medium Split
23	2	101-203	Washer - Lock - 0.75" - Medium Split

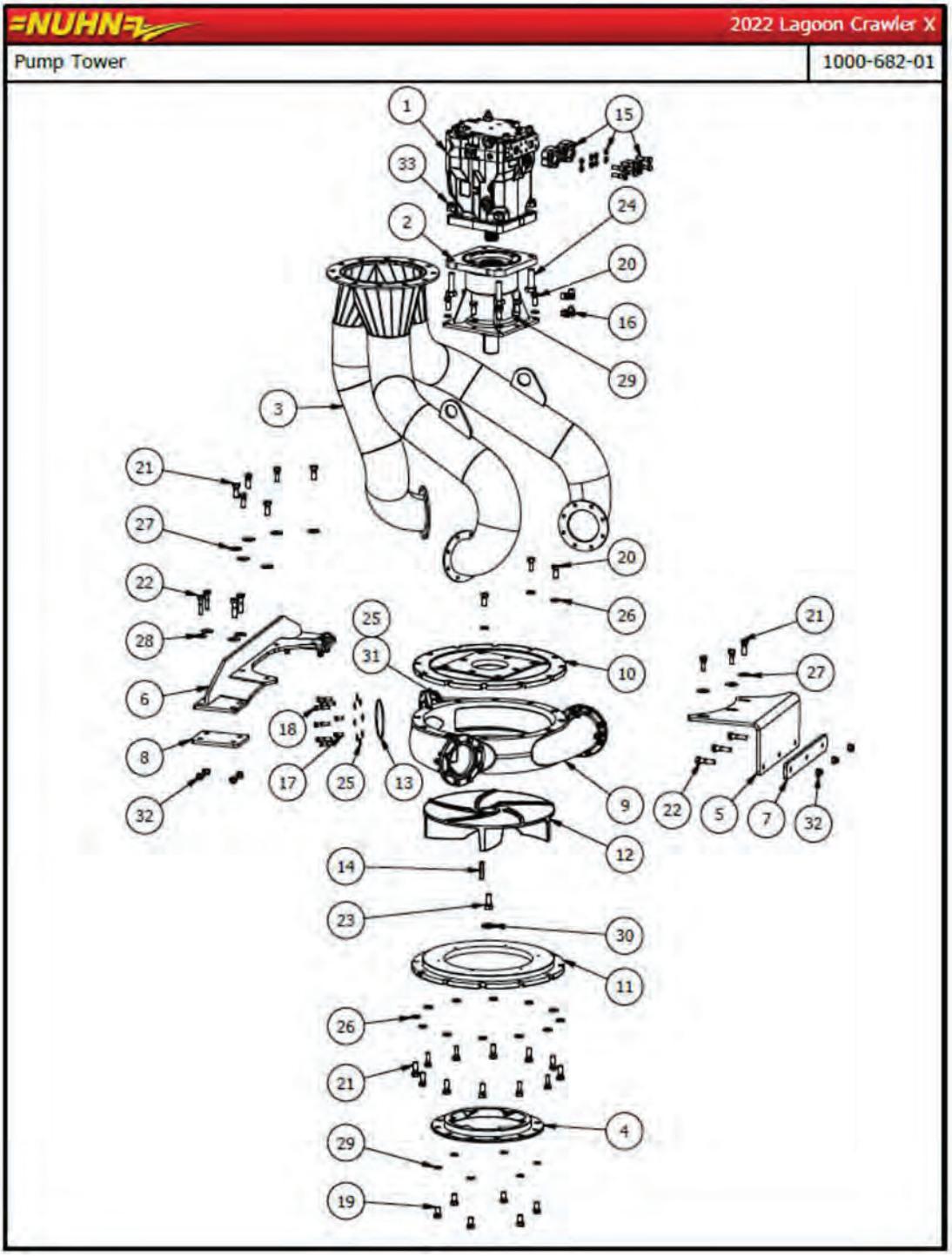
EX2047 at 9, NUHN15000007272 (*see* Items 2, 3).

501. As noted above, the power source is also configured to provide power to the fluid pump of Nuhn's Crawler X. As noted above, it is my understanding that the first hydraulic pump

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(Item 2 shown above) is hydraulically connected to and powers a hydraulic motor (HMV280, Item 1 shown below) that is connected to the fluid pump for pumping liquid manure. The hydraulic motor (Item 1) that is connected to the fluid pump for pumping liquid manure is shown in the parts catalog for the Crawler X:

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EX2047 at 36, NUHN15000007299 (see Item 1).

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NUHN — 2022 Lagoon Crawler X

Pump Tower — 1000-682-01

PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	106-438	Hyd. Motor - HMV280 w/drive coupling, Mount SAE E, Shaft ANSI 33T 16/32dP
2	1	106-191	2.25" Mech. Seal Assembly - SAE E Mount - SAE F Spline 15T
3	1	111-880	Crawler X - Triple Port Header - 12" for 20.5" housing
4	1	107-550-1	20.5" Header Pump - Inlet Chopper - 12" ID - Flush Teeth
5	1	111-881-1	Crawler X - Front Pump Tower Housing Brace
6	1	111-882-1	Crawler X - Pump Tower - Top Housing Brace
7	1	110-656-1	Crawler - Pump Tower Belt - 3 Bolt - 2.5" x 18.75" x 0.5"
8	2	110-657-1	Crawler - Pump Tower Belt - 4 Bolt - 5.75" x 7.75" x 0.5"
9	1	105-228-1	20.5" Triple Port - Housing - 1A - Machined, 0.625" Bolts
10	1	105-229-1	20.5" Triple Port - Cast Top Cover - 1A - 0.625" bolts
11	1	106-792-1	20.5" Triple Port - Cast Inlet Cover - 14" ID with BC - 2A - 0.625" Bolts
12	1	111-415-1	20.5" Triple Port Pump - Cast Impeller with 2.25" Bushing - 5 Blade Flat Top
13	3	103-968	O-Ring - #359 DAE Buna - 6.125"OD x 5.75"ID
14	1	102-399 x 2.75"	Keystock - 0.5" x 0.5" x 2.75"
15	1	105-922	Hyd. Adaptor - #20 Split Flange Kit (Code 62) 1902-20
16	2	104-806	Hyd. Adaptor - 90° Elbow - #8 MORS x #8 MOR (FS6801-08-08)
17	6	109-940	Bolt - Hex Head - 0.4375" x 1" - GR8
18	18	109-921	Bolt - Hex Head - 0.4375" x 2" - GR8
19	6	104-427	Bolt - Hex Head - 0.625" x 1.25" - GR5
20	11	111-222	Bolt - Hex Head - 0.625" x 1.5" - GR8
21	21	105-487	Bolt - Hex Head - 0.625" x 1.75" - GR8
22	11	101-060	Bolt - Hex Head - 0.625" x 2.5" - GR5
23	1	109-229	Bolt - Hex Head - 0.75" x 1.75" - GR8
24	4	103-191	Bolt - Hex Head - 0.875" x 3" GR8
25	24	107-282	Washer - Flat - 0.4375" x 0.922" OD - GR8
26	15	112-996	Washer - 1.25" OD x 0.625" ID x 0.19" thk
27	9	104-863	Washer - Flat - 0.625" x 1.75" Zinc USS Thru-Hardened - Yellow
28	8	100-899	Washer - Flat - 0.625"
29	14	101-187	Washer - Lock - 0.625" - Medium Split
30	1	109-186	Plate - Weld On Hex Washer - 0.75"
31	18	106-117	Nut - Nylock - 0.4375" - GR8
32	11	100-905	Nut - Nylock - 0.625" - GR2
33	4	100-906	Nut - Nylock - 0.875" - GR2

EX2047 at 37, NUHN15000007300 (*see* Item 1).

502. Thus it is my opinion that Nuhn's Crawler X has "a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump" as recited in Claim 1 of the '425 Patent.

vi. "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 fluid 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."

503. It is my understanding that the Crawler X includes a wireless remote control that is

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designed to control the Crawler X in substantially the same way that the wireless remote control system controls the Gen 3 Lagoon Crawler. Namely, like the Gen 3, all of the machine operations of the Crawler X are controlled through wireless remote control. As such, it is my opinion that the Crawler X includes a wireless remote control is 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 fluid 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.

504. The radio remote (Item 1) and the remote control receiver (Item 2) are shown in the parts catalog for Nuhn's Crawler X:

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PARTS LIST

ITEM	QTY	PART NUMBER	TITLE
1	1	109-212	Crawler - Radio Remote - Transmitter Only - No ID Key
2	1	110-561	Crawler - CRD Receiver Only - No ID Key
3	1	109-213	Crawler - Radio ID Key Set (TX and RX)
4	1	109-161	Crawler - Battery - LPM04-Li-ION
5	1	110-747	Crawler - Car Style Battery Charger Cable Only - DC Adapter
6	1	109-151	Crawler - Battery Charger and Car Style Cable - Combo
7	1	109-150	Crawler - Battery Charger and Wall Style Cable - Combo

EX2047 at 26, NUHN15000007289.

505. Thus it is my opinion that Nuhn's Crawler X has "a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging

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propulsion structure; (2) control a flow of liquid manure from the fluid 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" as recited in Claim 1 of the '425 Patent.

506. Therefore, in view of the above, it is my opinion that the claims of the '425 Patent cover Nuhn's Crawler X and that Nuhn's Crawler X is commensurate with the scope of the claims of the '425 Patent.

B. The Patented Invention Satisfied a Long Felt But Unsolved Need

507. The '425 Patent itself describes the long felt, but unsolved need that was in the industry. Namely, with larger manure lagoons becoming increasingly more common, the liquid manure pumps that were located on the edges of the manure lagoon were limited in their ability to sufficiently break up the crust and recirculate the liquid manure.

508. Specifically, the '425 Patent describes that during storage of liquid manure "a crust can develop on the surface of the pit or lagoon that must be disrupted prior to or during removal of the manure." EX1001, '425 Patent at col. 1, ln.36-38. It goes on to describe that "[p]umps are employed for this purpose with jets that return a percentage of the manure back to the pit or lagoon in the form of a high volume spray to disrupt the crust and recirculate the manure." *Id*. at col. 1, ln. 38-41. Acknowledging that "[p]umps for use in recirculating manure from ***smaller*** pits are known" (*id*. at col. 1, ln. 41-42 (emphasis added)), it recognized that there were long-standing problems with these pumps. Namely, "these pumps are typically suitable for accessing the pit or lagoon from its edge and are connected to a tractor or similar land vehicle for operational power." *Id*. at col. 1, ln. 43-45. Because such pumps are only at the edge of the pit or lagoon, "[t]hey are therefore limited in their ability to recirculate manure to the middle of ***large*** lagoons, which are becoming increasing common as the size of animal husbandry operations increases." *Id*. at col. 1, ln. 45-49 (emphasis added). The '425 Patent therefore identifies that "there is a need for improved pumps and vehicles equipped for pumping, particularly pumps and vehicles suitable for use with

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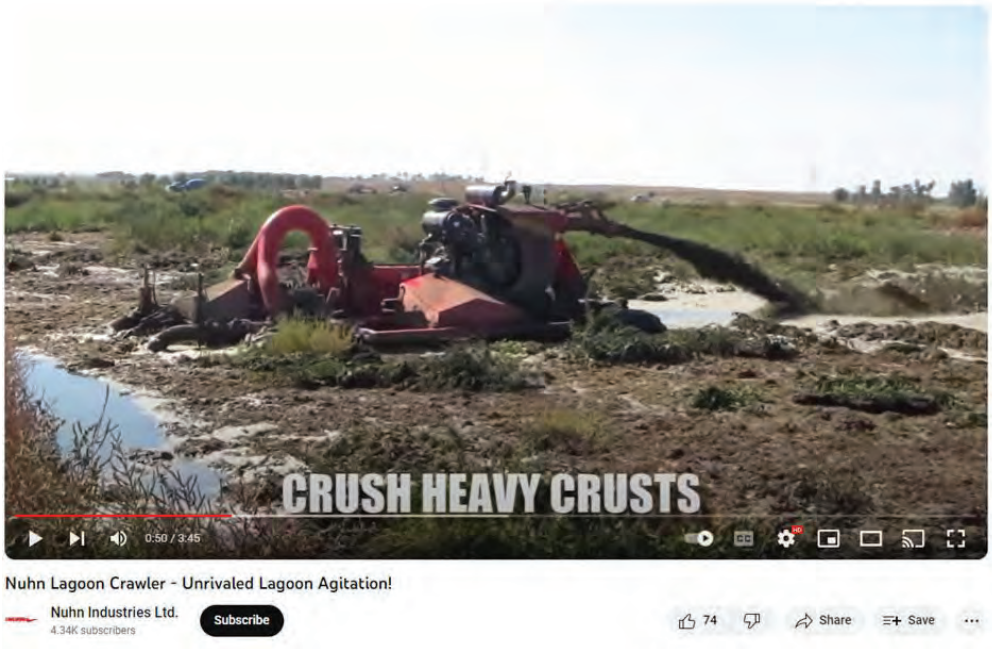
large manure lagoons." *Id*. at col. 1, ln. 50-52. The invention described in the '425 Patent met that need head on.

509. That the invention patented in the '425 Patent solved this long felt, but unsolved need is evidence that the claims of the '425 Patent would not have been obvious to a POSITA.

C. The Claimed Amphibious Vehicle Achieved Unexpected Results

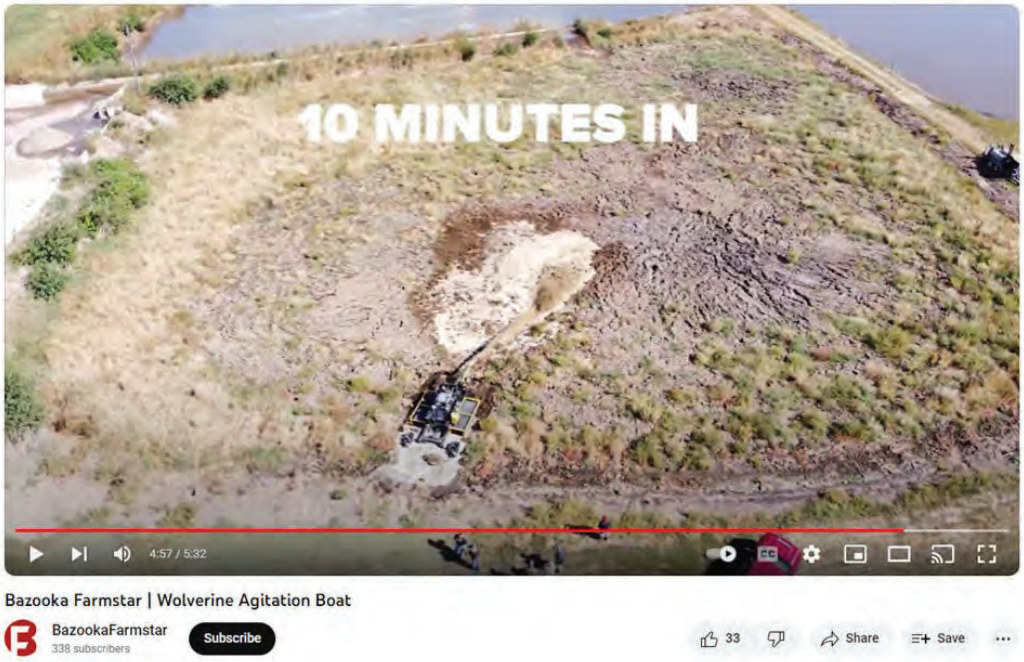
510. It is my understanding that unexpected results achieved by the claimed invention can be additional evidence that a patented invention is not obvious.

511. Here, the amphibious vehicle described and claimed in the '425 Patent is able to drive into and out of a manure lagoon. And when driving into the manure lagoon, the combined action of the moving wheels and the displacement of the floatable vehicle body helps to break up the hard, thick crust. As shown below, both Patent Owner's Lagoon Crawler and Petitioner's Wolverine Agitation Boat create a pocket or opening in the crust that aids in the breaking up and agitation of the crust and liquid manure:



EX2006 at 2.

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EX2007, p. 3.

512. A POSITA may have expected the incorporation of powered wheels onto an agitation boat would have assisted in moving an agitation boat to and from a manure lagoon. However, it is my opinion that a POSITA would not have expected the powered wheels to provide the ability for the agitation boat to chew a hole into the thick crust of poorly managed manure lagoons, or that the wheels would have helped to move the vehicle around and off of—as well as break up—any shallow areas in the lagoon formed by built up sludge. Thus, it is my opinion the wheels of the amphibious vehicle described and claimed in the '425 Patent provided these new and unexpected results. It is my opinion these new capabilities provided the ability for the amphibious vehicle described and claimed in the '425 Patent to agitate manure lagoons that were poorly served by an agitation boat like Puck's.

513. The ability to remotely control the amphibious vehicle described and claimed in the '425 Patent while it is on land and floating in the manure lagoon, as well as the ability to remotely control the flow of liquid manure from the fluid pump, allowed it to move through the manure lagoon even in areas of thick crust and shallow areas where sludge had built up to agitate and break

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up the crust like no other vehicle before it. Simply, the amphibious vehicle described and claimed in the '425 Patent is able to act like an icebreaker, breaking through and breaking up all portions of a manure lagoon, especially large manure lagoons that were unable to be agitated by prior edge-based agitation pumps or Puck's agitation boat.

D. Copying of the Patented Invention by Others

514. It is my understanding that copying by others can be additional evidence that a patented invention is not obvious.

515. As described above, on October 2, 2023, I personally accessed and viewed a video that Nuhn posted to its YouTube channel showcasing Nuhn's Lagoon Crawler, which is posted on YouTube at the following link: https://www.youtube.com/watch?v=fEgvvq9HZkk. Additionally, as described above on October 2, 2023, I took screenshots from this video of Nuhn's Lagoon Crawler and compiled them as EX2006. As described above, on October 2, 2023, I also personally accessed and viewed a video that Bazooka posted to its YouTube channel showcasing Bazooka's Wolverine Agitation Boat, which is posted on YouTube at the following link: https://www.youtube.com/watch?v=3y3bSJJUOps. Also, as described above, on October 2, 2023, I took screenshots from this video of Bazooka's Wolverine Agitation Boat and compiled them as EX2007. Nuhn's video shows its Lagoon Crawler driving on four wheels into and out of manure lagoons [EX2006 at 5, 6, 8], moving in the manure lagoons [EX2006 at 1], and disrupting and pumping the crusts in the liquid manure using its submerged fluid pump [EX2006 at 2, 3, 6, 7]. Bazooka's video shows its Wolverine Agitation Boat driving on four wheels into and out of manure lagoons [EX2007 at 1], moving in the manure lagoons [EX2007 at 2], and disrupting and pumping the crusts in the liquid manure using its submerged fluid pump [EX2007 at 3-6].

516. As noted above, on March 20, 2024, I personally accessed and viewed Bazooka's webpage for its Wolverine Agitation Boat at: https://www.bazookafarmstar.com/equipment/wolverine-agitation-boat/. On March 30, 2024, I printed this webpage and it is referenced herein as EX2031. Also as noted above, on March 20,

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2024, I also personally downloaded Bazooka's brochure for the Bazooka Wolverine Agitation Boat from: https://www.bazookafarmstar.com/wp-content/uploads/2023/01/Cutsheet-Wolverine-1.pdf. On March 30, 2024, I saved that brochure and it is referenced herein as EX2032.

517. Bazooka's website and brochure show its Wolverine Agitation Boat as being an amphibious vehicle that can drive into and out of a manure lagoon, as well as float in a manure lagoon:



EX2031 at 3



EX2032 at 1

518. Bazooka's brochure also shows and describes that its Wolverine Agitation Boat includes four, hydraulically-powered wheels, just like Nuhn's Lagoon Crawlers:

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A RUGGED, LOW-COST SOLUTION

The Wolverine agitation boat was designed with durability, efficiency and ease of maintenance at the forefront. With zero gate valves, no mechanical seals and only eight hydraulic cylinders, the streamlined design simplifies the maintenance and cleaning process, saving you time and money.

UNMATCHED CLIMBING ABILITY

The high-torque drive system that complements the sheer size of its aggressive tires produces climbing ability that can't be matched. This is also thanks to the traction control system that ensures equal flow to each wheel.

EX2032 at 1.

SPECIFICATIONS

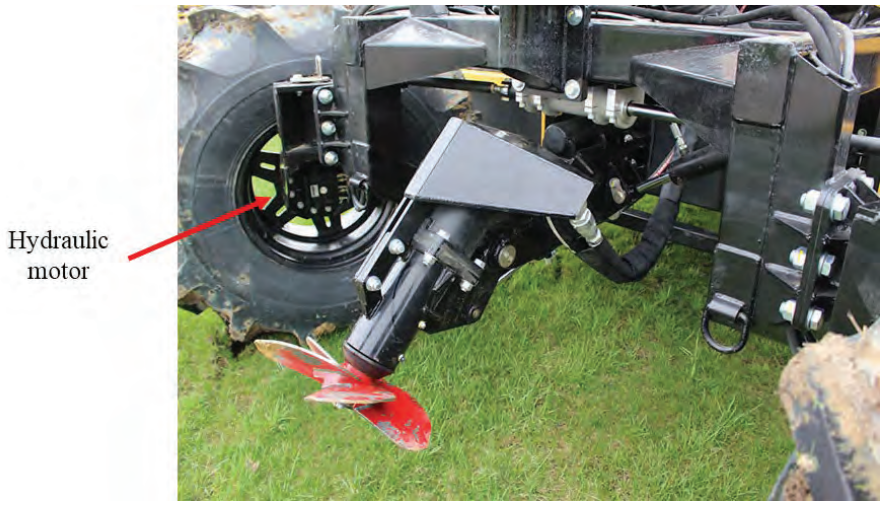
STANDARD

- Length – 21' 4"
- Width – 11' 3"
- Height – 11'
- 13' tall loaded on the Bazooka Farmstar-made Wolverine trailer
- Weight – 15,750 lbs. [filled w/ fuel and liquids] (Dependent on engine options)
- [4] Rice tires, 23.1-26, 12 ply [68" DIA x 24" wide]
- 4-wheel steering
- High-torque planetary wheel drives – Freewheel capable
- Double-acting steering cylinders
- 18" White Iron Bazooka Submersible Pump
- Cummins 6.7 L, 310 HP, Tier 4 Final Engine
- 150-gallon steel fuel tank with an innovative baffle system
- [2] 20" diameter, Hardox 500 TUF steel, 5-bladed ragless propellers
- Custom-made prop bearing housing with hardened, nickel-plated 2.25" DIA shaft
- Gear oil bath with a quadruple lip seal arrangement
- Dual hydrostat Linde piston pumps

EX2032 at 2.

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519. As shown in this photo from Bazooka's website, the wheels are powered by hydraulic motors:



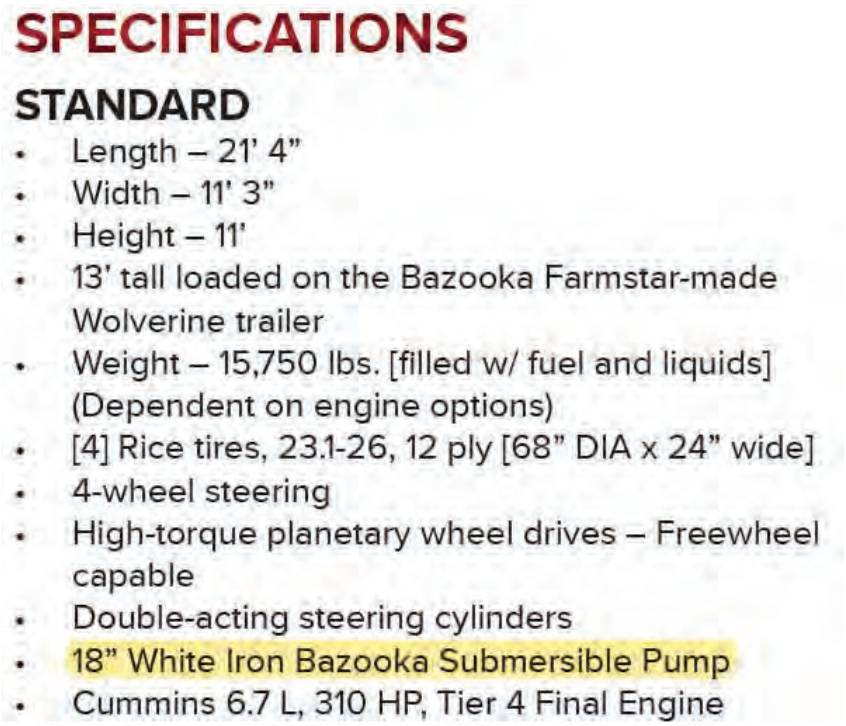
EX2031 at 9.

520. Bazooka also states that its Wolverine Agitation Boat includes a fluid pump for pumping liquid manure, specifically, an 18" submersible pump:

> The 18" Bazooka Farmstar submersible pump features a Hardox 500 Tuff housing and impeller.
>
> BONUS: the pump and propellers are reversible to keep foreign objects from shutting you down. Equipped with a 5" diameter front gun that's steerable side-to-side and up and down. The hose outlet can face directly downward and be slightly submerged in the manure to aid in agitation, or it can be directed upward at a 15-degree angle for bank washing.
>
> Since all Bazooka Farmstar agitation equipment and power units utilize a BF submersible pump, you can bet you'll always be supported by our dealer network and ready to work.

EX2031 at 14.

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SPECIFICATIONS

STANDARD

- Length – 21' 4"
- Width – 11' 3"
- Height – 11'
- 13' tall loaded on the Bazooka Farmstar-made Wolverine trailer
- Weight – 15,750 lbs. [filled w/ fuel and liquids] (Dependent on engine options)
- [4] Rice tires, 23.1-26, 12 ply [68" DIA x 24" wide]
- 4-wheel steering
- High-torque planetary wheel drives – Freewheel capable
- Double-acting steering cylinders
- 18" White Iron Bazooka Submersible Pump
- Cummins 6.7 L, 310 HP, Tier 4 Final Engine

EX2032 at 2.

521. Bazooka also includes a power source, which is a Cummins 6.7L, 310 hp Tier 4 Final Engine as standard, with optional upgrades to a CAT 7.1L, 310 hp, Tier 4 engine, a CAT 9L, 455 hp Tier 4 engine, or a John Deere 6.8L, 300 hp, Tier 4 engine:

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SPECIFICATIONS

STANDARD

- Length – 21' 4"
- Width – 11' 3"
- Height – 11'
- 13' tall loaded on the Bazooka Farmstar-made Wolverine trailer
- Weight – 15,750 lbs. [filled w/ fuel and liquids] (Dependent on engine options)
- [4] Rice tires, 23.1-26, 12 ply [68" DIA x 24" wide]
- 4-wheel steering
- High-torque planetary wheel drives – Freewheel capable
- Double-acting steering cylinders
- 18" White Iron Bazooka Submersible Pump
- Cummins 6.7 L, 310 HP, Tier 4 Final Engine

EX2032 at 2.

UPGRADES

- CAT 7.1L Engine I310 HP I Tier 4
- CAT 9L Engine I 455 HP I Tier 4
- John Deere 6.8L I 300HP I Tier 4
- Lift Kit: Spreader bar, Lifting slings, Bolt-on lifting lugs, Anchor shackles, U-bolts

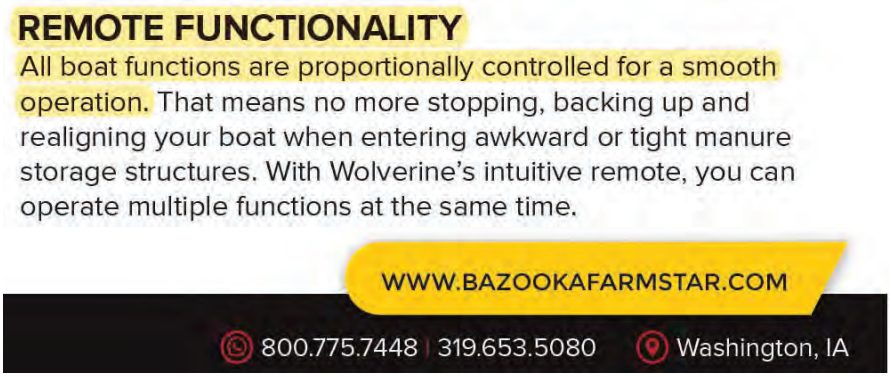
EX2032 at 2.

522. Additionally, based on my review of the Bazooka website for the Wolverine Agitation Boat [EX2031] and Bazooka's brochure for the Wolverine Agitation Boat [EX2032], it is my understanding the power source provides power to both the hydraulic wheel motors and the fluid pump for pumping liquid manure. Specifically, the brochure describes that the Wolverine Agitation Boat delivers "equal flow to each wheel" and that "[a]ll boat functions are proportionally controlled." EX2032 at 1. This indicates that each wheel is powered by the flow of hydraulic fluid (i.e., hydraulically powered). Additionally, in context with the description of "dual hydrostat Linde piston pumps" [EX2032 at 2], the reference to all boat functions being "proportionally controlled" indicates that all functions, including operating the fluid pump for pumping liquid manure, are

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operated with proportional hydraulic control. Proportional hydraulic control provides variable hydraulic output as well as very accurate control of pressure and flow.

523. Finally, Bazooka indicates that its Wolverine Agitation Boat is controlled by wireless remote control. Specifically, Bazooka's brochure states under the heading "Remote Functionality" that "[a]ll boat functions are proportionally controlled for a smooth operation":



EX2032 at 1. Bazooka's brochure indicates that the remote control is a "Dual-battery, Eaton Omnex remote control" and shows a user remotely controlling a Wolverine Agitation Boat:

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EX2032 at 2.

524. Bazooka's website for the Wolverine Agitation Boat describes that it includes "Precision Steering" and that a user can "[t]urn tight corners and easily manure your boat on the ground using multiple steering functions . . . by utilizing crab, front and rear steer." EX2031 at 7. It also describes control and maneuverability of the Wolverine Agitation Boat while it is in the liquid manure:

> Always in control. Always agitating. The propeller-based design of this agitation solution provides extreme agility, maneuverability, and a high level of control, never at the expense of agitation. Easily side-shift perpendicular to a bank while using the front gun to break up solid buildup while also using the propellers to move manure below the surface.

EX2031 at 8.

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> Dual propellers are the secret sauce to moving large volumes of liquid manure and having extreme control over your agitation boat. Our ragless, high-speed propellers can move a whopping 24,000+ GPM every minute you agitate. (Yes...you read that right.)
>
> The propellers create 4,000 pounds of thrust for agitation and maneuvering functions directly below the boat, establishing a solid center of gravity for stability. That means this well-balanced machine can move in any direction, even in the thickest sludge where most pumps cannot operate.
>
> BONUS: The propeller positions are adjustable and programmable, which means they will return to the 'trimmed' location when the joystick is released. Propellers are protected between the tires during operation. This prevents damage to the machine, manure storage structures and lined lagoons.

EX2031 at 9. Bazooka's website for the Wolverine Agitation Boat reiterates that all of these functions and abilities are remotely controlled:

> The Wolverine agitation boat is operated by an Eaton Omnex remote. The iconic dual propellers are controlled by smart cylinders, which means they not only stay synchronized, but they react quickly and precisely to the operator's inputs, making the boat extremely responsive and intuitive.
>
> All boat functions are proportionally controlled for a smooth operation. That means no more stopping, backing up and realigning your boat when entering awkward or tight manure storage structures. With Wolverine's intuitive remote, you can operate multiple functions at the same time. That is what we believe is called a "mic drop" statement.
>
> You can also keep an eye on the machine's vital functions with a simple interface that also displays warnings and codes.

EX2031 at 11.

525. Placed side-by-side, the similarities are striking:

Nuhn's Lagoon Crawler	Bazooka's Wolverine Agitation Boat
 **EX2043, NUHN15000007242**	 **EX2031 at 17**

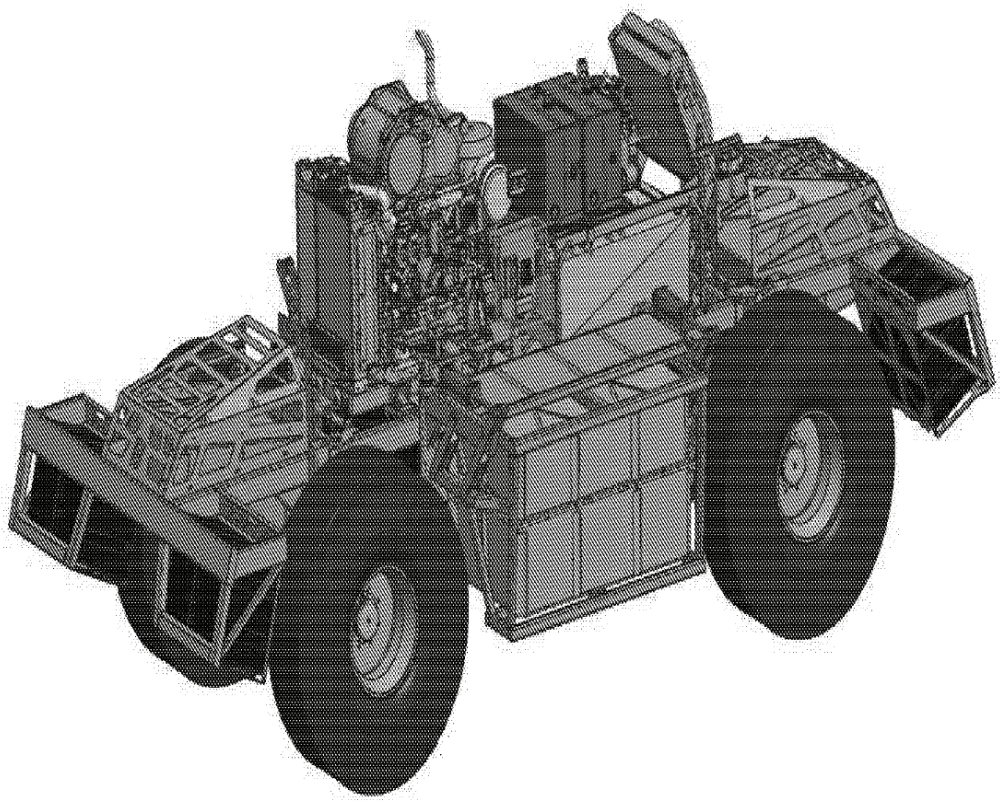
526. All of this shows copying by Bazooka.

527. As further evidence of copying, Petitioner filed two provisional patent applications

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each titled "Amphibious Agitation Machine." The first provisional patent application was filed on June 18, 2020 and was given serial number 63/040,562 ("the '562 Provisional"). EX2048. The second provisional application was filed on October 23, 2020 and was given serial number 63/104,887 ("the '887 Provisional"). EX2049. Then on June 18, 2021, Petitioner filed a non-provisional patent application, which was given serial number 17/351,841 ('the '841 Application"). EX2050 (published as US2021/0394571 on December 23, 2021).

528. Figure 1 of the '562 Provisional shows an "Amphibious Agitation Machine":



EX2048 at 16, '562 Provisional, Fig. 1. The Background of Petitioner's '562 Provisional describes that there are shortcomings with "existing units [that] use submerged centrifugal pumps driven from an engine/gearbox drivetrain," with the "main problem of this type of solution is the wear and tear (and thus reliability) of the unit since every gallon used for power and mixing has to flow through a single pump. Use of very high velocity and, in some solutions, high pressures to do this, which is cause for excess and premature wear when pumping hard sand mixtures." EX2048 at 28

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(¶ [0003]). Lacking a fluid pump for pumping liquid manure and an articulating nozzle/gun, the '562 Provisional describes the use of only propellers—a front pair of propellers and a rear pair of propellers—for agitation:

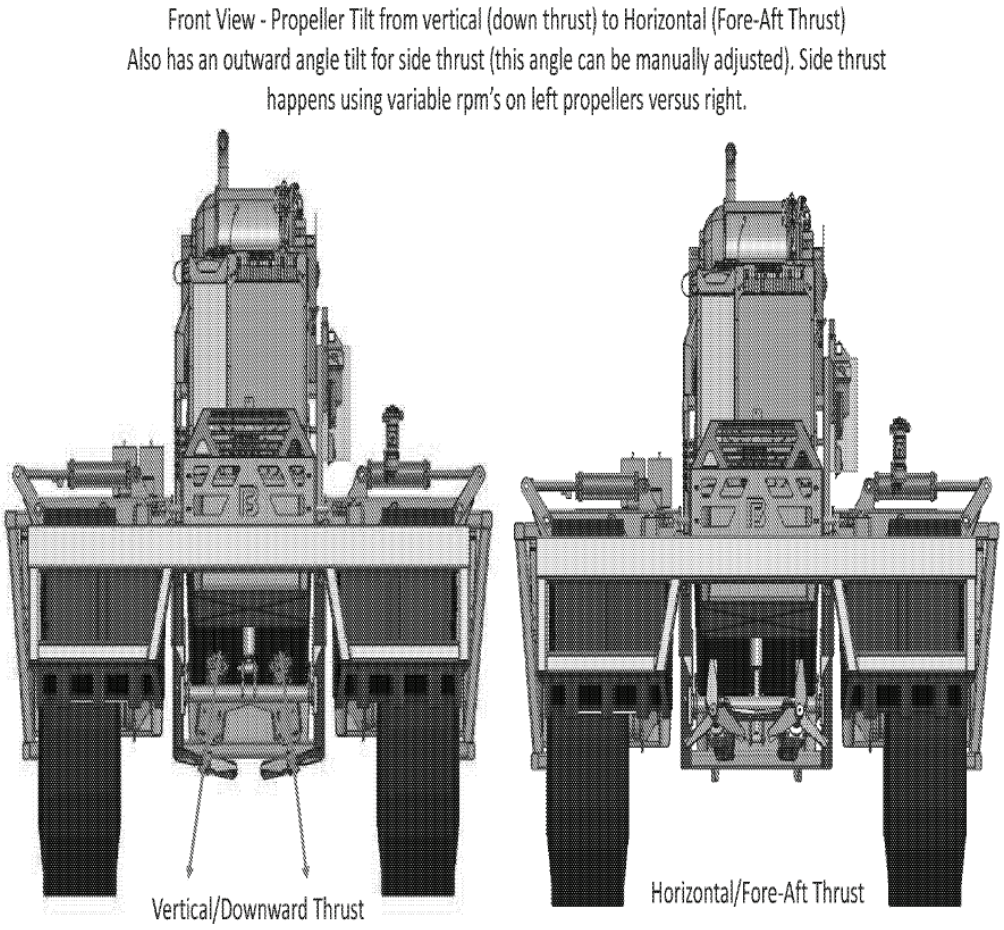


Figure 3A Figure 3B

EX2048 at 18 (Figs. 3A, 3B); *id*. at 30 (¶ [0016]); *id*. at 31 (¶ [0023]).

529. Four months later, when Petitioner filed its '887 Provisional, Petitioner included an embodiment that only included a front propeller and a rear propeller. Moving closer to Nuhn's Lagoon Crawler and the '425 Patent, this embodiment also added a fluid pump for pumping liquid manure:

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One problem we've solved is when aiming the nozzle/gun, the machine tends to float in a direction opposite the direction of flow from the nozzle. Since our propellers (which drive/steer the boat) and nozzle to spray are from different power sources, we can keep the machine in a stable position by countering the nozzle force with our propeller force. The competition steals flow from the pump/nozzle flow to redirect it for steering the machine, which doesn't work well since it's varying flow/thrust in an unpredictable manner. The forces change constantly and it's nearly impossible to keep the machine in position when using the front nozzle.

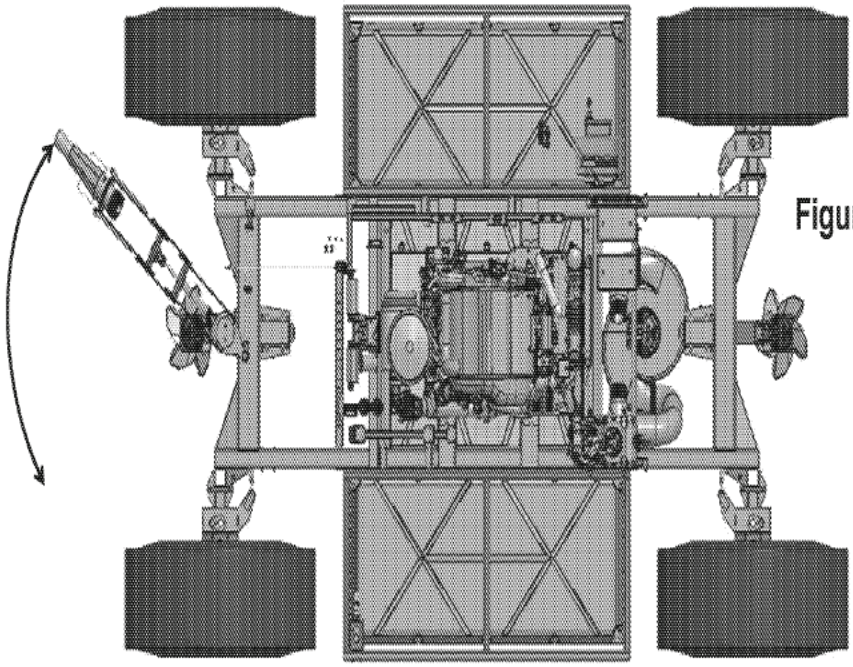


Figure 14

EX2049 at 38, '887 Provisional, Fig. 14.

530. Then in the '841 Application, Petitioner showed and described an "Amphibious Vehicle" that is substantially similar to its own Wolverine Agitation Boat and Nuhn's Lagoon Crawler:

EX2050, '841 Application, Fig. 1

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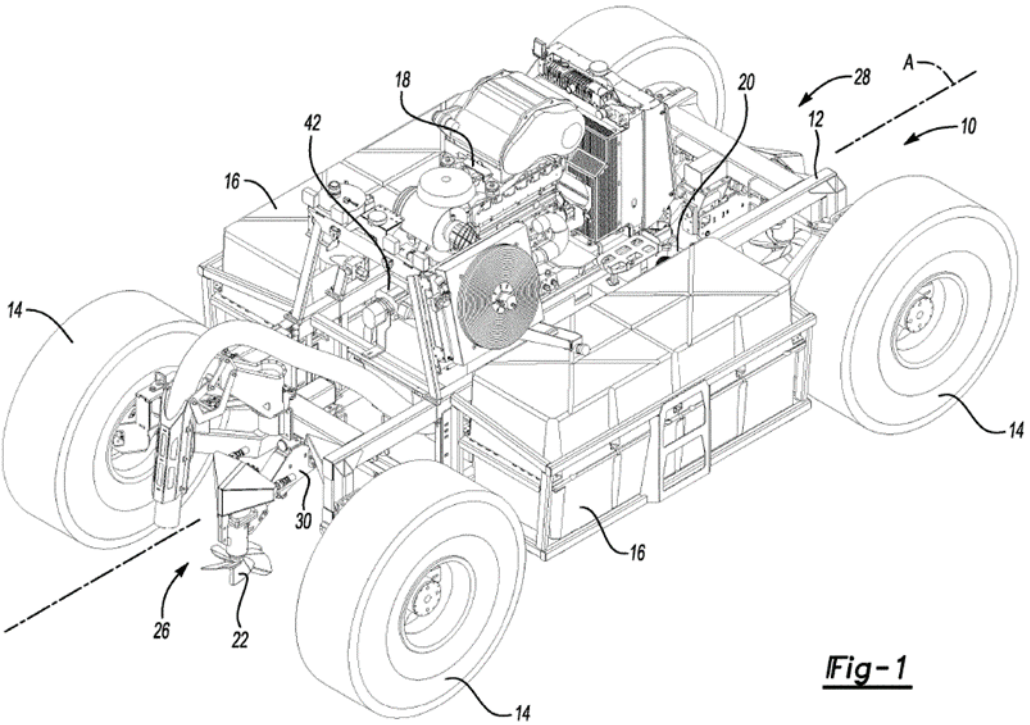


Fig-1



EX2031 at 17

EX1001, '425 Patent, Fig. 2

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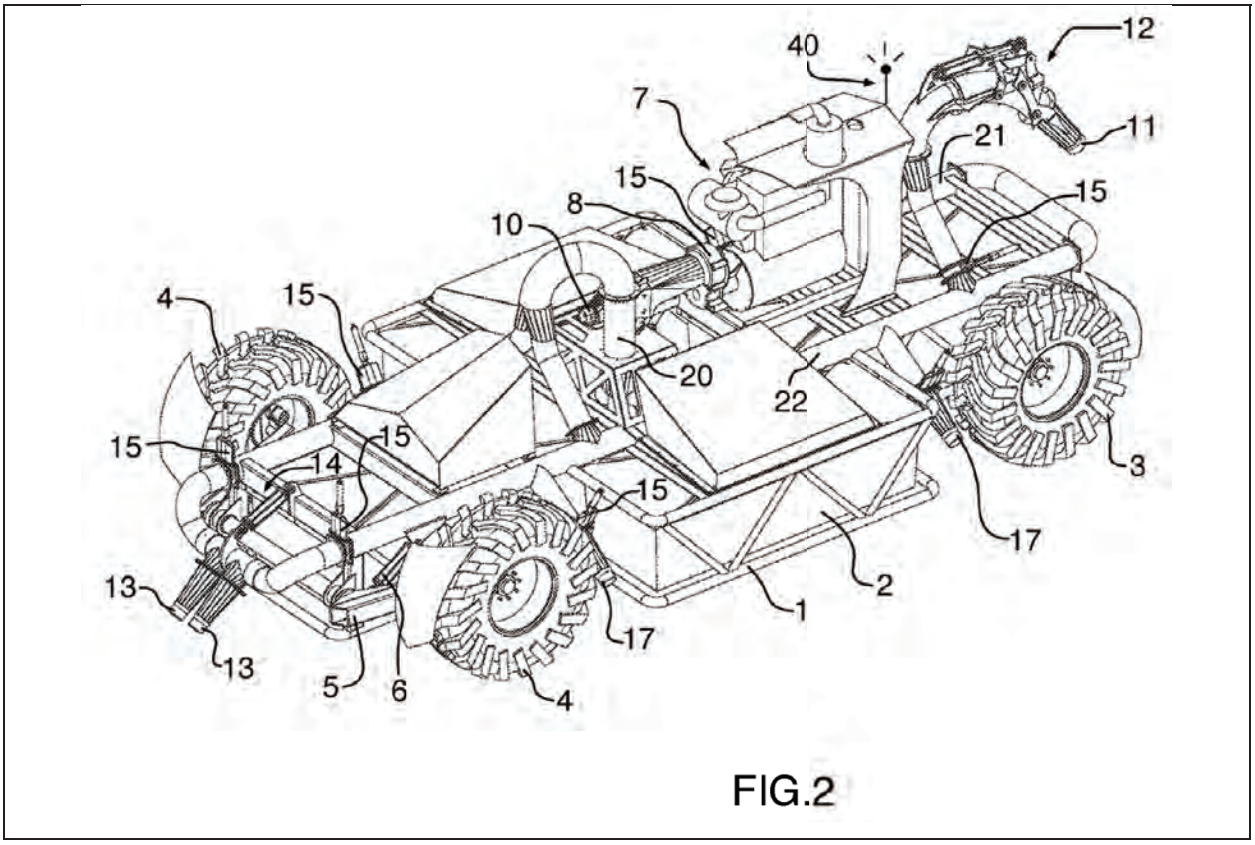


FIG.2

531. The above similarities between Nuhn's Lagoon Crawlers and Bazooka's Wolverine Agitation Boat, as well as Bazooka's non-provisional patent application shows copying of Nuhn's Lagoon Crawler by Bazooka's Wolverine Agitation Boat.

532. In summary, it is my opinion that Nuhn's Lagoon Crawlers embody the features claimed in the '425 Patent and are coextensive with the claimed features, and that there are secondary considerations of non-obviousness that show that the claims of the '425 Patent are not obvious.

XIX. PATENT OWNER'S SUBSTITUTE CLAIMS ARE PATENTABLE OVER THE CITED ART

533. I have received the Substitute Claims submitted with Patent Owner's Motion to Amend. I have reviewed the prior art considered during prosecution of the '425 Patent, during Reexamination No. 90/091,107, and IPR2023-01161. After reviewing the Substitute Claims, it is

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my opinion that the prior art I have reviewed, and have personal knowledge of, does not anticipate or render obvious the Substitute Claims.

534. The prior art known to me fails to disclose each and every limitation of Substitute Claim 22:

> An amphibious vehicle, comprising:
>
> a floatable vehicle body with a front, a rear, and an underside;
>
> ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor;
>
> a liquid manure pump for pumping liquid manure, the liquid manure pump including a housing and an impeller that are positioned along the underside of the floatable vehicle body between at least two of the ground engaging elements such that the housing and the impeller are rearward of the front of the vehicle body and forward of the rear of the floatable vehicle body and such that the impeller is immersed in and configured to pump the liquid manure when the vehicle is floating;
>
> 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 pump; 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 liquid manure 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.

535. Substitute Claims 23-42 depend from Substitute Claim 22 and are patentable because of their dependency from Substitute Claim 22.

536. The **water pumps** 202 of Carrier are illustrated as being located at the top of the vehicle:

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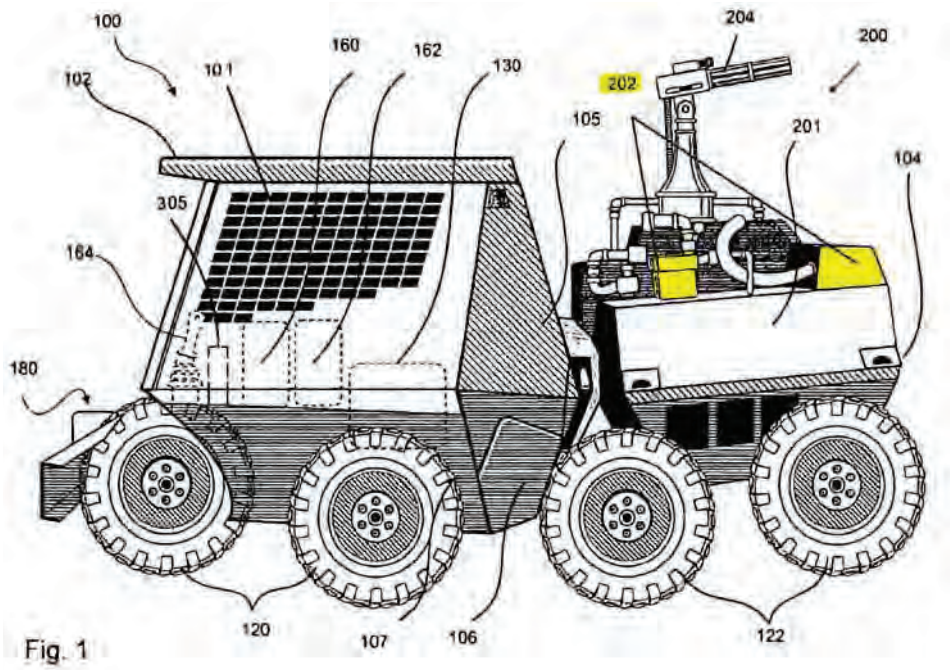


Fig. 1

EX1005, at 2.

537. A POSITA would not have understood Carrier as anticipating or rendering obvious Substitute Claim 22 and each dependent substituted claim, and specifically, the following ("the Pump Limitation"):

> a liquid manure pump for pumping liquid manure, the liquid manure pump including a housing and an impeller that are positioned along the underside of the floatable vehicle body between at least two of the ground engaging elements such that the housing and the impeller are rearward of the front of the vehicle body and forward of the rear of the floatable vehicle body and such that the impeller is immersed in and configured to pump the liquid manure when the vehicle is floating.

538. It is my opinion that a POSITA would not have understood Carrier as anticipating or rendering obvious Substitute Claims for at least the following reasons: (1) Carrier does not describe that its water pump is placed on the vehicle's underside; and (2) Carrier does not disclose a pump with an impeller immersed in and configured to pump liquid manure.

539. Truxor is a general purpose vehicle configured with *quick-connect* attachments. One of the *quick-connect* attachments is disclosed as being a *pump* and the *pump* is designed to be a quick-connect pump for dredging a *lake or stream*, ***not for pumping liquid manure*** (or animal

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manure contained in a farm lagoon, which includes suspended solids) ***within and out of an agricultural manure lagoon***. The pump of Truxor is forward of the vehicle at the end of a boom arm:



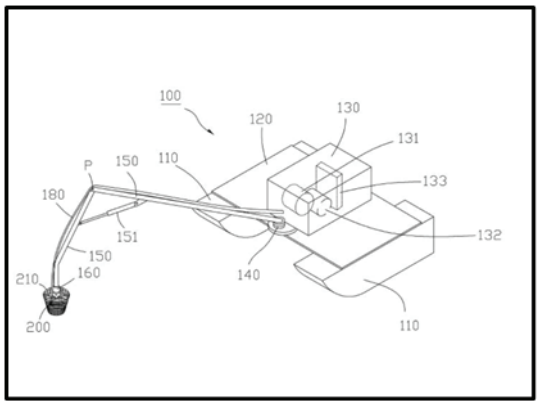


EX1006, at 11. The Truxor amphibious vehicle includes a boom arm configured to accommodate quick-connect aquatic weed cutters [EX1006, at 6-7], rakes [EX1006, at 8-9], buckets and log grabbers [EX1006, at 9], dredge pumps [EX1006, at 10-11], excavators [EX1006, at 12], cultivators [EX1006, at 13], and oil decontamination tools [EX1006, at 14-15].

540. Yoon discloses "an amphibious water treatment device that is installed at streams or on storage tanks, reservoirs." EX1011, Yoon, ¶ [0001]. Yoon includes a main body 130 in which

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a water pump 131 is installed. EX1011, Yoon, ¶ [0047]. The water pump 131 of Yoon is not immersed in the storage tank or reservoir.



EX1011, at 2.

541. A POSITA would not have understood Truxor, Yoon, and/or Carrier as rendering obvious Substitute Claim 22, and specifically, the Pump Limitation. A POSITA would not have understood Truxor, Yoon, and/or Carrier as rendering obvious the Substitute Claims for at least the following reasons: (1) the pumps of Truxor, Yoon, or Carrier are not located on an underside of the vehicle; (2) the pumps of Truxor, Yoon and Carrier are not disclosed with an impeller submersible in and configured to pump liquid manure; (3) the pumps of Truxor and Carrier are not positioned between at least two ground engaging elements; (4) the inlets of the pumps of Truxor and Yoon are positioned forward of the vehicle; and (5) Carrier does not describe any location for a pump inlet. Truxor, Yoon, and/or Carrier do not render obvious the Substitute Claims.

542. SenwaTec is a general purpose amphibious vehicle configured with *quick-connect* attachments. One of the *quick-connect* attachments is disclosed as being a *pump* and the *pump* is designed to be a quick-connect pump for dredging a *lake or stream*, ***not for pumping liquid manure*** (or animal manure contained in a farm lagoon, which includes suspended solids) ***within and out of an agricultural manure lagoon***. The pump of SenwaTec is forward of the vehicle at the end of a boom arm:

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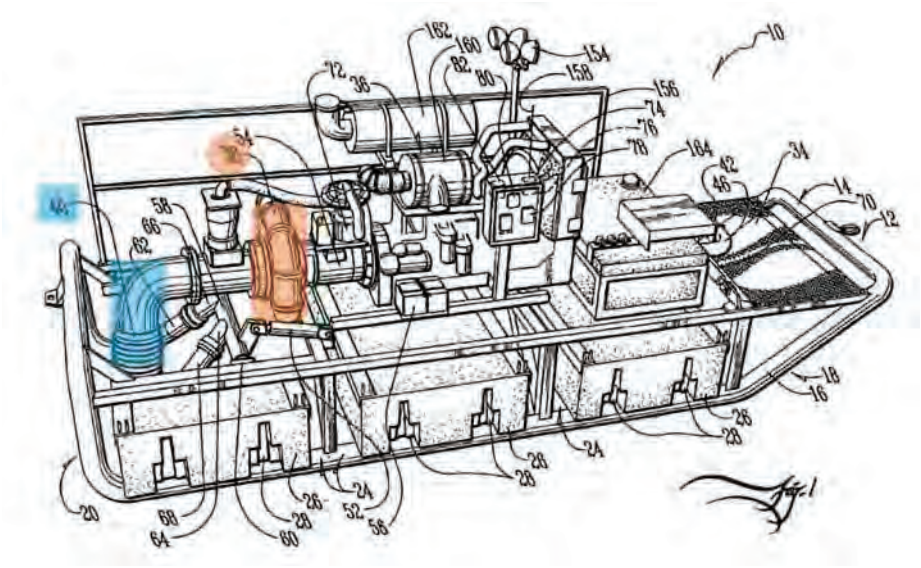


EX1012, at 1. The SenwaTec amphibious vehicle includes a boom arm configured to accommodate *quick-connect* aquatic weed cutters, rakes, buckets tree cutter and dredge pumps. EX1012, at 2.

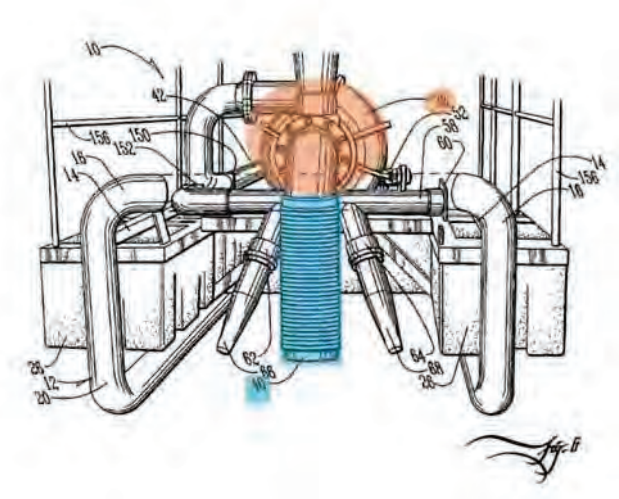
543. A POSITA would not understand SenwaTec, Yoon, and/or Carrier as rendering obvious Substitute Claim 22, and specifically, the Pump Limitation. A POSITA would not have understood SenwaTec, Yoon, or Carrier as rendering obvious the Substitute Claims for at least the following reasons: (1) the pumps of SenwaTec, Yoon, and/or Carrier are not located on an underside of the vehicle; (2) the pumps of SenwaTec, Yoon and Carrier are not disclosed with an impeller submersible in and configured to pump liquid manure; (3) the pumps of SenwaTec and Carrier are not positioned between at least two ground engaging elements; (4) the inlets of the pumps of SenwaTec and Yoon are positioned forward of the vehicle; and (5) Carrier does not describe any location for a pump inlet. SenwaTec, Yoon, and/or Carrier do not render obvious the Substitute Claims.

544. Puck discloses an agitation boat including a slurry pump (38), and is illustrated and being located on a surface of a surface of the boat:

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EX1014 at 2 (annotated).



EX1014 at 7 (annotated).

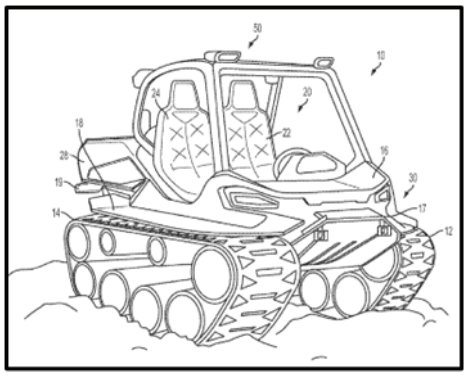
545. A liquid manure intake (40) extends towards a reward end of the boat, with a ninety-degree bend downward towards the bottom of the boat. The pump (36) is not located on the underside of the boat.

546. A POSITA would not have understood Puck and/or Bryham as rendering obvious Substitute Claim 22, and specifically, the Pump Limitation. A POSITA would not have understood Puck and/or Bryham as rendering obvious the Substitute Claims for at least the following reasons:

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(1) the pump of Puck is not located on an underside of the vehicle; (2) the pump of Puck is not disclosed with an impeller submersible in liquid manure; and (3) the pump of Puck is not positioned between at least two ground engaging elements on an underside of the vehicle, even if the ground engaging structure of Bryham was added to Puck. Puck and/or Bryham do not render obvious the Substitute Claims.

547. Bennett-II discloses a general-purpose amphibious. (EX1017).



EX1017, at 2.

548. A POSITA would not understand Puck, Bryham and/or Bennett-II as rendering obvious Substitute Claim 22, and specifically, the Pump Limitation. A POSITA would not understand Puck, Bryham and/or Bennett-II as rendering obvious the Substitute Claims for at least the following reasons: (1) the pump of Puck is not located on an underside of the vehicle; (2) the pump of Puck is not disclosed with an impeller submersible in liquid manure; and (3) the pump of Puck is not positioned between at least two ground engaging elements on an underside of the vehicle, even if the ground engaging structure of Bryham or Bennett-II were added to Puck. Puck and/or Bryham do not render obvious the Substitute Claims.

549. I have reviewed the following prior art in view of the Substitute Claims, and it is my opinion that the Substitute Claims are allowable over the prior art for at least the reasons set forth below:

550. U.S. Patent No. 7,478,817 to Carrier II (EX1020) – Carrier II does not remedy any of the failings of Carrier, discussed *supra* at Sections X.A and XII, with respect to the Substitute

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Claims and the substitute claims are allowable over Carrier II for the same reasons as allowable over Carrier I.

551. U.S. Patent Application Publication No. 2014/0288763 to Bennett (EX1016) – Bennett is the parent application of and shares the same specification as Bennett-II, discussed *supra* at Sections X.G and XVI, and the Substitute Claims are allowable over Bennett for the same reasons as allowable over Bennett-II.

552. U.S. Patent No. 5,176,098 to Royle (EX2012) – Royle discloses a boat with retractable wheels and, for purposes herein, is duplicative of Bryham discussed *supra* at Sections X.F, XV, and XVI. Royle does not disclose as pump, and the Substitute Claims are allowable over Royle for at least this reason.

553. U.S. Patent No. 3,384,047 to Remley (EX2082) – Remley discloses a boat with a water gun:

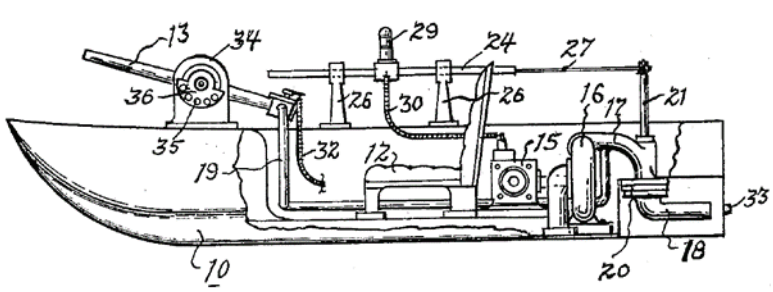


Fig. 2

EX2082, FIG. 2. Remley describes a centrifugal water pump (16) for pumping water as follows:

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Reference is now made to the accompanying drawing wherein the numeral **10** designates in the main a buoyant member in the form of a boat having an open cockpit **11** with an occupant accommodating seat **12** disposed substantially centrally therein. Forward of the cockpit **11** and mounted upon the deck of the boat **10** there is a water jet directing gun **13** having an "on" and "off" valve **14** by which the firing of the gun is controlled as will be described in more detail hereinafter. At the rear of boat **10** and located in the cockpit **11** of the boat there is a low horsepower gasoline engine **15** shown as direct-connected to a centrifugal pump **16**. The pump **16** has an intake at the bottom of the boat and an exhaust conduit **17** with a rearwardly extending nozzle **18** through which a jet of water is discharged as the boat propelling means. A pipe conection **19** is also provided for conducting water under pressure from the pump **16** and through the valve **14** to the gun **13** when firing.

EX2082, col. 2, ln. 20-37. A POSITA would not understand Remley as disclosing an impeller submersible in and configured to pump liquid manure. Accordingly, a POSITA would not understand Remley as anticipating or rendering obvious the Substitute Claims.

554. U.S. Patent Application Publication No. 2010/0144220 to Bailey (EX2084) – Bailey discloses a wheeled general-purpose amphibious vehicle. Bailey does not disclose as pump, and the Substitute Claims are allowable over Bailey for at least this reason.

555. CA2002619A1 to Depault (EX2017) – Depault discloses a pump, and the Substitute Claims are allowable over Depault for at least the reason that the pump is not located on an amphibious vehicle.

556. In view of the discussion above regarding each of the prior art references cited in the Petition for IPR against the '425 Patent, it is my opinion that a POSITA would not understand Carrier, Truxor, SenwaTec, Yoon, Puck, Bennett-II and/or Bryham to teach all the limitations of the proposed claims, and specifically, the Pump Limitation. This is because several references do not even disclose a pump and none of the pumps that are disclosed: (1) are located on an underside of the vehicle; (2) are disclosed with an impeller submersible in and configured to pump liquid manure; and (3) are positioned between at least two ground engaging elements. Thus, no combination of the art-of-record in this IPR teaches the limitations of the proposed claims.

557. I have reviewed U.S. Provisional Application No. 61/867,598 (filed August 19,

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2013) ("the '598 Application") (EX2081) and each of the substitute claims, and it is my opinion that a POSITA would have understood that the inventors possessed the substitute claims as of the filing date of the '598 Application. Moreover, the information contained in the '598 Application was sufficient to inform those skill in the relevant art how to make and use the invention.

XX. CONCLUSION

558. Based on my analysis, it is my opinion that the cited art does not anticipate or render obvious any of the Challenged Claims or the Substitute Claims of the '425 Patent.

559. 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: April 2, 2024

___ ___

Douglas S. Prairie