

Expert Declaration of Eric S. Winkel, Ph.D., P.E. In Support of Petitioner's Reply to Patent Owner's Response - Case No. IPR2024-00098

Bazooka Farmstar, LLC v. Nuhn Industries, Ltd.

DRE Project Number: EW-241008

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Date

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BAZOOKA-FARMSTAR, LLC

Petitioner,

- vs. -

NUHN INDUSTRIES LTD.,

Patent Owner.

Case No: IPR2024-00098

U.S. Patent No. 11,541,708

EXPERT DECLARATION OF ERIC S. WINKEL, PH.D., P.E.
IN SUPPORT OF PETITION FOR *INTER PARTES*
REVIEW OF U.S. PATENT NO. 11,541,708

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TABLE OF ABBREVIATIONS

Abbreviation	Definition
Bailey	U.S. Patent Application Publication No. 2010/0144220 (EX2084)
Bazooka or Petitioner	Bazooka-Farmstar, LLC
Bennett	U.S. Patent Application Publication No. 2014/0288763 (EX1016)
Bennett-II	U.S. Patent Application Publication No. 2021/0331752 (EX1017)
Bradley	Great Britain Patent No. 2,366,218
Bryham	U.S. Patent No. 7,314,395 (EX1015)
Carrier	U.S. Patent Application Publication No. 2012/0185129
Carrier-II	U.S. Patent No. 7,478,817
Challenged Claims	Claims 1-21 of U.S. Patent No. 11,358,425
CRU	The USPTO's Central Reexamination Unit
IPR	<i>Inter Partes</i> Review
Knowles	U.S. Patent No. 8,256,692 (EX1086)

Abbreviation	Definition
Lyseng	Ron Lyseng, <i>Float your boat in a slurry moat</i> , The Western Producer (August 29, 2013).
Melnikov	Russian Patent Application No. 2012137830/11 (EX1023-EX1024)
Manure-Manager	MANURE MANAGER, Jan./Feb. 2011 (EX1112)
Manure-Manager II	MANURE MANAGER, July/Aug. 2011 (EX1113)
Nuhn Pump	Patent Owner's Pump Disclosed in Manure-Manager (EX1112, 27).
Patent Owner	Nuhn Industries Ltd.
POSA	Person of Ordinary Skill in the Art
Puck	U.S. Patent Application Publication No. 2014/0112093 (EX1014)
PTAB	U.S. Patent Trials and Appeals Board
Respondent	Patent Owner or Nuhn Industries Ltd.
Tews	U.S. Patent No. 10,118,138 (EX1093)
The '125 Application	U.S. Patent Application No. 17/590,125
The '133 Provisional	U.S. Provisional Patent Application No. 61/805,133

Abbreviation	Definition
The '224 Patent	U.S. Patent No. 11,448,224
The '422 Patent	U.S. Patent No. 10,710,422
The '425 Patent	U.S. Patent No. 11,358,425
The '425 Prosecution	The Prosecution of U.S. Patent No. 11,358,425
The '425 Reexamination	The Reexamination of U.S. Patent No. 11,358,425
The '425 Reexamination Request	The Request for <i>Ex Parte</i> Reexamination of U.S. Patent No. 11,358,425
The '557 Patent	U.S. Patent No. 10,974,557
The '557 Reexamination	The Reexamination of U.S. Patent No. 10,974,557
The '557 Reexamination Request	The Request for <i>Ex Parte</i> Reexamination of U.S. Patent No. 10,974,557
The '598 Provisional	U.S. Provisional Patent Application No. 61/867,598
The '636 Patent	U.S. Patent No. 9,694,636
The '638 Patent	U.S. Patent No. 10,124,638
The '708 Patent	U.S. Patent No. 11,541,708
The '758 Patent	U.S. Patent No. 8,944,758
The '789 PCT	PCT Application No. PCT/CA2014/050,789
The '835 Patent	U.S. Patent No. 11,491,835

Abbreviation	Definition
The '015 Litigation	United States District Court for the Southern District of Iowa, Civil Action No. 3:22-cv-00015-SMR.
Truxor	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (EX1006)
Truxor-II	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (2013) (EX1024)
Truxor-III	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (2013) (EX1025)
Truxor-IV	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (EX1026)
SenwaTec	SENWATEC-SCHRÖER UMWELT-& GEWÄSSESTECHNOLOGIE GMBH & Co. KG, LIGHT AMPHIBIOUS BOAT/VEHICLE “AMPHI-KING®” SWT--AB380 (EX1012)
Sundstrom	The Sundstrom Stir Dredge (Shown and described in EX1110, EX1114, EX1115, and EX1118, 10:09-12:03)
USPTO	United States Patent and Trademark Office
Yoon	KR Publication No. 20130016490 (EX1010-EX1011)

I. INTRODUCTION

1. I have been retained by Merchant & Gould P.C. to serve as an independent expert on behalf of Bazooka in the above-referenced matter to provide my technical review, analysis, and opinions concerning the validity of claims 1-38 of the '708 Patent.

2. I previously executed a declaration relating to the validity of the '708 Patent claims, which I understand was filed with Bazooka's petition for *inter partes* review of the '708 Patent as EX1004. I am providing this declaration as a supplement to my prior declaration to address the arguments made by Nuhn and Mr. Prairie in conjunction with Nuhn's Patent Owner Response. *See* Paper 21 and EX2099.

3. I routinely take continuing education courses to expand on my knowledge base and to stay current with new developments in mechanical and marine engineering fields. A list of such continuing education and professional development activities is provided in an updated version of my curriculum vitae. EX1116. In addition, I have authored more than 30 technical publications in technical journals and conference symposia on topics including fluid mechanics, acoustics, dynamics and vibrations, and impact/injury biomechanics. A list of technical publications is provided in my updated curriculum vitae. My updated curriculum vitae also contains a list of all other cases in which, during the previous 4 years, I testified as an expert at trial or by deposition.

4. My efforts on this case continue to be billed at a rate of \$250 per hour, with reimbursement for expenses incurred. I have no financial interest in the dispute between Bazooka and Nuhn, and my compensation is not contingent upon the outcome of this IPR.

II. SUMMARY OF OPINIONS

5. A summary of my opinions regarding the validity of claims 1-38 of the '708 Patent is provided in my previous declaration. EX1004, ¶¶12-20. My opinions on these topics remain unchanged since the filing of that declaration.

III. LEGAL PRINCIPLES

6. I am not an attorney. My understanding of patent law and the applicable legal principles and standards comes from explanations provided to me by counsel.

A. Invalidity by Anticipation, Obviousness, and Interpreting Claims Before the Patent Office

7. My prior declaration, executed on November 3, 2023, outlines my understanding of various aspects of patent law, including invalidity by anticipation, obviousness, and interpreting claims before the USPTO. EX1004, Section III.A-C.

B. Secondary Considerations

8. I understand that there are a number of secondary considerations that may serve as objective indicia of non-obviousness. I understand that secondary considerations are weighed against any prima facie showings of obviousness. Therefore, I understand that the mere presence of secondary considerations is not

enough to overcome a strong showing of obviousness unless the objective evidence is sufficient to overcome the prima facie showing of obviousness.

9. I understand that secondary considerations that may be used to support an argument of non-obviousness include: (1) whether the patent owner's invention solved a long felt but unsolved need; (2) whether others have failed to successfully solve the problem solved by the patent owner's invention; (3) the commercial success of products that embody the patent owner's claims; (4) the presence of unexpected results; (5) praise of the invention by others in the same industry; and (6) copying of the invention.

10. I understand that there must be concrete evidence of the presence of secondary considerations to serve as objective indicia of non-obviousness. I understand that the patent owner must present evidence that is more substantial than mere assertions that the considerations are present. Therefore, I understand that secondary considerations that lack substantial evidentiary support do not weigh in favor of the non-obviousness of a patent owner's claims.

11. I understand that, to serve as objective indicia of non-obviousness, there must be a nexus between the secondary considerations and the inventiveness of the claims. Therefore, I understand that the existence of secondary considerations due to reasons that are not related to the inventiveness of the patent owner's claims will not indicate that the claims are non-obvious.

12. I understand that a patentee is entitled to a rebuttable presumption of nexus between the asserted evidence of secondary considerations and a patent claim if the patentee shows that the asserted evidence is tied to a specific product and that the product is the invention disclosed and claimed. Thus, I understand that presuming a nexus is appropriate when the patentee shows that the asserted objective evidence is tied to a specific product and that product embodies the claimed features and is coextensive with them. On the other hand, I understand that when the product that is commercially successful is not coextensive with the patented invention the patentee is not entitled to a presumption of nexus. I understand that a patent claim is not coextensive with a product that includes a critical unclaimed feature that is claimed by a different patent and that materially impacts the product's functionality.

13. I understand that when the patent owner's claims are embodied in a product, it is indicative of non-obviousness if the product produces unexpected results. I also understand that what is unexpected for the sake of unexpected results is judged from the point of view of the POSA. Therefore, I understand that a POSA having a higher level of expertise in the field of endeavor would have a more rigorous standard for what results are unexpected compared to a POSA having less expertise in the field.

14. I understand that the copying by market competitors of a product that embodies the patent owner's claims is a secondary consideration that may serve as

objective indicia of non-obviousness. I understand that copying is only equivocal evidence of non-obviousness when there are no other compelling indicia of non-obviousness present. Thus, solely copying would not suffice as strong evidence of non-obviousness.

15. I understand that a claim-embodiment product's fulfillment of a long felt but unsolved need in the field of endeavor is a secondary consideration that may serve as objective indicia of non-obviousness for the claims. Alternatively, I understand that a product that fulfills a need that has already been solved by the prior art is not indicative of non-obviousness.

C. Materials Considered

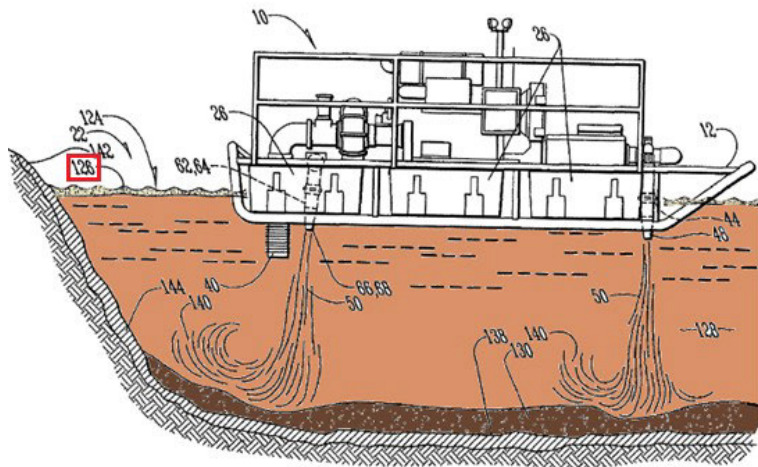
16. In forming the opinions expressed in this declaration, I have relied on my own knowledge, experience, and expertise, as well as the knowledge of a POSA in the relevant timeframe. In addition, I have reviewed and relied upon all documents and materials referenced in my declarations submitted in conjunction with IPR Nos. IPR2023-01161; IPR2024-00004; and IPR2024-00098 and Reexamination Nos. 90/019,428; 90/019,290; 90/019,302; and 90/019,482. I have also reviewed and considered the declarations of Douglas Prairie submitted in conjunction with each of these IPRs, as well as the additional materials provided in Appendix A.

IV. BACKGROUND

17. The '708 Patent describes that as-excreted “[m]anure produced during animal husbandry ... is transferred by washing [with water] to a pit or lagoon for storage,” (EX1001, 1:35-38) after which the diluted “[l]iquid manure ... [is] *irrigate[d]* onto farm land for disposal.” EX1032, 1:14-17 (emphasis added) (incorporated-by-reference).

18. When stored in a lagoon, liquid manure stratifies into layers including a bottom sludge layer 130 with settled solids (brown, below), a watery liquid supernatant layer 128 (orange) above the sludge layer, and occasionally, a crust 126 of floating fibrous material (yellow). EX1014, ¶¶[0003]-[0004], [0034], FIG. 4. Before irrigating the lagoon onto farmland for fertilizer, lagoons may be agitated by pumping the watery liquid supernatant layer and shooting it against the nutrient rich sludge layer and crust so that the nutrients at the bottom of the lagoon are moved into suspension within the watery upper supernatant layer. *Id.*, ¶[0004]. As shown by Puck and recognized by others, POSAs understood that pumping this watery supernatant layer was more efficient than pumping the sludge at the bottom of the lagoon. *See, e.g., id.*, FIG. 4; EX1038, 5 (“[O]perators float the intake 18 to 24 inches below the surface and do not use an intake strainer (Figure 9). This keeps the intake free of floating debris, and above the sludge layer at the bottom of the lagoon.”). At that point, conventional farmland irrigation (water pumping) equipment may be used

to pump the nutrient-rich liquid manure mixture onto farmland for fertilization. EX1032, 1:14-17; EX1037, 64; EX1061, 15; EX1063, 88; EX1099, ¶7. Using this irrigation equipment, liquid manure is transferred “at a much faster rate than hauling,” making the application process more efficient. EX1061, 15.



EX1014, FIG. 4 (annotated).

19. It is with this context that a POSA, having a familiarity with liquid manure, would have understood the pumping requirements of the vehicle of the '708 Patent. A POSA would have understood that an agitated liquid manure lagoon could have, and likely would have, a total solids content of less than about 5% because “[m]anure that has a TS concentration of less than 5 percent ... can be irrigated for land application of liquids from lagoons.” EX1060, 81. And POSAs would have understood that, pre-agitation, the supernatant layer has a lower solids content than the post-agitation liquid manure mixture, because the solids in the sludge and crust portions of the lagoon would not yet be mixed within the watery supernatant layer.

POSAs would have understood that, since conventional irrigation pumps could pump 5% total solid post-agitation mixtures onto farm fields, such pumps would also pump the near water-like consistency of pre-agitation supernatant to agitate the lagoon into a homogeneous mixture.

V. PERSON OF ORDINARY SKILL IN THE ART

20. I understand that Nuhn and Mr. Prairie have proposed an alternative definition for a POSA as “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.” Paper 20 at 7; EX2004, ¶¶64.

21. Along with his own definition, Mr. Prairie offers two criticisms (EX2099, ¶¶59-60) of my previously provided POSA definition. EX1004, ¶¶60. First, Mr. Prairie alleges that my definition excludes those most familiar with manure agitation equipment. EX2099, ¶¶59. Second, Mr. Prairie criticizes my definition as being overly generic and made without reference or regard to the sole application for the claimed vehicle – manure lagoon agitation/pumping. *Id.*, ¶¶60. These criticisms miss the mark. As explained in more detail below, livestock farmers and manure applicators would not possess the requisite expertise on a variety of topics pertinent to a remotely controlled amphibious pumping vehicle. In addition, Mr. Prairie is incorrect in his suggestion that my POSA definition is made without regard

to “the sole application for the claimed vehicle.” *Id.* Contrary to his assertions, as explained more below, my definition is based on the technical fields and technical training and background of a technical expert on the various topics pertinent to a remotely controlled amphibious pumping vehicle.

22. As support for his POSA definition, Mr. Prairie states that the ’708 Patent has been classified as being directed to “amphibious vehicles specially adapted for particular purposes” and “manure” handling. EX2099, ¶62. Mr. Prairie also opines that the claimed vehicle has no “utility in doing anything other than operating in manure lagoons.” *Id.*, ¶63. Mr. Prairie is wrong.

23. As the PTAB correctly found in its institution decision, the ’708 Patent claims are not limited to livestock farmer or commercial manure applicators. Paper 10 at 9. Instead, the summary of the invention and preamble of the claims are directed to a general “amphibious pumping vehicle.” EX1001, 1:58-59; 8:39. While the ’708 Patent does provide some discussion of liquid manure pumping, it also discusses various other uses for the vehicle and pump, such as driving the vehicle on land across “wet or muddy conditions” and “pumping fluid from rivers, ponds, lakes, [and] rain water storage reservoirs.” EX1001, 2:23-26; EX1032, 4:3-8 (incorporated-by-reference).

24. Mr. Prairie’s POSA definition is fundamentally flawed on multiple levels. First, Mr. Prairie opines that a POSA may be “a livestock farmer or

commercial manure applicator familiar with manure agitation equipment.” EX2099, ¶64. Aside from utilizing various implements and equipment, experience as a livestock farmer or a commercial manure applicator would not include any training or education related to engineering design. Simply because a farmer or applicator has experience using equipment does not necessarily make them knowledgeable about the various engineering and design principles. This is akin to suggesting that a commercial truck driver would be a POSA for engineering design topics for heavy trucks because of their experience utilizing and driving trucks. However, no amount of field use experience provides a commercial truck driver with the knowledge and expertise on engineering topics such as diesel engine performance, power transmission systems, electrical controls, etc., on tractor-trailer systems. Mr. Prairie is wrong because there is no basis for asserting that farmers and manure applicators have specific knowledge and expertise pertinent to designing remote-control amphibious pumping vehicles.

25. While a livestock farmer or manure applicator may certainly be capable of servicing or performing maintenance on farming equipment, as Mr. Prairie alleges, a farmer is not equipped to design a multi-functional amphibious vehicle like the one described in the '708 Patent. Rather, this is a task that would be performed by an engineer. Addressing marine propulsion, marine hydrodynamics, and stability; selecting and designing hydraulic and mechanical systems for power

transmission systems; and implementing remote control and software systems are activities that engineers perform on a regular basis. They are not activities ordinarily performed by livestock farmers or manure applicators.

26. Second, Mr. Prairie opines that a POSA could alternatively be “an engineer with at least 2 years of experience designing agricultural equipment and knowledge of manure agitation equipment.” *Id.* Mr. Prairie’s alternative definition is also incorrect. Agricultural equipment is a broad category and there are many different types of agricultural products and equipment, the overwhelming majority of which differ significantly from remote-control amphibious pumping vehicles. Importantly, Mr. Prairie has not shown, nor has he even attempted to show, how two years’ experience designing “agricultural equipment” would correlate to the design of remote-control amphibious pumping vehicles. There are many types of agricultural equipment and, to my knowledge, very few incorporate technologies for remote control of amphibious vehicles that need to be propelled and controlled on both land and water.

27. Mr. Prairie has not provided any technical support that his hypothetical POSA with two years’ experience designing agricultural equipment would have encountered remote control systems, let alone remote-control systems for amphibious vehicles and/or pump systems. Mr. Prairie has not demonstrated that his

hypothetical POSA would have any experience or training in marine propulsion systems, hydrostatics/stability, or hydrodynamics of floating vessels.

28. Furthermore, as the PTAB acknowledges, Petitioner’s definition of a POSA properly includes a broad familiarity with “fluid pumps and livestock manure.” Paper 10 at 9-10. Nuhn has argued against this definition for not requiring a POSA to have hyper-specific knowledge of manure storage systems. IPR2024-00004, Paper 23 at 8-10. But knowledge of livestock manure would necessarily include knowledge of how it is stored. To the extent it does not, Nuhn’s own POSA definition also fails, as Nuhn presents as an alternative definition, an engineer having only “knowledge of manure agitation equipment”—not storage places for manure. Paper 20 at 7.

29. It is my opinion that Mr. Prairie is not a POSA. For example, I understand that during his deposition, Mr. Prairie was unable to identify any structural features of a centrifugal pump (EX1095, 47:12-52:23) or pumps that are capable of pumping liquid manure (*id.*, 15:22-30:3). It is my opinion that a POSA would have been able to identify such structural features of a centrifugal pump or a pump capable of pumping liquid manure. Furthermore, despite requesting pictures of such pumps before identifying their features (*id.*, 49:13-52:23, 77:14-80:15), when presented with pictures of the Nuhn Pump centrifugal pump, Mr. Prairie remained unable to identify any associated components. *Id.*, 274:21-278:17. Mr.

Prairie was also unable to identify any specific pump structure that would be required to pump liquid with suspended solids. *Id.*, 53:9-71:23. Because Mr. Prairie could not or would not identify specific features in the prior art, in my opinion, he is unqualified to opine on the same. *See id.*, 206:18-213:3 (Puck), 239:7-243:7 (Carrier), 121:3-131:24 (SenwaTec). Once again, it is my opinion that a POSA would have been able to look at such photos of pumps and the prior art and identify associated components.

VI. CLAIM CONSTRUCTION

30. I understand that Bazooka identifies that the terms “between” and “liquid manure pump” as requiring construction. It is my opinion that Bazooka’s proposed constructions of each of these claim terms are correct and that Nuhn’s proposed constructions for each of these claim terms are wrong. In addition, as discussed below, I disagree with Nuhn’s and Mr. Prairie’s representation of the term “liquid manure” and its various assertions as to the solid content, particulate sizes, pumping requirements, and other physical characteristics. Their representations are unreasonable and completely at odds with what a POSA would have understood, as explained herein.

A. “Between”

31. Claims 15, 17, 21, and 23 of the ’708 Patent recite similar variations of a “first buoyant element situated between the first front wheel and the first rear

wheel” and “a second buoyant element between the second front wheel and the second rear wheel.” I understand that the PTAB preliminarily construed “between” as meaning “in the space that separates.” Paper 10 at 13-15. It is my opinion that the proper construction of the term “between” is more broadly “in intermediate relation to.” My opinion is supported by the intrinsic evidence, including the ’708 Patent figures, the ’835 Patent substitute claims, Nuhn’s pending continuation patent application, and the references cited on the face of the ’708 Patent.

i. Nuhn’s ’708 Patent Figures.

32. Despite using the term “between” in describing the arrangement of the buoyant elements and the wheels in the claims, the ’708 Patent never uses “between” to describe positional arrangements of vehicle components. Rather, Nuhn draws support for this term from its figures, which Nuhn alleges depict the buoyant elements “between” the wheels. However, the ’708 Patent figures do not support a restrictive definition of the term. While some of the ’708 Patent figures do show a buoyant element situated in the space that separates the front and rear wheels on each side of the vehicle, Figure 1 of the ’708 Patent shows the wheels 3, 4 of the vehicle lowered to a position below the vehicle body 1. Thus, in Figure 1 of the ’708 Patent, the buoyant element 2 is located above the space that separates wheels 3, 4—not within the space that separates the wheel 3, 4. Despite this, I understand that Nuhn’s expert agreed in his deposition that when the wheels are lowered below the vehicle

body, as shown in Figure 1, he still considers the buoyant elements to be positioned “between” the wheels. EX1094, 197:14-198:14. Based on the various configurations shown in the ’708 Patent, a POSA would have understood that the term “between” (as used in claims 15, 17, 21 and 23) covers the arrangement of the buoyant elements shown in Figure 1, where the buoyant elements are positioned above “the space that separates” the left front wheel and the left rear wheel or the right front wheel and the right rear wheel. Thus, a broader definition of the term “between” must apply.

33. Therefore, it is my opinion that the proper construction of “between” would be the more general definition “in intermediate relation to” as used by Merriam-Webster. EX3002, 1. Figure 1 of the ’708 Patent depicts the buoyant element 2 “in intermediate relation to” the rear wheel 3 and the front wheel 4 (i.e. forward of the rear wheel 3 and rearward of the front wheel 4). Thus, it is my opinion that “between” should be construed as “in intermediate relation to.”

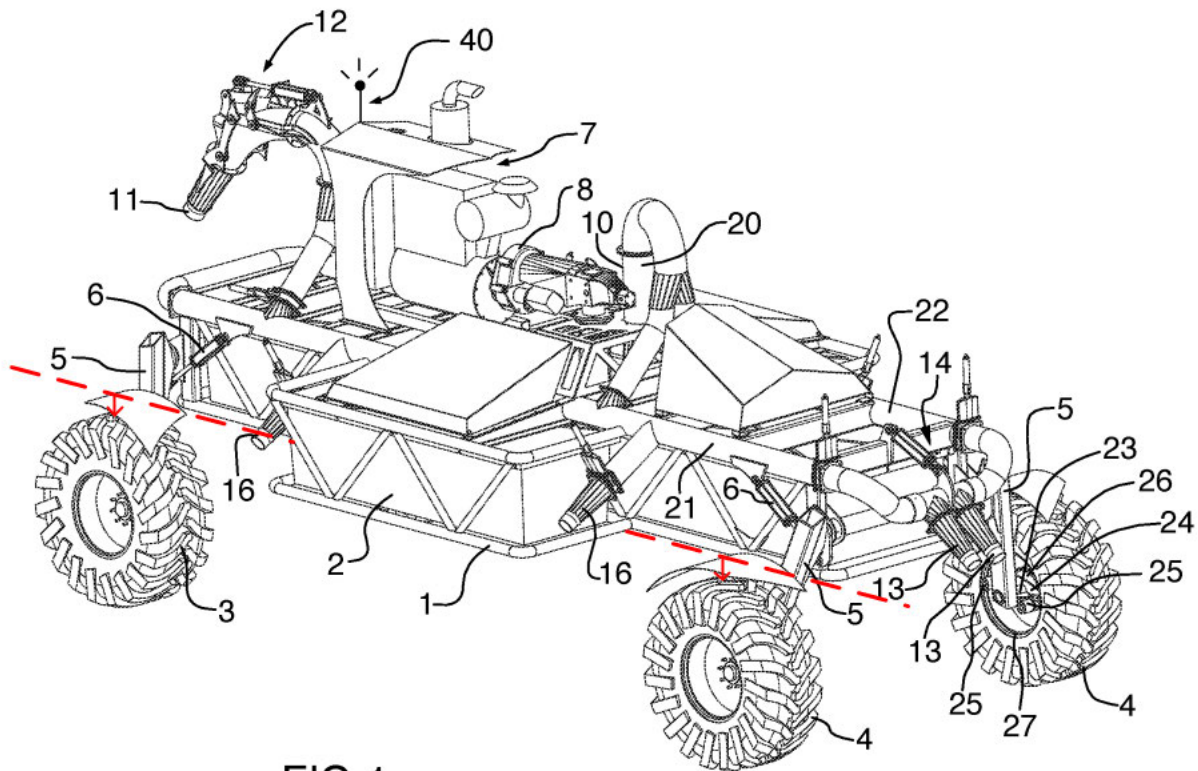


FIG.1

EX1001, FIG. 1 (annotated).

ii. Nuhn's '835 Patent Substitute Claims.

34. I understand that where multiple patents derive from the same parent application and share many common terms, the claims must be construed consistently across all asserted patents. While Nuhn now argues for a restrictive definition of “between” with respect to the ’708 Patent claims, Nuhn’s definition here is inconsistent with its use of “between” in its other claims. Specifically, in the ’835 Patent IPR, Nuhn uses the term “between” in substitute claims 43 and 59 to describe the position of the hydraulic pump. For example, substitute claims 43 and 59 recite “wherein the hydraulic pump is positioned *between* the power source and

the immersible liquid manure pump....” IPR2024-00004, Paper 21 at 28 and 33 (emphasis added).

35. As support for this claim element, Nuhn cites to paragraphs [0008], [0023], and [0033] of its provisional patent application (EX2081). IPR2024-00004, Paper 21 at 7, 9. None of these referenced paragraphs describe the relative positioning of the hydraulic pump, power source, and the fluid pump, let alone state that the hydraulic pump is positioned “between” the power source and the fluid pump. Paragraphs [0008] and [0033] describe various power sources that may be used on the vehicle, and various components that the power source may be connected to. Paragraph [0023] refers to Fig. 7 as disclosing a perspective view of a “mechanical drive [8] connecting the power source [7 (red)] of the vehicle to the fluid pump [9 (yellow)] and a hydraulic pump [10 (blue)] of the vehicle.” EX2081, ¶[0023].

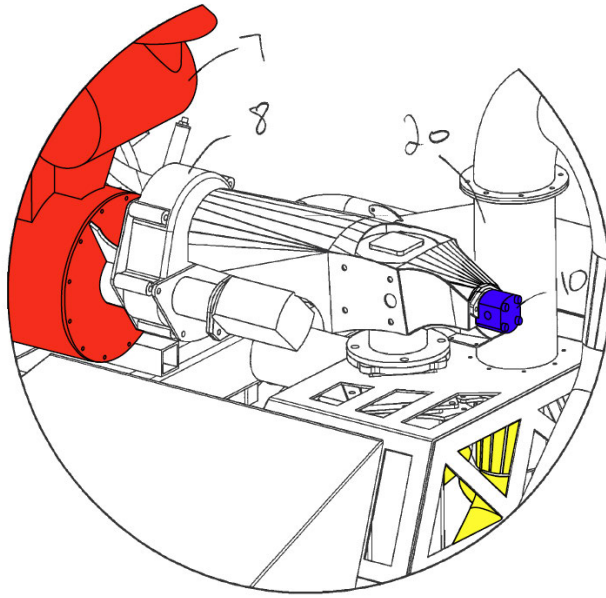
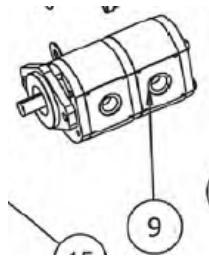


Fig. 7

EX2081, FIG. 7 (annotated).

36. Such a hydraulic pump is similarly shown and identified as “Crawler - Hydraulic Multi Pump PLP30.2750” in the Version 1 Lagoon Crawler parts manual:

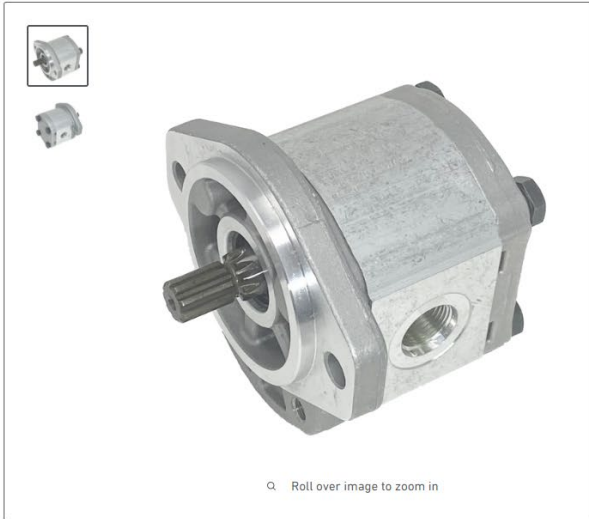


9	1	104-032	Crawler - Hydraulic Multi Pump PLP30.2750
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EX2037, 46.

37. Similar style hydraulic pumps are available for purchase online. For example, the following pump is available for sale at www.OneHydraulics.com.

Home > All products > PLP20.950-03S1-LOC/OC-N-EL : Casappa ...



PLP20.950-03S1-LOC/OC-N-EL : Casappa
Polaris Gear Pump, 9.17cc, 3625psi Rated,
3500RPM, CCW, 9T 16/32dp Shaft, SAE A 2-Bolt
Flange, 0.625 (5/8") #10 SAE Inlet, 0.625 (5/8")
#10 SAE Outlet, Aluminum Body & Flange

Save \$19.58

CASAPPA | SKU: PLP20.950-03S1-LOC/OC-N-EL

Usually Ships Within: 20 Weeks

Price: **\$371.99** \$391.57

Quantity:

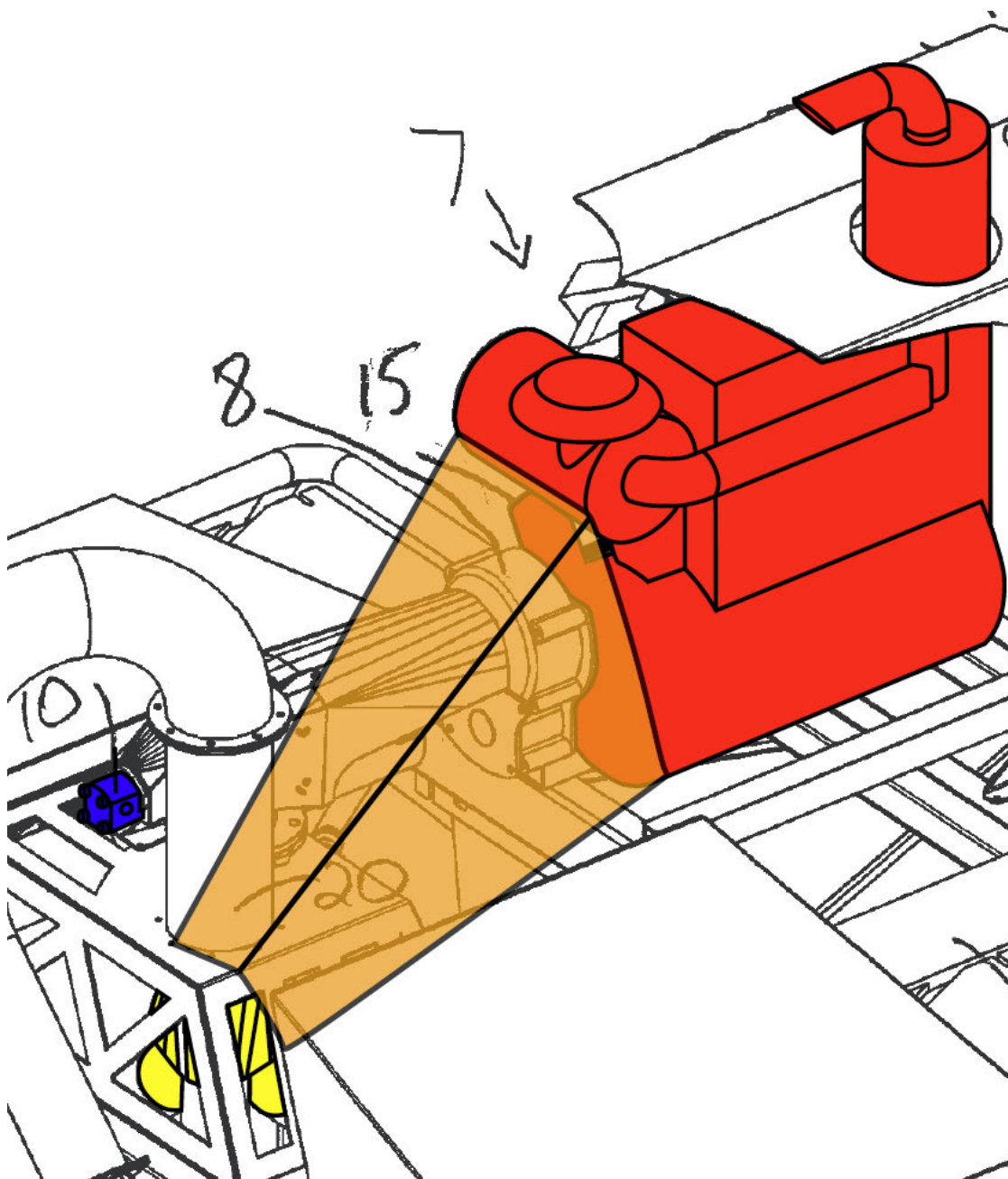
EX1112, 1.

38. Given the similar depictions of the hydraulic pumps in EX2081, EX2037, and EX1112, a POSA would have understood that the body of the hydraulic pump 10 of EX2081 is limited to the relatively small component identified by reference number 10 and highlighted in blue above. Nuhn's expert agrees. EX1194, 178:23-179:9, 192:23-25.

39. It is my opinion that the PTAB's preliminary construction of "between" is inconsistent with how Nuhn uses the term "between" to describe the position of the hydraulic pump, as identified in the figures by reference number 10, in substitute claims 43 and 59 of the '835 Patent.

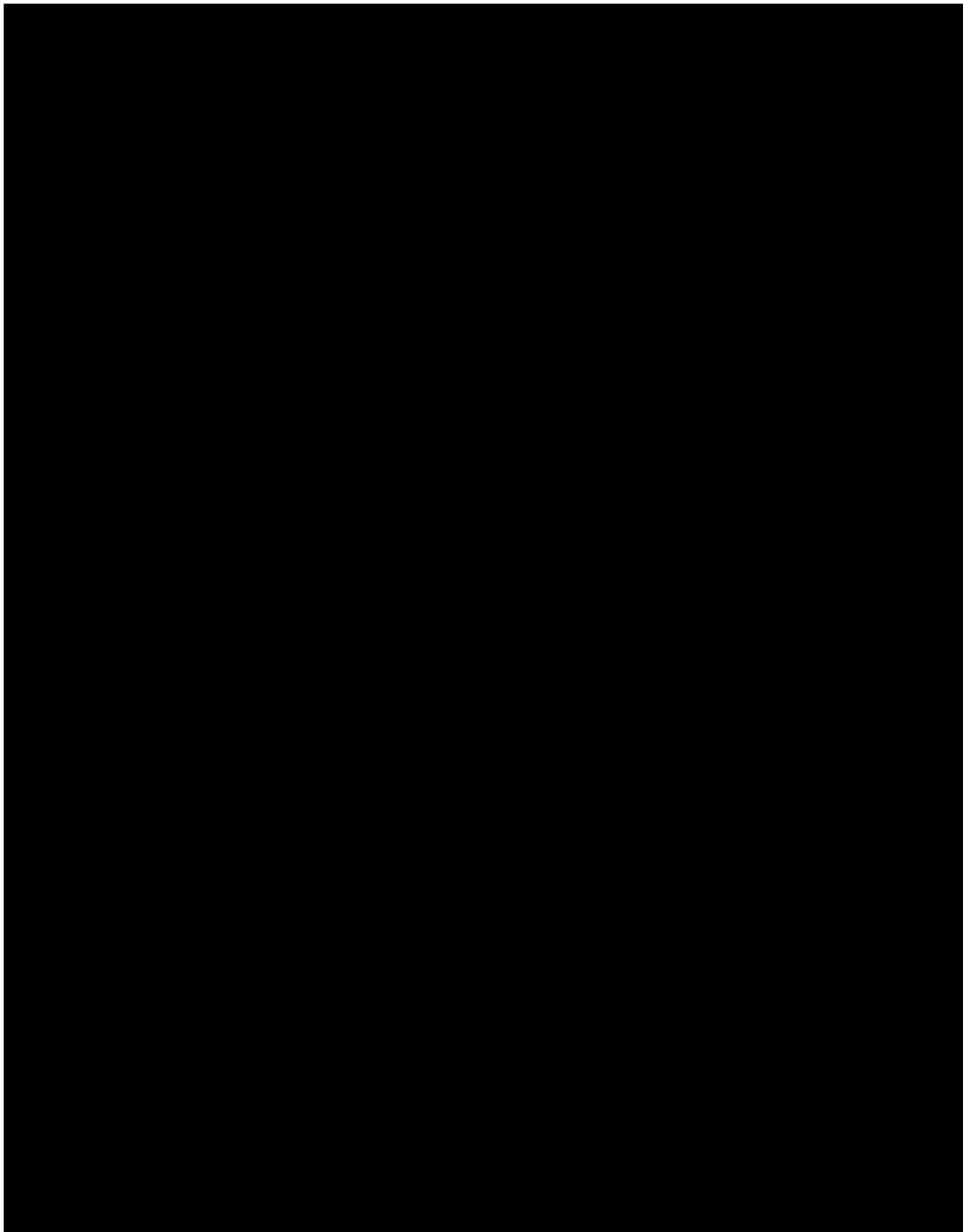
40. I understand that patent drawings are considered intrinsic evidence in claim construction. When viewing the patent drawings a POSA would have

understood that the hydraulic pump 10 (blue) is not located “in the space that separates” (orange) the fluid pump 9 (yellow) and the power source 7 (red), as illustrated in the image below. Instead, the hydraulic pump 10 (blue) is located above and to the side of “the space that separates” (orange) the fluid pump 9 (yellow) and the power source 7 (red).



EX2081, FIG. 2 (annotated).

41. This is further confirmed by analyzing Nuhn's CAD models that Ian Nuhn identified as the basis for the figures of the '708 Patent (*see* EX2083, 12; EX1096, 19:4-20:18):



EX1080-EX1081 (annotated).

42. The hydraulic pump is not located “in the space that separates” the fluid pump and the power source. Given the Patent Owner’s use of the term “between” to describe the arrangement of the “hydraulic pump” with respect to the “liquid manure pump” and the “power source,” a broader construction of the term “between” is required. Specifically, the preliminary construction “in the space that separates” proposed by the PTAB in the ’708 Patent IPR is inconsistent with the manner in which Nuhn uses the term “between” in its proposed amended claims.

43. Therefore, it is my opinion that the proper construction of “between” is the more general definition “in intermediate relation to” as used by Merriam-Webster. EX3002. While the hydraulic pump in the figures of the ’708 Patent is not “in the space that separates” the fluid pump and the power source, it is broadly located “in intermediate relation to” the fluid pump and the power source (i.e. above the fluid pump and below the top of the power source). Thus, the term “between” should be more broadly construed as “in intermediate relation to.”

iii. Nuhn’s Pending Continuation Application.

44. Nuhn’s other pending claims filed in connection with its continuation patents also support a broader interpretation of the term “between” as meaning “in intermediate relation to.” For example, U.S. Application No. 18/073,035 includes pending claim 52, which states “wherein the pump housing and the impeller of the

liquid manure pump are positioned *between* the spindles supporting the front set of wheels and the spindles supporting the rear set of wheels.” EX1089, 14 (emphasis added). Nuhn’s expert agreed that “[i]f the pump were raised to its fully raised position so that the impeller of the pump was above the spindles of the wheels[,]” the pump impeller would still be properly considered between the spindles supporting the front set of wheels and the spindles supporting the rear set of wheels. EX1094, 148:13-149:17. When placed in this raised configuration, the pump impeller would not be located “in the space that separates” the spindles supporting the front set of wheels and the spindles supporting the rear set of wheels. However, when raised above the spindles of the wheels, the pump impeller would still be located “in intermediate relation to” the spindles supporting the front set of wheels and the spindles supporting the rear set of wheels (i.e. rearward of the spindles supporting the front set of wheels and forward of the spindles supporting the rear set of wheels). Thus, both Nuhn’s expert and I agree that a broader construction of “between” is needed in consideration of pending claim 52 of U.S. Application No. 18/073,035.

iv. Cited References in the ’708 Patent.

45. Other intrinsic evidence, including the references cited on the face of the ’708 Patent, also supports a more expansive interpretation of the term “between”

as meaning “in intermediate relation to.” These references include Bailey (EX2084), Knowles (EX1086), and Tews (EX1093).

46. While the institution decision considered Bailey, it is my opinion that the institution decision was based on an incorrect understanding of the structure of the sentence quoted from Bailey. Bailey states: “[t]wo pairs of intermediate axles supporting wheels 128 are located between the front and rear wheels 124, 126, each pair of wheels 128 on either side of the vehicle 110 (all shown protracted).” EX2084, ¶[0032].

47. The subject of the sentence is “two pairs of intermediate axles”—not “axles supporting wheels.” Thus, the main clause of the sentence is “Two pairs of intermediate axles ... are located between the front and rear wheels.” The phrase “supporting wheels 128” is an adjectival phrase describing the function of the intermediate axles. This adjectival phrase does not change the fact that the axles are what is being positioned “between” the front and rear wheels.

48. An example further illustrating this point is the sentence: “my hand supporting this cup is attached to my body.” The main clause of the sentence is “my hand ... is attached to my body.” The phrase “supporting this cup” is an adjectival phrase describing the function of my hand. The adjectival phrase does not change the fact that the main subject (my hand) is what is attached to my body—not “this

cup.” Similarly, “supporting wheels” is an adjectival phrase describing the function of the axles, which are positioned between the front and rear wheels.

49. This is confirmed by other portions of Bailey. Claim 1 of Bailey, for example, identifies the position of the intermediate axle independently from the later described “wheel supporting” function. Claim 1 states that “the land propulsion means comprises at least two axles spaced apart along the length of the vehicle and at least one intermediate axle positioned therebetween...” *Id.*, Claim 1.

50. As acknowledged by the institution decision, the sentence in paragraph [0032] describes Figure 6 of Bailey: “[t]wo pairs of intermediate axles supporting wheels 128 are located between the front and rear wheels 124, 126, each pair of wheels 128 on either side of the vehicle 110 (all shown protracted).” *Id.*, ¶[0032]. Figure 4 depicts a cross sectional view of Figure 3 of Bailey (which is analogous to Figure 6 of Bailey) and shows how the diameter of the axles are significantly smaller than the diameter of the wheels that they support. Therefore, because the intermediate pair of axles (attached to wheels 128) in Figure 6 are not located “in the space that separates” the wheels 126, 124, the term “between” is properly construed more broadly as “in intermediate relation to.” The intermediate pair of axles (attached to wheels 128) in Figure 6 are located in intermediate relation to wheels 124, 126 (i.e. forward of the rear wheel 126 and rearward of the front wheel 124).

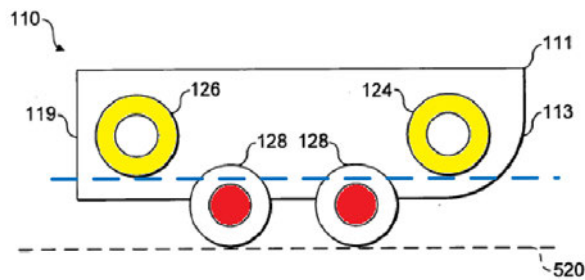


FIG. 6

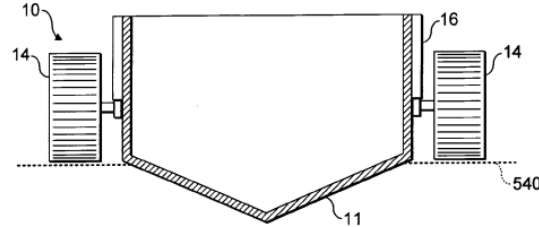
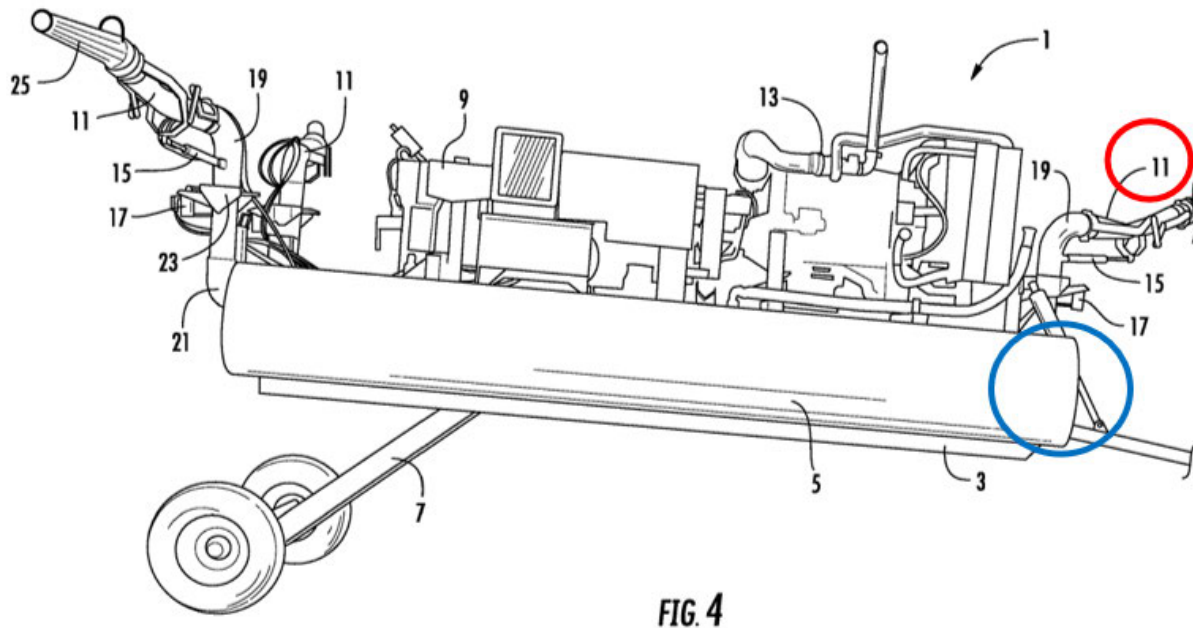


FIG. 4

Id., FIG. 6 (annotated), FIG. 4 (cross-sectional view of analogous FIG. 3 illustrating the axles that support the wheels 14).

51. Even ignoring the above-quoted sentence in paragraph [0032] of Bailey, I understand that Nuhn's expert conceded in his deposition that the inner circles (annotated above in red) within circles 128 would be properly considered to be "between" the outer circles 124, 126 (annotated above in yellow) of Bailey. EX1094, 99:7-23. The inner red circles are not "in the space that separates" the outer yellow circles. Thus, Nuhn's expert agrees that the term "between" should be construed to have a more expansive definition than "in the space that separates." As described above, the red circles are properly understood as "in intermediate relation to" the yellow circles. (i.e. forward of the rear yellow circle and rearward of the front yellow circle), but the red circles are not located "in the space that separates" the yellow circles. Thus, a POSA would have understood that Bailey uses the term "between" in a broader manner than the restrictive "in the space that separates."

52. Knowles (EX1086) with relation to Figure 7, describes “a pair of braces 36a and 36b [(red, below)] rigidly secured to and extending between the upright structural member 34 [(blue)] and the center beam 24 [(yellow)].” EX1086, 4:53-55. However, neither brace (36a or 36b (red)) is depicted “in the space that separates” the upright structural member 34 and the center beam 24. A POSA viewing Figure 7 of Knowles would have understood that the braces are positioned outboard of the upright structural member 34 and the center beam 24, and that no portion of either brace occupies the spaces that separates items 34 and 24 of Knowles. However, a POSA would have understood that each of the braces is located “in intermediate relation to” the upright structural member 34 and the center beam 24 (i.e. below and rearward of the upright structural member 34 and above and forward of the center beam 24). Like Bailey, Knowles uses “between” in a manner that requires a broader definition than “in the space that separates,” and in my opinion the proper definition for “between,” as used in Knowles, would be “in intermediate relation to.”



EX1093, FIG. 4.

54. However, as acknowledged by Nuhn's expert, Tews' nozzle 11 (red) is not located "in the space that separates" the opposing front corners (blue) of the vehicle. EX1094, 221:13-222:1. The nozzle 11 is located "in intermediate relation to" the front corners of the vehicle (i.e. right of the left front corner and left of the right front corner).

55. Because the intrinsic evidence uses the term "between" inconsistent with the preliminary construction of the institution decision, the PTAB should apply the broader definition "in intermediate relation to" when construing the meaning of the term. As explained above, this broader usage of the term "between" is consistent with the manner in which the term "between" is used and understood in connection

with Nuhn's patent figures, the '835 Patent substitute claims, Nuhn's pending continuation claims, and the references cited on the face of the '708 Patent. A POSA would not have understood that the term "between" requires that the object be positioned "in the space that separates." Nuhn's expert agrees.

B. "Liquid Manure Pump"

56. Nuhn does not address what a POSA would understand to be the plain and ordinary meaning of this term in its Patent Owner's Response. Rather, Nuhn relies on its expert's declaration on this point. Nuhn's expert's claim construction discussion of "liquid manure" and "liquid manure pump" appears to be a nearly a copy-and-paste of the discussion corresponding to the "fluid pump for pumping liquid manure" and "liquid manure" claim construction sections found in its expert's '425 Patent IPR declaration (albeit with updated patent numbers and exhibit numbers). *Compare* EX2099, ¶¶[0071]-[0098] *with* IPR2023-01161, EX2029, ¶¶[0069]-[0095], [0099]. As discussed in detail in my reply declaration in the '425 Patent IPR (IPR2023-01161, EX1112, ¶¶35-47), I disagree with Mr. Prairie's arguments on these terms. For convenience, I have reproduced my analysis of that issue below.

57. Based on Mr. Prairie's reproduction of the same argument for the terms "fluid pump for pumping liquid manure" and "liquid manure pump[,]" it appears that Nuhn and Mr. Prairie do not dispute that these terms should be construed

consistently with each other. As discussed in the PTAB’s institution decisions on the ’425 Patent and the ’835 Patent, these terms are properly considered to cover “a pump with a structure capable of pumping liquids with suspended solids.”

i. Nuhn and Its Expert Admit that “Liquid Manure” Includes Low Solid Content Forms of Manure.

58. Nuhn focuses many of its arguments on manure storage pits containing heavy crust. While such pits may be one extreme use case for Nuhn’s commercial product, these pits are the exception—they do not represent liquid manure lagoons. The ’708 Patent distinguishes between these “smaller pits” ((EX1001, 1:44) containing higher solid contents manure) and “large lagoons” (*id.*, 1:49) containing lower solid contents liquid manure), noting that low solid content “liquid manure [is] ... contained in a farm lagoon” and is “irrigate[d] onto farm land[.]” *Id.*, 1:28-31; EX1032, 1:14-17. And Nuhn’s own evidence states that “crusts do not occur on pig slurry stores[.]” EX2102 at 6. This is also acknowledged by Mr. Prairie and Mr. Sundstrom. EX1095, 82:25-83:9; EX1100, ¶6. And the ’708 Patent, which is directed to “hog and cattle manure,” notes that “during storage, a crust *can* develop[.]” EX1001, 1:35-40 (emphasis added). The term “liquid manure” is broad enough to include manure without crusts and is distinguishable from high solid content pits cited by Nuhn in its Response. EX1051, 76 (describing typical solid contents levels in pits versus lagoons); EX1141, 5 (same).

59. “Liquid manure” is understood in the literature as a mixture of water and manure with a total solid content of less than about 5%. EX1063, 89; 1061, 11-13 (“The solids content of slurry ranges from about 5 to 15 percent ... Liquid manure has solids content of 5 percent or less. This consistency generally is produced where manure is diluted by wash water....”); EX1059, 13 (“Wastes 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.”); EX1041, 2; EX1042, 2. While Nuhn and its expert claim that there should be no upper limit to the solid content of liquid manure (*see* EX1095, 186:14-24), Nuhn does not (and can not) dispute that even under its own construction, “liquid manure” includes those lagoons containing “a mixture of water and manure with a total solid content of less than about 5%.” The inventor, Ian Nuhn, and Mr. Prairie conceded as much in their depositions. *See* EX1098, 256:10-15; EX1095, 184:14-186:24. As acknowledged by the ’708 Patent, the literature is clear that “manures with less than approximately 4% total solids can be pumped from earthen basins or lagoons using pumps designed for conventional water irrigation.” EX1037, 64; *see* EX1039, 5; EX1051, 80; EX1032, 1:14-17. Thus, a POSA would have understood that a “fluid pump for pumping liquid manure” would cover pumps capable of pumping high volumes of water from lakes and streams, which at least are capable of pumping such low solid content forms of liquid manure.

ii. Mr. Prairie's Arguments Concerning Liquid Manure Are Wrong.

60. Mr. Prairie contends that my positions do not account for pre-agitation characteristics of liquid manure or the crust on lagoons. EX2099, ¶69. He is wrong. As a preliminary matter, the claims of the asserted patent say nothing about pre versus post agitation liquid manure. Rather, the claims merely require “a fluid pump for pumping liquid manure.” Regardless of the specific construction that is employed, “liquid manure” would cover the pre-agitation contents of a lagoon as well as the post-agitation contents of a lagoon. Given that the pre-agitation supernatant would have a lower solids content than the post-agitation mixture, a POSA would have understood that a pump capable of pumping a post-agitation mixture would also be capable of pumping the pre-agitation supernatant against the other layers of the lagoon, as has long been done in the liquid manure handling industry. *See supra* Section IV.

61. Mr. Prairie also notes that the US Department of Agriculture's Animal Waste Management Field Handbook (“AWMFH”), one of the references relied upon for my opinions related to the solids content of liquid manure (EX1059), also provides that these ranges “must be considered generalizations subject to variation and interpretation.” EX2099, ¶73. This point is fully consistent with my opinion. A POSA would have understood that some variability exists and that different sources

define liquid manure in slightly different ways. For example, one reference may generalize that liquid manure contains 4% or less total solids while another provides a range of 5% or less total solids. EX1037, 64; EX1059, 13. Similarly, a POSA would have understood that the range of solids concentration considered liquid may vary somewhat from one source animal to another. EX1061, 12. The proper construction of liquid manure specifically accounts for any such variation by including the phrase “less than *about* five percent.” This construction is consistent with the literature, which recognizes that liquid manure is the form of manure that is able to be pumped from lagoons using irrigation pumps. *See, e.g.*, EX1037, 64 (“[M]anures with less than *approximately* 4% total solids can be pumped from earthen basins or lagoons using pumps designed for conventional water irrigation.”) (emphasis added); *see* EX1039, 5; EX1051, 80; EX1100, ¶15; EX1099, ¶¶6-7.

62. Regarding the solids content of liquid manure, Mr. Prairie testified that “[l]ow can be all the way to zero. It would be none. And high – there is no high in a high threshold. So I can give you a low-end threshold. I can’t really give you a high-end threshold.” EX1095, 186:20-24. As support for this position, Mr. Prairie testified

that the patent¹ “does not state a certain percentage.” EX1095, 187:16-17. Under Mr. Prairie’s seemingly boundless construction, liquid manure could be quite literally anything and could contain any concentration of solids, including 100% solids content. This is incorrect. At any rate, Mr. Prairie’s testimony concedes that liquid manure would include a mixture of water and manure with a total solid content of less than about 5%.

63. Mr. Prairie’s overly broad and unrealistic construction of liquid manure is wrong because it is inconsistent with what a POSA would have understood. Mr. Prairie’s reliance on the fact that the ’708 Patent does not “state a certain percentage” is misleading because a POSA would have been familiar with various forms of manure and would have a general understanding of their characteristics and their range of solids concentrations. A POSA reading the ’708 Patent would not have understood the ’708 Patent to redefine the term “liquid manure” or ascribe a new and different meaning from what was generally understood in the industry. A POSA would have understood that liquid manure would behave differently than other forms of manure and accordingly would have a different range of solids content. Mr. Prairie

¹ While Mr. Prairie was discussing the ’425 Patent, the ’708 Patent shares a common specification with the ’425 Patent. These statements are equally attributable to the ’708 Patent.

even agrees that solid manure and liquid manure are different and conceded in his deposition that “[s]olid manure has different characteristics than liquid manure.” EX1095, 155:13-14.

64. Mr. Prairie contends, incorrectly, that a POSA would not have understood the solids concentration of a typical manure lagoon to be a few percent or less. EX2099, ¶77. But Mr. Prairie does not provide a single citation to any study that actually reports the solids concentrations found in typical manure lagoons. Despite his statements asserting that the sole purpose of the claimed invention is for manure lagoon agitation/pumping, Mr. Prairie summarily ignores available technical references that would have informed a POSA as to the typical solids concentration found in liquid manure in liquid manure lagoons. EX1051, 76; EX1141, 5.

65. Mr. Prairie instead cites other patents, alleging that these patents use liquid manure broadly to refer to the contents of lagoons. EX2099, ¶78. Mr. Prairie is wrong. He provides no citations that would support his position that solids, trees, and six-foot-thick crusts are all liquids. Some of these references do not even use the term “liquid manure” and instead describe manure handling technology for manure storage systems that have higher solid manure contents. *See* EX2003; EX2010; EX2018. Those references that do describe liquid manure handling technology say nothing about the percentages of total solids found within a liquid manure lagoon. *See* EX2013; EX2014; EX2015; EX2016; EX2017. In sum, Mr. Prairie’s

conclusions are unsupported by the evidence and misrepresent what a POSA would have understood from the teachings of the intrinsic and extrinsic evidence.

66. Citing *Natural Crusting of Slurry Storage As An Abatement Measure for Ammonia Emissions on Dairy Farms*, Mr. Prairie contends that crusts can be colonized by vegetation including small trees. EX2099, ¶84. Mr. Prairie’s reliance on this reference and his conclusion is incorrect. Obviously, small trees are not growing on the liquid manure or on the suspended solids in liquid manure; they are growing on a solid crust, which is neither liquid nor liquid manure. It is crust. It is equally hard to imagine a POSA would have considered small trees to be “liquid” or “liquid manure.” Mr. Prairie provides no such reference to support his position that the suspended solids found in liquid manure would include small trees. Such small trees would not be “pumpable” for any type of liquid manure pumping system, including the pumping system disclosed in the ’708 Patent. Furthermore, this very same reference acknowledges that “crusts do not occur on pig slurry stores[.]” EX2102 at 6. Mr. Prairie’s assertions that liquid manure always includes a crust are contradicted by his own cited evidence.

VII. GROUND 1: CLAIM 23 IS ANTICIPATED BY BENNETT-II

67. Bennett-II anticipates claim 23 of the ’708 Patent because Bennett-II discloses a remote-control amphibious vehicle with foam filled buoyant elements

between the wheels. Nuhn and Mr. Prairie contend that claim 23 is not anticipated by Bennett-II. As explained herein, they are wrong.

A. Independent Claim 23

[23.0] An amphibious vehicle comprising:

[23.1] a floatable vehicle body comprising buoyant elements having foam filled buoyant chambers, the buoyant elements comprising a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front wheel and a second rear wheel;²

[23.2] a ground engaging propulsion structure;;

[23.3] a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in a liquid manure lagoon; and,

[23.4] a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the liquid manure mover; and,

[23.5] a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.

² The '708 Patent claims include several typographical errors that were addressed in a certificate of correction dated January 3, 2023. For clarity, I have reproduced the corrected language in this declaration.

68. Nuhn and Mr. Prairie assert that Claim 23 is not anticipated by Bennett-II, at least because Bennett-II does not: (1) disclose wheels; (2) disclose buoyant elements situated between the wheels. Paper 21 at 8-13; EX2099, ¶¶134-145. Nuhn and Mr. Prairie are wrong on each of these points. Bennett-II discloses every element of claim 23.

i. Bennett-II Discloses Wheels.

69. Bennett-II teaches front and rear “load wheels 75” arranged on each side of the vehicle. EX1017, ¶¶[0062]-[0064]. Nuhn argues that the load wheels of Bennett-II are not the same as the wheels described in the ’708 Patent. Paper 21 at 8. However, aside from asserting that “Bennett-II discloses a vehicle with tracks members 12, 14” and that “[t]racks are not wheels” (*id.* at 8-9), Nuhn provides no basis for why the wheels disclosed in Bennett-II are somehow different and would not meet the limitation of the wheels in claim 23. A POSA would have understood that Bennett-II includes wheels furthest forward, i.e. front wheels, and wheels furthest rearward, i.e. rear wheels. For example, Bennett-II teaches that “[l]oad wheels 75 include a front load wheel 75a and a rear load wheel 75b and are configured to support the majority of the load of the vehicle.” EX1017, 5:1-3.

70. As recognized in the Institution Decision, claim 23 separately recites the ground engaging propulsion structure and the wheels—it does not require that the wheels be the ground engaging propulsion structure. Paper 10 at 47. While Nuhn

and Mr. Prairie cite to a section of the '708 Patent that discusses how the *ground engaging propulsion structure may comprise* a track or wheels, that section of the '708 Patent is irrelevant because it describes components of the ground engaging propulsion structure. In contrast, the wheels of claim 23 are not described as being the ground engaging propulsion structure. Rather, claim 23 only recites a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front wheel and a second rear wheel. Regardless, a POSA would have understood from the explicit teachings of Bennett-II that the ground engaging propulsion structure on that vehicle comprises wheels.

ii. Bennett-II Discloses Buoyant Elements Between a First Front Wheel and a First Rear Wheel and a Second Buoyant Element Between a Second Front Wheel and a Second Rear Wheel.”

71. Nuhn argues that because the buoyant chambers of Bennett-II are located inside the vehicle body and the wheels are outside the vehicle body, that the buoyant chambers cannot be between the load wheels. Nuhn is wrong. Claim 23 says nothing about whether the buoyant elements are located inside versus outside of the vehicle body. Bennett-II teaches that the “frame assembly 30 and/or tub 40 may include ... foam material inserts in order to fill volume voids and resist water ingestion during amphibious operation.” EX1017, ¶[0051]. A POSA would have understood that the frame and tub assembly volume voids would be filled with foam

to provide buoyancy. A POSA would also have understood that the foam filled frame and tub are positioned between the left front wheel and right rear wheel of Bennett-II and are positioned between the right front wheel and left rear wheel of Bennett-II, thus meeting the limitations of claim 23. In addition, I understand that the PTAB rejected Nuhn's remaining arguments about what side of the vehicle the first and second wheels are arranged in the institution decision. Paper 10 at 12-13. Because Bennett-II discloses buoyant elements at least between the front left wheel and rear right wheel, as well as the front right wheel and rear left wheel, Bennett-II anticipates claim 23.

iii. Bennett-II Discloses Foam Filled Buoyant Chambers.

72. I understand that Nuhn disputes whether the chambers of Bennett-II are foam filled. Nuhn suggests that a "statement about filling holes in Bennett-II's tub 40 for watertightness does not teach two separate foam filled buoyant chambers inside the tub." Paper 21 at 10. Nuhn is incorrect. Bennett-II discloses that the "frame assembly 30 and/or tub 40 may include ... foam material inserts in order to fill volume voids." EX1017, ¶[0051]. Bennett-II describes that the "frame assembly 30 includes ... cross members 34." EX1017, ¶[0050]. The spaces in between the cross members 34 of the frame assembly 30 are volume voids and would therefore be properly understood to include the foam material inserts, as described by Bennett-II.

73. In its institution decision, the PTAB encouraged the parties to “address the meaning of ‘chamber’....” Paper 10 at 47. I understand that the ’708 Patent does not provide any independent definition of the term “chamber.” It is my opinion that a POSA would have recognized the spaces shown in Bennett-II, annotated in green and blue below, to be properly understood as “chambers.” This is because the dictionary definition cited in the institution decision recognizes that a “chamber” is an “*artificial* enclosed space or *cavity*.” EX3003, 1 (emphasis added). That same dictionary recognizes the definition of “cavity” as being “an unfilled space within a mass.” EX1123, 1. The spaces between the cross members 34 are spaces within the mass of the tub 40. Nuhn does not dispute that the spaces shown in green and blue are properly understood as chambers, but rather argues that these spaces are inside the tub and not “situated between” the track driving wheels, based on the previously rejected argument that claim 23 requires the first front wheel and the first rear wheel be positioned on the same (right or left) side of the vehicle. Paper 21 at 12.



VIII. GROUND 2: CLAIMS 1, 8-18, 21-28, AND 35-38 ARE RENDERED OBVIOUS BY TRUXOR IN VIEW OF YOON OR CARRIER

75. As described herein, Nuhn's and Mr. Prairie's conclusions that Truxor combined with Yoon or Carrier would not render claims 1, 8-18, 21-28, and 35-38 of the '708 Patent obvious are wrong.

A. Truxor Renders Obvious Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle.

76. Nuhn argues that when substituting the Truxor tracks for wheels, a POSA would jettison the Truxor pontoons. Paper 21 at 29-30. For this reason, Nuhn argues that Truxor fails to render obvious elements [17.3], [21.1]-[21.2], and [23.1]. As explained below, Nuhn is wrong. These claim elements are reproduced below:

[17.3] a floatable vehicle body comprising a first buoyant element situated between the first front wheel and the first rear wheel and a second buoyant element between the second front wheel and the second rear wheel;

[21.1] a floatable vehicle body comprising a first buoyant element on a first side of the vehicle body and a second buoyant element on a second side of the vehicle body;

[21.2] a ground engaging propulsion structure comprising a first front wheel, a second front wheel, a first rear wheel, and a second rear wheel, wherein the first front wheel and the first rear wheel are on the first side of the vehicle body and the second front wheel and the second rear wheel are on the second side of the vehicle body, and wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;

[23.1] a floatable vehicle body comprising buoyant elements having foam filled buoyant chambers, the buoyant elements comprising a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front wheel and a second rear wheel;

77. Nuhn is wrong for several reasons. First, a POSA would not have been motivated to jettison the Truxor pontoons. A POSA would have understood that the pontoons are the elements which produce a buoyant force on the vehicle and thus allow it to float when traveling on water. Removing the pontoons would render the vehicle unable to stay afloat and render it incapable of amphibious operations.

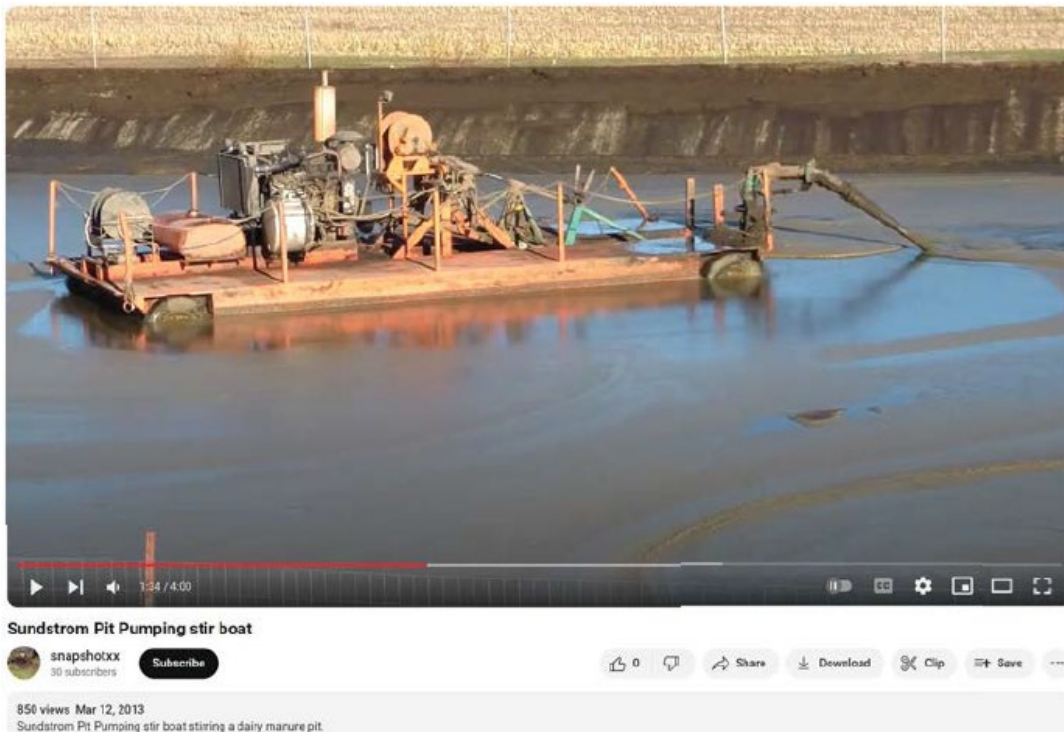
78. Instead, when substituting tracks for wheels, a POSA would have been motivated to keep the pontoons which are necessary for floatation. As pictured below, a POSA would have recognized that the shape of the pontoons could be modified to accommodate wheels powered by the hydraulic motors located at the front and rear ends on each side of the vehicle.



79. In addition to preserving the vehicle's flotation capabilities, a POSA would have understood that such a modification would be advantageous because it

would allow for the vehicle to be transported via a trailer on a highway or road. *See* EX1006, 15 (depicting the Truxor vehicle loaded on a trailer for transportation). Specifically, this arrangement allows for the overall width of the vehicle to be sized to accommodate highway transport while keeping both the ground-engaging wheels and the buoyant pontoons toward the outboard edges of the vehicle, thereby rendering the vehicle more stable on both land and water.

80. A POSA would have understood this modification to be trivial based on the available prior art, which included the Sundstrom Stir Boat, which had the same arrangement of buoyant elements with respect to the wheels.



EX1100, ¶¶7, 11-13.

81. Similarly, a number of other pre-2013 amphibious vehicles utilized cutouts in the buoyant hulls of the vehicle with buoyant elements arranged between vehicle wheels. *See, e.g.*, EX1119, 1; EX1120, 1; EX1121, 7. Such arrangements were even used on amphibious duck boats since as early as 1942. EX1121, 7.



EX1119, 1.



EX1120, 1

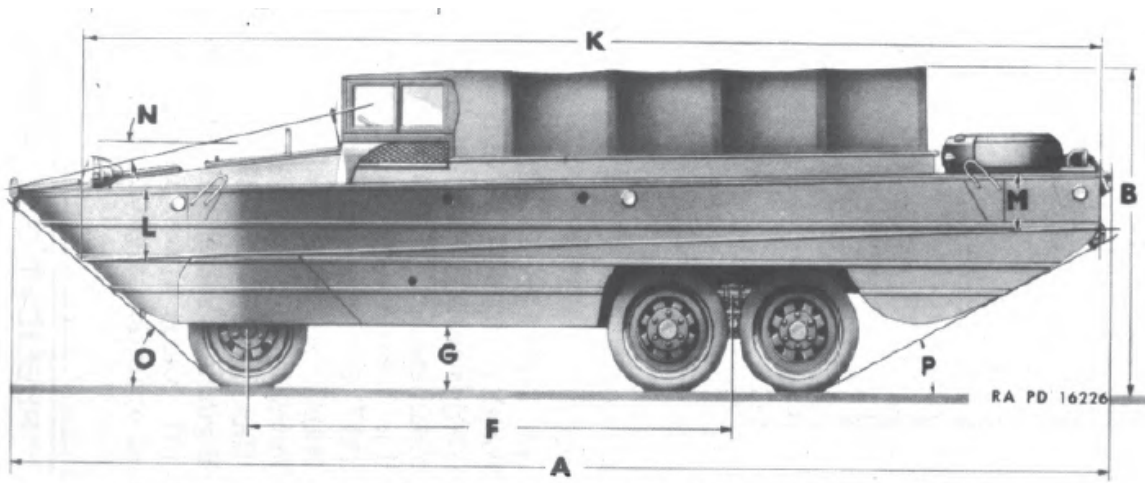


Figure 2—Front and Side View of Vehicle Showing Dimensions .

EX1121, 7.

82. Nuhn argues that a POSA would have instead looked to the teachings of SenwaTec and installed auxiliary pontoons outboard of the vehicle wheels. While such auxiliary pontoons may have some advantages, a POSA would have understood that such a configuration would also have certain design trade-offs, such as additional setup and takedown time when loading the vehicle for transport, introducing additional complexity and failure modes, and having the potential to become caught on surrounding debris during operation. Thus, in light of these design trade-offs, when considering these two options practiced by the prior art, a POSA would have understood that the arrangement taught by the Sundstrom Stir Boat would have provided predictable results and a reasonable expectation of success, and fewer potential drawbacks.

83. And regardless, when evaluated under the proper construction of “between,” a POSA would have understood that the logical location for stabilizer pontoons arranged outboard of the wheels as taught by SenwaTec, would be to arrange at least a portion of each pontoon in intermediate relation to the front and rear wheel on each side of the vehicle. *Supra* Section IX.A.

B. Truxor Discloses a Dredging Pump Capable of Pumping Liquid Manure.

84. Nuhn and Mr. Prairie allege that Truxor does not render obvious claims 1, 17, and 21 because Truxor’s Doro Pump does not meet the “liquid manure pump” limitations and generally suggest that the dredge pump of Truxor would be incapable of pumping liquid manure. Paper 21 at 25-; *see also* EX2099, ¶¶147-156. This is incorrect because Truxor clearly teaches that the Doro Pump is capable of pumping liquid containing suspended solids. EX1006, 10. I understand that this was confirmed by the testimony of Mr. Olofsson, the designer of the Truxor Doro Pump. *See* EX1110, 104:19-107:1. For conciseness, I have not reproduced the language of claims 1, 17, and 21 here, however, that claim language is reproduced in my previous declaration. *See* EX1004, Sections VIII.B, J, and L.

85. Again, in an effort to support these conclusions, Nuhn and Mr. Prairie rely on their proposed criteria that a POSA would only consider a pump to be liquid manure pump if it were designed, marketed, and/or tested and validated for liquid

manure pumping applications. Paper 21 at 25-26. However, POSA would not rely on these arbitrary and subjective criteria to determine whether a pump was capable of pumping liquid manure. Nuhn and Mr. Prairie also claim that Truxor would be incapable of pumping liquid manure because: (1) the Doro Pump is not heavy duty and (2) manure exhibits non-Newtonian characteristics. Paper 21 at 26. They are again wrong on both points.

86. First, regarding the topic of “light duty” or “heavy duty” dredges, Nuhn attempts to create an arbitrary distinction between Truxor and other dredging pump systems (discussed in EX1055, EX1075, and EX1076) that have long been used to pump higher solid content forms of manure. But Truxor does not describe itself as “light duty.” Nuhn and Mr. Prairie have not provided any evidence supporting the distinction between Truxor and other dredge pumps which they term “heavy duty.” Regardless, a POSA would have understood that the dredge pump of Truxor, and pumps generally, could be scaled up or down in size and power requirements that would accommodate any alleged difficulty in pumping liquid manure.

87. A POSA would have understood that the primary function of a dredge pump such as the Doro Pump is to transport solid materials, oftentimes sediments, stones, and other materials often found at the bottom of a reservoir. A POSA would have understood that dredge pumps were known in the art for pumping and removing the heavier sediment layers (“sludge”) found at the bottom of liquid manure lagoons.

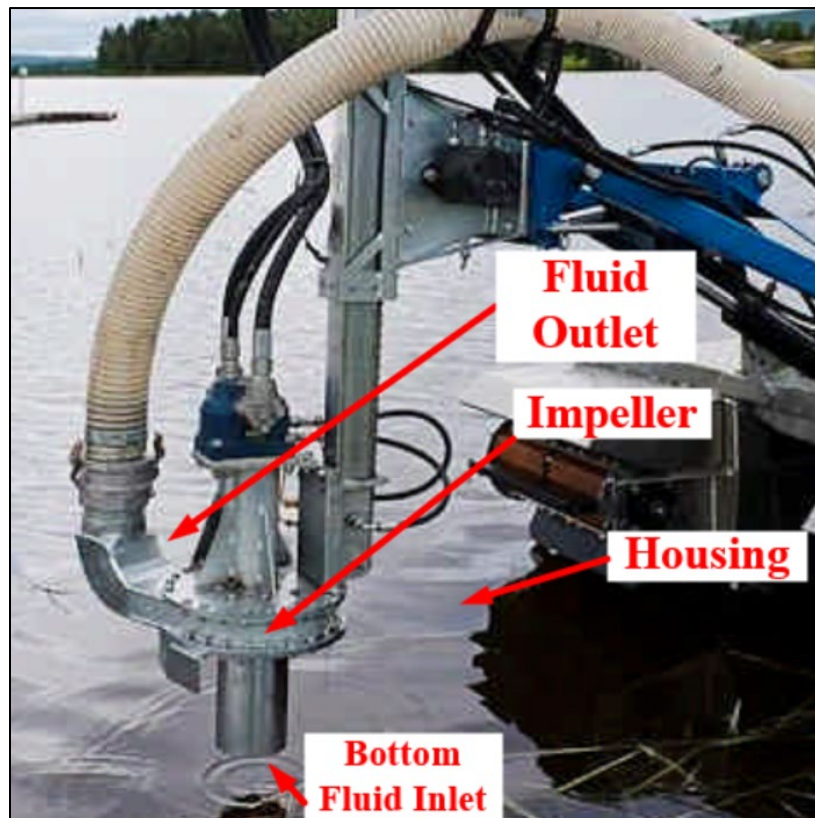
EX1040, 3; EX1055, 2; EX1063, 64; EX1075, 1; EX1076, 4-5. Furthermore, as confirmed by Mr. Olofsson, the designer of the Doro Pump, the Doro Pump was capable of pumping fluids with suspended solids of up to approximately thirty percent. EX1110, 104:19-107:1. The requirements for pumping the contents of liquid manure lagoons are much less and well within the capabilities of the Doro Pump, because the solids content of manure lagoons is typically much lower, on the order of a few percent or less solids. *Supra* Section VI.B. Nuhn's arguments that a dredge pump designed for pumping high concentrations of solids would somehow be incapable of pumping lower solids content liquid manure found in a manure lagoon is nonsensical. Therefore, a POSA would have understood that the Doro Pump would be capable of pumping liquid manure, in addition to higher solid content forms of manure. *See id.*

88. Further, as shown below, the Doro Pump includes many of the same structural characteristics as described in U.S. Patent No. 4,406,413 to Houle (EX2010), a manure pump relied on extensively by Nuhn and Mr. Prairie, and which is capable of pumping liquid manure.

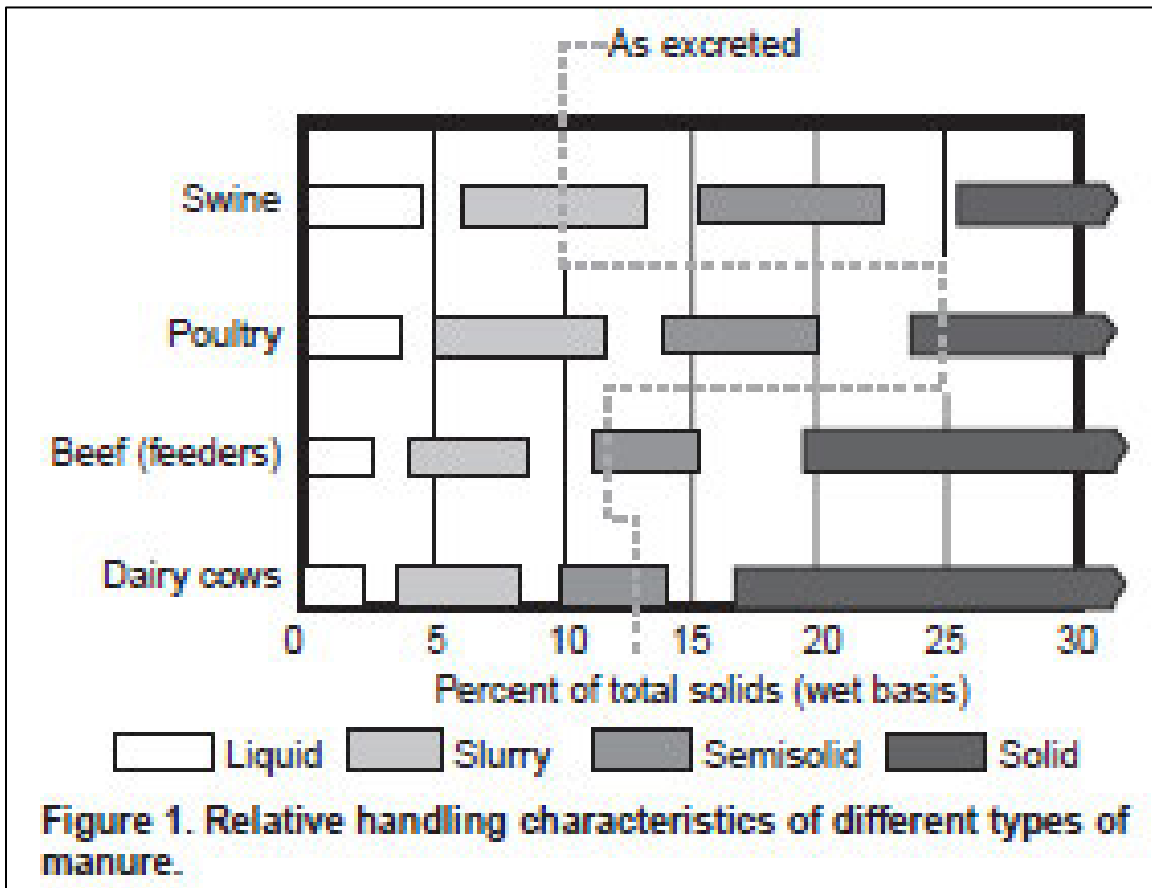
89. A POSA would have also understood that the Doro Pump is a centrifugal pump based on its geometry. A POSA would have understood that such centrifugal pumps include a spinning impeller inside a housing. A POSA would have understood that the Doro Pump includes a bottom fluid inlet that draws fluid into the

pump housing through an inlet, and that the spinning impeller accelerates the fluid, moving it from the inlet toward the outer edge of the pump where it is discharged through a fluid outlet. A POSA would have understood that, as illustrated in the annotated image below, the Doro Pump includes a bottom fluid inlet, a fluid outlet, an impeller, and a housing. A POSA would have understood that the Doro Pump impeller would be located within the housing of the pump above the bottom fluid inlet and adjacent to the fluid outlet.

90. A POSA would have further understood that the Doro Pump is configured to be immersed in the fluid reservoir from which it is pumping and is configured to be submerged while the Truxor vehicle is floating.



92. Second, Nuhn and Mr. Prairie also assert, without support, that liquid manure has high total solids content and behaves like a non-Newtonian fluid. EX2099, ¶155. This is wrong. It is not what a POSA would have understood about the characteristics of liquid manure. As illustrated in the diagram below, a POSA would have understood that “liquid manure” is a form of manure that contains the lowest solids content, rather than “high total solids” as Mr. Prairie asserts without support. EX1038, 2. Further, a POSA would have understood that the solids concentration of liquid manures found in typical manure lagoons is oftentimes a few percent or less. *Id.*, 5; EX1051, 76; EX1037, 50. As described in the literature, liquid manure (which has less than approximately 5% solids) exhibit qualities very much like water (i.e. having Newtonian fluid behaviors). EX1059, 13. This is why liquid manures were pumped with conventional water and irrigation pumps.



EX1038, 2.

93. A POSA would have understood that some higher concentrations of manure exhibit non-Newtonian behaviors, specifically shear-thinning characteristics. *See, e.g.,* EX2097, 8. A POSA would have understood that non-Newtonian behavior begins to manifest at higher solids concentrations, higher than the few percent or less solids that are typically found in liquid manures contained in manure lagoons. For example, in a study involving manure from lactating cows and samples taken from a manure storage tank containing bedding, urine, fresh and old manure, and water, Kumar reports that “[w]hen the slurry was below five percent

total solids, it showed Newtonian flow properties, and above six percent it showed non-Newtonian (pseudo-plastic) flow properties.” EX1129, 3. Kumar concludes that “the flow is Newtonian at low total solids content (below five percent).” *Id.*, 5. A POSA would have understood that the typical concentration in a manure lagoon is a few percent or less, below the typical concentration where non-Newtonian characteristics are exhibited. EX1051, 76; EX1129, 5.

94. Regardless, Nuhn and Mr. Prairie have not provided any evidence that the Doro Pump could not pump liquid manure, non-Newtonian fluids, or fluid with suspended solids. The Doro Pump is a dredge pump that is specifically designed for pumping liquids with suspended solids. EX1006, 10. Further, a POSA would have understood that centrifugal pumps were capable of pumping manure that exhibit non-Newtonian characteristics, as centrifugal pumps were reported as acceptable for pumping forms of manure having as high as 10-12% total solids. EX1037, 52.

95. Higher concentrations of manure are known to exhibit pseudo-plastic (“shear-thinning”) behavior, which a POSA would have understood to mean that as the shear-rate of the fluid increases, the viscosity drops. EX1129, 3. A POSA would have understood that a reduction in viscosity, as is the case when pumping a shear-thinning fluid, would facilitate more efficient pumping rather than prevent it, as Mr. Prairie incorrectly asserts. *Id.* Furthermore, a POSA would have understood that “sand-laden manure ... approaches Newtonian fluid when concentration decreases.”

EX1131, 1. Thus, a POSA would have understood that at low concentrations of solids (in the liquid manure range), manure behaves like a Newtonian fluid (i.e. water).

96. Finally, Nuhn and Mr. Prairie both ignore that regardless of its construction, the term “liquid manure” includes mixtures of water and manure that are approximately 4-5% or less in total solid content. As described in the literature, “[l]iquid manures with less than approximately 4% total solids can be pumped from earthen basins or lagoons using pumps designed for conventional water irrigation.” EX1037, 64. Therefore, a POSA would have understood that the Doro Pump, which is capable of pumping much higher solid content mixtures, would have also been capable of pumping at least these lower solids content (<4-5%) forms of liquid manure.

97. Nuhn’s and Mr. Prairie’s arguments are conclusory, generally unsupported, and wholly inconsistent with what a POSA would have understood about dredging pumps and dredge vehicles, liquid manure, the Newtonian behavior of liquid manures, and the ability of centrifugal pumps to pump non-Newtonian fluids. For the reasons described herein, a POSA would have understood that the Truxor vehicle with the Doro Pump was capable of pumping liquid manure.

C. The Combination of Truxor and Yoon or Carrier Discloses the Remote-Control Limitations of the Claims. A POSA Would Have Been Motivated to Combine Truxor and Carrier or Yoon with a Reasonable Expectation of Success.

98. Nuhn argues that claims 1, 17, 21 and 23 are not rendered obvious by the combination of Truxor and the remote-control system of Yoon or Carrier because of perceived difficulties in combining Truxor with the remote-control teachings of Yoon or Carrier. Paper 21 at 35-36.

99. As described in my prior declaration, the motivations to combine and expectation of success in combining Truxor with Yoon or Carrier are substantially similar to the motivations to combine SenwaTec with Yoon or Carrier. EX1004, Section VIII.A, ¶236. For this reason, I address both of these references below.

100. Neither Nuhn nor Mr. Prairie provide any analysis refuting my opinion that a POSA would have been motivated to improve the overall safety of the vehicle by adding remote control to the Truxor vehicle. As recognized by Melnikov, removing an operator from the vehicle would improve the safety of operating the vehicle. EX1027; EX1028, 4. As discussed in my prior declaration, it is my opinion that a POSA would have had a motivation to combine Truxor and Yoon or Carrier and would have had a reasonable expectation of success in doing so. EX1004, Section VIII.A. This is further supported by the testimony of Mr. Olofsson, the

designer of the Truxor DM5000, who testified that remote control was in fact added to the Truxor DM5000 vehicle prior to 2013. EX1110, 109:14-133:9.

101. Mr. Prairie and Nuhn's suggestion that there would have been no motivation to combine Truxor with Yoon or Carrier (*see* EX2099, ¶131) is incorrect and unsupported by the evidence. Mr. Prairie contends that the Truxor and SenwaTec vehicles: (1) are not capable of pumping liquid manure, (2) are not heavy enough to break through crust, (3) would not provide a remote operator with a line of sight, and (4) have hydraulic controls that could not be remotely controlled. Each of these arguments are demonstrably wrong and counter to the evidence. *Id.*, ¶¶111-114, 128-131, 177, 221.

102. Contrary to Mr. Prairie's assertions, a POSA would have understood that the pumps of Truxor and SenwaTec are capable of pumping liquid manure. A POSA considering the teachings of Truxor and SenwaTec would have understood that both vehicles were capable of producing strong streams of fluid with their pumps, which are discharged through nozzles. A POSA would have understood that these jets of fluid could be used to agitate liquid manure. If a crust were present on top of the liquid storage reservoir, a POSA would have further understood that the jets of fluid created by the Truxor or SenwaTec vehicle could be utilized to break up the crust. However, more importantly, a POSA would have understood that these are not limitations of the '708 Patent claims, and that breaking up "crust" is not a

requirement for a liquid manure pump / liquid manure mover to pump liquid manure. Mr. Prairie's arguments miss the mark.

103. Mr. Prairie implies that the pumps of Truxor and SenwaTec would not be sufficiently powerful for pumping liquid manure. EX2099, ¶129. However, as described below, dredging pumps such as the pumps of Truxor and SenwaTec have long been used to pump liquid manure and suspended solids. *See supra* Section VIII.B; *see infra* Section IX.B. SenwaTec teaches that the “powerful centrifugal pump” can deliver “40 kW of pumping power.” EX1012, 1. A POSA would have understood that 40 kW is more than 53 horsepower, which would be more than sufficient to provide pumping and agitation capabilities. The Truxor vehicle is also described as being equipped with a “Daihatsu 35 hp diesel” engine. EX1006, 3. Mr. Prairie's suggestions that the power and flow rates from the Truxor and SenwaTec vehicles are somehow inadequate for pumping and agitation are without basis. Mr. Prairie's characterizations as low-power and low flow-rate are qualitative, arbitrary, and contrary to the explicit teachings in Truxor and SenwaTec.

104. Second, Mr. Prairie implies that Truxor and SenwaTec do not weigh enough to break through the crust and would simply drive across the surface of lagoon. This opinion is unsupported by the evidence. The '708 Patent does not provide any discussion of vehicle weight, nor does it provide specific requirements for the vehicle weight or other characteristics required to break through the crust on

a manure lagoon, which is not a limitation of the '708 Patent claims. A POSA would have understood that the Truxor vehicle weighs approximately 1380 kg (3042 lbs.) (EX1006, 3) and that the SenwaTec vehicle weighs approximately 2480 kg (5500 lbs.) (EX1012, 1). A POSA would have understood that a crust may not even be present, and even in instances where a crust does exist, Mr. Prairie testified that a “crust can be a thin layer of liquid.” EX1095, 87:15-25. A POSA would have understood that the Truxor and SenwaTec vehicles, weighing thousands of pounds, would not simply drive across the top of a manure lagoon on top of a crust that may not even exist or a crust that is comprised of a “thin layer of liquid.”

105. Third, related to the application of remote control to the Truxor and SenwaTec vehicles, Mr. Prairie alleges that a POSA would not have modified Truxor or SenwaTec to use remote control systems because they would need a “line of sight of the terrain ahead of and around the vehicle.” EX2099, ¶131. Mr. Prairie is wrong because he fails to consider that a line of sight of the vehicle could be achieved by standing onshore in view of the remotely controlled vehicle, as is typically the case with any remotely controlled vehicle. *See* EX1110, 109:14-133:9 (remote control added to Truxor DM5000); EX1109, 28:2-9 (remote control added to Amphi-King sold in China). Any remotely controlled vehicle provides the operator with a different vantage point relative to being onboard the vehicle, and in many instances will allow the operator to position themselves in a better position to observe the

vehicle than if there were positioned therein. As shown in the SenwaTec video (EX1031), a POSA would have understood that line of sight, sufficient to control the vehicle and observe its attachments, like the pump of Truxor, would be afforded to an operator standing on the banks of the reservoir, for example, in the area shown below.



EX1031, 5:09 (annotated).

106. Nuhn and Mr. Prairie offer no analysis to support their position that getting stuck, rolling, and tipping would be more likely to occur if the Truxor or SenwaTec vehicles were equipped with remote controls. Even if this were the case, Mr. Prairie does not refute the fact that using such systems would increase the safety of the operator and does not refute the benefits this would provide. Regardless, even if there are tradeoffs between an on-board operator and a remote operator, none of

these arguments negate the clear safety benefits that are afforded by remote operation of these vehicles. Aside from Mr. Prairie's perceived difficulties or belief that remote control would increase the likelihood of getting stuck or tipping, he provides no rationale as to why remote control could not be added to Truxor or SenwaTec.

107. Fourth, Mr. Prairie alleges that remote control would be difficult to implement with the hydraulic controls of Truxor and SenwaTec. EX2099, ¶¶177, 221, 391, 438. To the extent these difficulties exist, a POSA would have understood that they could be readily overcome. *See* EX1110, 109:14-133:9 (remote control added to Truxor DM5000); EX1109, 28:2-9 (remote control added to Amphi-King). A POSA would have understood that remote control of hydraulic systems was known in the art, including remote control of hydraulic systems on amphibious vehicles and pumping vehicles. For example, Carrier teaches a remotely controlled vehicle that includes wheels that are connected to hydraulic wheel motors and the Carrier vehicle regulates the flow of hydraulic fluid to the hydraulic wheel motors. EX1005, ¶¶[0026], [0064]. In addition, the '708 Patent shows that the use of remote control with hydraulic systems is not as difficult as Mr. Prairie asserts. The '708 Patent provides little or no information related to the structure and configuration of the remote control system, presumably due to its ease of implementation.

108. Contrary to Mr. Prairie’s position, the PTAB concludes that “Patent Owner does not argue, and *we see no reason to believe, that adding remote control to Truxor is not within the ability of one of skill in the art.*” Paper 10 at 24 (emphasis added). The PTAB also provides that “[t]hough Patent Owner identifies these potential drawbacks, *there are almost always tradeoffs to different designs. On the record before us, this does not discredit Petitioner’s reasoning* that adding remote control to Truxor would increase the safety of the operator.” *Id.* (emphasis added).

109. As explained previously (EX1004, ¶¶194-199), a POSA would have been motivated to combine Truxor with the remote-control teachings of Yoon or Carrier and would have had a reasonable likelihood of success. Mr. Prairie’s criticisms and perceived deficiencies with the Truxor and Yoon/Carrier combination are speculative and without basis, and the reasoning behind his arguments is flawed.

110. Mr. Prairie alleges that POSAs would not have been motivated to implement remote control into Truxor because operators would not be able to feel tactile feedback from the machine. EX2099, ¶¶177, 185, 391, 399. However, Mr. Prairie is wrong because regardless of his concerns regarding tactile feedback, a POSA would have understood that remotely controlled vehicles and their functions can be observed from nearby and visual information for a remote operator can be used in place of tactile information for an operator.

111. Mr. Prairie relies on EX2025 to support his opinion that hydraulic excavator controls are not easily converted to teleoperation. EX2099, ¶177, 391. This argument is irrelevant. The '708 Patent claims require remote control, not teleoperation. Moreover, EX2025 does not even mention “teleoperation” or provide any discussion of “remote control” operation. EX2025. A POSA would have understood that EX2025 is a study that uses a simulator of a hydraulic excavator. The study has nothing to do with remote control of any vehicle, let alone an amphibious pumping vehicle.

112. Mr. Prairie cites another document (EX2028) that discusses “tele-remote control of excavators,” which a POSA would have understood to mean that the operator is not even on site and would not be standing onshore with a line of sight to the vehicle and its components. EX2028, 1; EX2099, ¶177. Once again, this document is irrelevant to the issue of remote control of an amphibious pumping vehicle. Mr. Prairie’s conclusions about remote control of the Truxor vehicle, based on a paper related to a unique control system for tele-remote operation of a miniature track excavator, are incorrect and unsupported. EX2099, ¶177. In fact, this same document describes the benefits of remote control, including that “[o]perators no longer have to work onsite in the dangerous health-endagering [sic] construction environment and a flexible deployment of the workforce is possible.” EX2028, 1.

113. Mr. Prairie’s opinion and arguments are further belied by the testimony of the named inventor, Ian Nuhn, who testified that he had little or no education as an engineer. EX1098, 31:21-33:20. Mr. Nuhn also testified that he re-programmed remote-control systems of liquid manure tankers to work on the Lagoon Crawler. *Id.*, 142:9-17. Mr. Nuhn’s testimony illustrates the ease with which remote control systems can be adapted for different control applications.

D. Truxor Discloses the Claimed Combination of Elements.

114. Nuhn and Mr. Prairie assert that the claims of the ’708 Patent specifically relate to a vehicle “disrupting the crust and recirculating liquid manure in a manure lagoon” as well as driving into, out of, and navigating the manure lagoon by wireless control. EX2099, ¶170; Paper 21 at 19. This is contrary to the express language of the ’708 Patent claims. Specifically, the claims of the ’708 Patent do not provide any reference to “crust” or to the function of “disrupting the crust.”

115. In an effort to support this position, Nuhn and Mr. Prairie state that because Truxor describes various other capabilities in addition to dredging, it would not serve as an amphibious manure lagoon pumping/agitation vehicle. EX2099, ¶172. This analysis focuses on other capabilities of Truxor, like reed cutting and gathering, while summarily ignoring the function, purpose, and capabilities of Truxor’s dredge pump, e.g., the Doro Pump. The fact that Truxor is a multi-functional vehicle with other attachments and capabilities is irrelevant to the

question at hand, whether the Doro Pump is capable of pumping liquids with suspended solids. As described herein, a POSA would have understood that the Doro Pump of Truxor would have been capable of pumping liquid manure. *See supra* Section VIII.B.

E. Dependent Claims 8-16, 18, 22, 24-28, and 35-38.

116. Claims 8-15, 18, 22, 24-28, and 35-38 each depend from one of claims 1, 17, 21, or 23. Neither Nuhn nor Mr. Prairie provide any analysis or opinion regarding these claims and obviousness over Truxor in view of Yoon or Carrier, aside from referring back to previous claims from which they depend.

117. As discussed in my prior declaration, it is my opinion that these claims are obvious over Truxor in view of Yoon or Carrier. EX1004, Sections VIII.B-H and VIII.J-O.

118. As for dependent claim 16, while Nuhn and Mr. Prairie do not dispute that the center of gravity of the Truxor vehicle is located along the longitudinal centerline, Nuhn and Mr. Prairie allege that the Truxor vehicle's center of gravity is not located substantially in a middle of the vehicle in the fore-and-aft direction of the vehicle. Claim 16 says nothing about the center of gravity being located substantially in a middle of the vehicle in the *fore-and-aft direction*. Regardless, Truxor discloses that a cockpit located substantially in a middle of the vehicle in the fore-and-aft direction. Furthermore, Truxor discloses a vehicle engine located

immediately behind that cockpit. A POSA would have understood that the weight of the vehicle engine would counter the weight of the pump attached to the lift arm at the front of the Truxor vehicle. Truxor further discloses that the remainder of the components on the vehicle (i.e. pontoons, hydraulic motors, and vehicle body) appear to be located symmetrically along the vehicle in the fore-aft direction. This arrangement of components provides a center of gravity that is generally located substantially in a middle of the vehicle in the fore-and-aft direction. For the purposes of stability on both land and water, a POSA would have understood that a vehicle such as Truxor would be designed to have the center of gravity located substantially in a middle of the vehicle in the fore-and-aft direction. Therefore, even if claim 16 were to require the center of gravity to be located substantially in a middle of the vehicle in the fore-and-aft direction, it is my opinion that claim 16 is obvious over Truxor in view of Yoon or Carrier.

IX. GROUND 3: CLAIMS 1, 8-18, 21-28, AND 35-38 ARE RENDERED OBVIOUS BY SENWATEC IN VIEW OF YOON OR CARRIER

119. Claims 1, 8-18, 21-28, and 35-38 of the '708 Patent are rendered obvious by SenwaTec in view of Yoon or Carrier. SenwaTec renders obvious every limitation of these claims with the exception of the remote-control feature, which were well known to a POSA. POSAs would have been motivated to add remote control features to SenwaTec to improve its overall safety and expand its ability to

operate in dangerous environments and would have a reasonable expectation of success in doing so. EX1004, Section IX.A. A POSA would have understood that SenwaTec discloses a buoyant element in the form of a center wheel positioned in the space that separates the front and rear wheel on each side of the vehicle. A POSA would have further understood, under the proper construction of the term “between” that SenwaTec discloses additional buoyant elements, in the form of stabilizer pontoons, at least a portion of which are positioned in intermediate relation to the front and the rear wheel on each side of the vehicle.

120. As described herein, Nuhn’s and Mr. Prairie’s allegations that SenwaTec combined with Yoon or Carrier would not render claims 1, 8-18, 21-28, and 35-38 obvious are wrong.

A. SenwaTec Renders Obvious Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle.

121. Nuhn argues that SenwaTec lacks buoyant elements positioned between the front wheel and rear wheel on each side of the vehicle. For this reason, Nuhn argues that SenwaTec fails to render obvious elements [17.3], [21.1]-[21.2], and [23.1]. As explained below, Nuhn is wrong. These claim elements are reproduced below:

[17.3] a floatable vehicle body comprising a first buoyant element situated between the first front wheel and the first rear wheel and a second buoyant element between the second front wheel and the second rear wheel;

[21.1] a floatable vehicle body comprising a first buoyant element on a first side of the vehicle body and a second buoyant element on a second side of the vehicle body;

[21.2] a ground engaging propulsion structure comprising a first front wheel, a second front wheel, a first rear wheel, and a second rear wheel, wherein the first front wheel and the first rear wheel are on the first side of the vehicle body and the second front wheel and the second rear wheel are on the second side of the vehicle body, and wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;

[23.1] a floatable vehicle body comprising buoyant elements having foam filled buoyant chambers, the buoyant elements comprising a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front wheel and a second rear wheel;

122. To the extent that “between” is properly interpreted to mean “in intermediate relation to,” SenwaTec teaches floatable stabilizer pontoons, at least a portion of which are located in intermediate relation to the front wheel and the rear wheel on each side of the vehicle.



EX1012, 1 (annotated).

123. To the extent that “between” is restricted to only “in the space that separates,” SenwaTec discloses a middle wheel on each side of the vehicle that is in the space that separates the front wheel and the rear wheel. I understand that Mr. Prairie agreed in his deposition that the middle wheel of the SenwaTec vehicle is between the front wheel and the rear wheel on each side of the SenwaTec vehicle.

EX1094, 200:21-201:2.



EX1012, 1 (annotated).

124. Pre-2013 printed publications illustrate that the SenwaTec wheels with a valve for filling the wheels with air:



EX1031, 1:35 (annotated).

125. A POSA would have understood that air filled tires are commonly used with wheeled vehicles—especially wheeled vehicles advertised as having “low ground pressure” like the SenwaTec Amphi-King. EX1012, 1. Indeed, I understand that Mr. Lonnemann and Mr. Speerschneider confirmed this in their depositions. EX1109, 65:20-67:19; EX1117, 35:15-37:11.

126. A POSA would have understood that air filled wheels are typically buoyant when submerged because they are filled with air which is less dense than water or liquid manure. While other materials used to form the wheels may have a density greater than water, as explained below, based on the images and dimensions of the SenwaTec tires and basic engineering calculations, a POSA would reasonably have understood that the SenwaTec tires would produce a positive buoyancy force. In other words, they float in water.

127. SenwaTec discloses that the tires of the wheels are 36 inches in diameter and 12.6 inches or 16.5 inches in width. EX1012, 3. Based on images of the SenwaTec wheels, the rim diameter appears to be approximately 21 inches. Assuming the tread out and outer tire wall thickness is conservatively 2 inches thick and the side walls are conservatively 1 inch thick, this would leave an annular ring of air with a volume of approximately 4,850 cubic inches or 6,640 cubic inches for the 12.6 or 16.5 inch wide tires, respectively. A reasonable estimate for the

maximum pressure on this type of tire is approximately 14-30 psi, which corresponds to a density of approximately 2.8 kg/m³. EX1124. Compared to air, the density of water is significantly greater, at approximately 1000 kg/m³. EX1125, 1. The buoyancy force generated by the air cavity in the tire can be calculated with the formula below:

$$F_{buoyancy} = V(\rho_{water} - \rho_{air})$$

128. The net buoyancy produced from the volume of air in the SenwaTec tire would be approximately 79 kgf (175 lbs) to 108 kgf (238 lbs) for the 32 cm and 42 cm wide tires, respectively. A POSA would have understood that tires are commonly made from rubber and steel. A conservative estimate is approximately 1/3 of the tire's weight being steel and 2/3 being rubber. EX1126. A POSA would have understood that the density of steel is approximately 7.85 g/cm³ (EX1127) and that the density of the rubber material is approximately 1.1 to 1.2 g/cm³. EX1132, 5-6. The resultant composite density of the tire material would therefore be approximately 2900 to 3100 kg/m³ (approximately three times the density of water). As a result, a POSA would have understood that when submerged, the tire materials (ignoring the air cavity) would produce a negative buoyant force equivalent to 2/3 the weight of the tire. A survey of similarly configured tires used for agricultural purposes indicates that tires of this size and dimension generally weigh between approximately 50 and 100 pounds. *See, e.g.*, EX1126. Because the positive buoyant

force (175-238 lbs) of the air in the tires far exceeds the negative buoyant force (33-66 lbs) that a POSA would expect from the steel and rubber materials, a POSA would have reasonably expected that the SenwaTec tires would be buoyant in water (or liquid manure).

129. Indeed, both Mr. Lonnemann and Mr. Speerschneider confirmed in their depositions that the air filled wheels of the SenwaTec Amphi-King float. EX1109, 65:20-67:19; EX1117, 35:15-37. Accordingly, a POSA would have understood that the middle tires of SenwaTec are buoyant elements that are positioned “in the space that separates” / “in intermediate relation to” the right front tire and the right rear tire and between the left front tire and the left rear tire, satisfying either of the proposed definitions of between.

B. SenwaTec Discloses a Dredging Pump Capable of Pumping Liquid Manure.

130. Nuhn and Mr. Prairie allege that Claims 1, 17, 39 and 40 are not rendered obvious by SenwaTec in view of Yoon or Carrier, because SenwaTec does not disclose a liquid manure pump. Paper 21 at 43-46; EX2099, ¶201. As explained in my prior declaration (EX1004, Section IX), a POSA would have understood that the SenwaTec pump would have been capable of pumping liquid manure. This is further confirmed by the testimony of Mr. Lonnemann, the designer of the SenwaTec Amphi-King, who confirmed that the Amphi-King was capable of pumping liquid

with solid contents of up to about 25% solids. EX1109, 70:20-71:3, 200:11-201:9. Similarly, Dr. Speerschneider, the president of UD Umwelt-Dienste, confirmed in his deposition that the Amphi-King could pump sewage sludge with up to 20 percent. EX1117, 87:13-18.

131. In an effort to support its position, I understand that Nuhn has provided the global assertion that “most centrifugal pumps are incapable of pumping liquid manure.” IPR2024-00004, Paper 23 at 53. This is wrong and far overreaching. A number of references, including the ’708 Patent and the incorporated ’758 Patent, teach centrifugal pumps for pumping liquid manure. *See* EX1098, 261:6-18 (Ian Nunn testifying that the incorporated by reference ’758 Patent teaches a centrifugal pump); EX1037, 51-52; EX1051, 76-80; EX1063, 42-46. A POSA would have understood that most centrifugal pumps are capable of pumping liquid manure. Nuhn relies on a quote from Houle to support its position, but Houle too includes a centrifugal pump with a housing and rotating impeller. EX2010, Fig. 6. In fact, claim 1 of Houle discloses a “centrifugal pump of conventional design.” EX2010, 6:3-4. A POSA would not have understood that Houle teaches centrifugal pumps cannot pump liquid manure, and a POSA would not have looked to Houle to determine whether SenwaTec’s dredging pump is capable of pumping liquid manure, as Nuhn attempts to do without basis.

132. Again, in an effort to support these conclusions, I understand that Nuhn and Mr. Prairie have also relied on their proposed criteria that a POSA would only consider a pump to be liquid manure pump if it were designed, marketed, and/or tested for liquid manure pumping applications. IPR2024-00004, Paper 23 at 53. However, these considerations are subjective, and a POSA would not rely on these arbitrary criteria to determine whether a pump was physically capable of pumping liquid manure. A POSA would have understood that both the material pumped by dredge pumps and liquid manure have some suspended solids. Dredge pumps were known in the art for pumping higher solid concentration sludge from the bottom of manure pits and accordingly there is no reason to assume they would be incapable of pumping much lower concentrations solids in liquid manures found in manure lagoons.

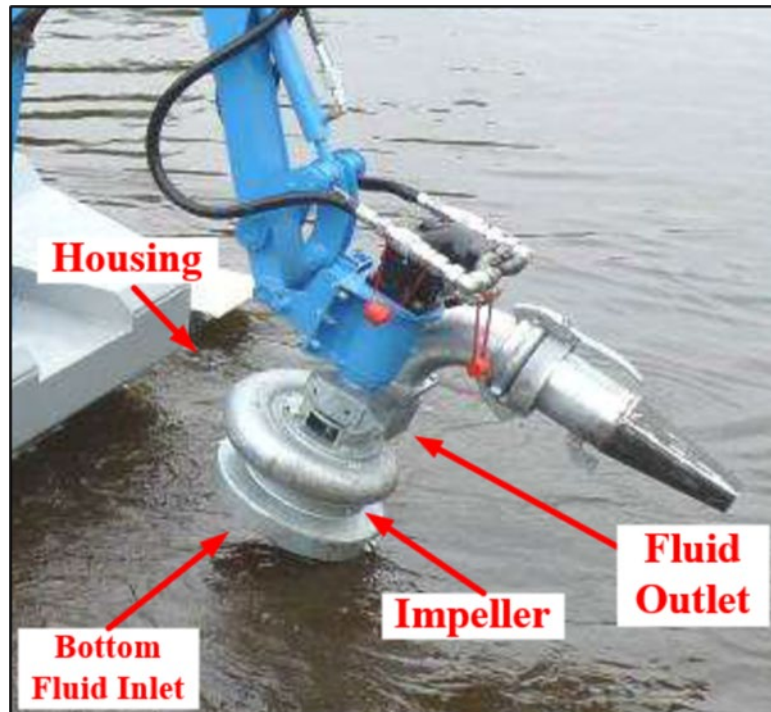
133. Mr. Prairie contends that SenwaTec does not teach that the SenwaTec pump is capable of pumping liquid manure because municipal waste ponds are not like animal manure lagoons and contain bedding material, and because manure acts as a non-Newtonian fluid when pumped. EX2099, ¶201. Neither of these arguments are correct. First, EX1031 shows the SenwaTec vehicle operating in a human manure lagoon and the video clearly shows straw like material on the surface of the reservoir. EX1031, 7:59-8:22. In addition, there is no basis to conclude that the dredging pump would be incapable of pumping fluid laden with bedding

particles, in manure lagoons that include bedding materials. Regarding, the non-Newtonian characteristics of some liquid and slurry manures, as shown above, not all manures exhibit non-Newtonian behavior and those that do are shear-thinning. *See supra* Section VIII.B. Mr. Prairie’s arguments are contrary to significant volumes of literature teaching the use of centrifugal pumps for pumping manure. EX1037, 51-52; EX1051, 76-80; EX1063, 42-46. Contrary to Nuhn’s and Mr. Prairie’s position, the PTAB concluded that SenwaTec would pump liquid manure because it “teaches a dredge pump ... [that] appears capable of pumping liquid with suspended solids.” Paper 10 at 29.

134. A POSA would have understood that the SenwaTec pump is a centrifugal pump including a housing and impeller, because it is described as a “Centrifugal pump with HARDOX inner casing, 6” suction x 6” discharge,” EX1012, 3. A POSA would have understood that such centrifugal pumps include a spinning impeller inside a housing. A POSA would have understood that the SenwaTec pump includes a bottom fluid inlet that draws fluid into the pump housing through an inlet, and that the spinning impeller accelerates the fluid, moving it from the inlet toward the outer edge of the pump housing where it is discharged through a fluid outlet. A POSA would have understood that, as illustrated in the annotated image below, the SenwaTec pump includes a bottom fluid inlet, a fluid outlet, an impeller, and a housing. A POSA would have understood that the SenwaTec pump

impeller would be located within the housing of the pump, above the bottom fluid inlet and adjacent to the fluid outlet.

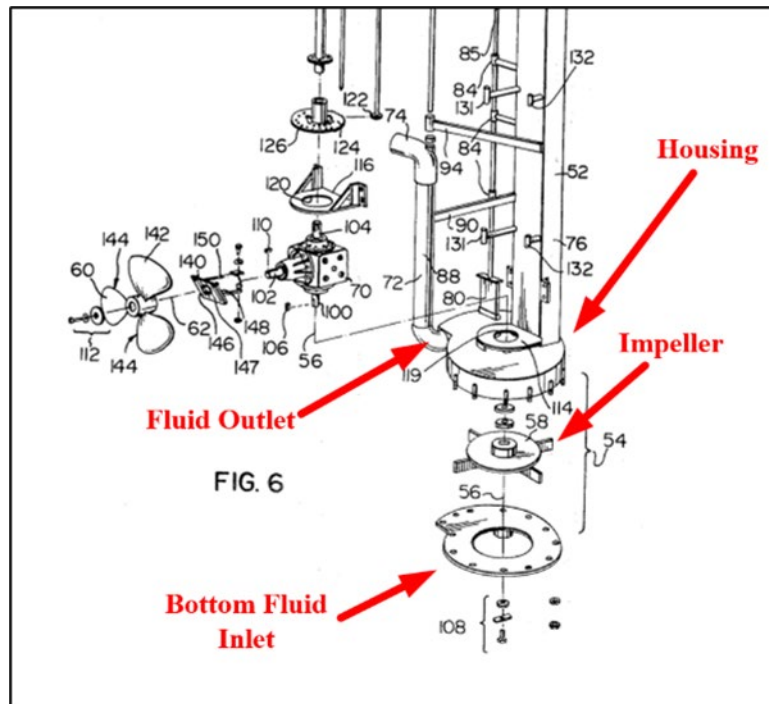
135. A POSA would have further understood that the SenwaTec pump is configured to be immersed in the fluid reservoir from which it is pumping. A POSA would have understood that the SenwaTec is configured to be submerged while the SenwaTec vehicle is floating.



EX1012, 1 (annotated).

136. A POSA would have understood that dredge pumps such as the SenwaTec pump have long been used to pump liquid manure. EX1040, 3; EX1055, 2; EX1063, 64; EX1075, 1; EX1076, 4-5.

137. As shown in the image below, POSA would have also understood that each of the above-identified structural features of the SenwaTec pump are the same features that are described in Houle, which describes a centrifugal pump for pumping slurry manure. EX2010, Abstract, 5:7-21. A POSA would have understood from the teachings of SenwaTec and these common structural features with the Houle pump that the SenwaTec pump could pump liquid manure, which a POSA would have understood is a lower solid content form of manure than slurry manure. EX1061, 11-13.



EX2010, FIG. 6 (annotated).

138. Once again, Mr. Prairie argues about the capability of centrifugal pumps for pumping liquid manure. As shown above, these arguments are incorrect

and contradicted by the '708 Patent, Houle, and the manure pumping literature. *See supra* Section VIII.B. Mr. Prairie's arguments regarding the alleged high total solids content and non-Newtonian behavior of liquid manure are similarly flawed. *See supra* Section VIII.B. As shown above, Nuhn and Mr. Prairie both ignore that regardless of how the term is construed, "liquid manure" includes mixtures of water and manure that are lower than 5% total solid contents and would therefore be pumped by the SenwaTec centrifugal dredge pump. *See supra* Sections VI.B.ii and VIII.B.

139. Moreover, SenwaTec discloses a pump that was used to pump various forms and concentrations of manure. I understand that EX1072 is the translation of EX1031. As shown in EX1031 at 8:54-10:18, SenwaTec pumped human manure from a holding lagoon, which was subsequently applied onto agricultural fields. A POSA would have understood that manure is commonly applied to agricultural fields as fertilizer, and therefore would have understood the material pumped by the SenwaTec vehicle in EX1031 to be manure.

140. EX1073, and the translation in EX1074, also depicts and describes the Amphi-King pumping manure. While Mr. Prairie attempts to distinguish between human manure and other types of animal manure based on its method of treatment, Mr. Prairie's support for these arguments is based purely on a single *US* EPA document. EX2099, ¶35 (citing EX2022). Mr. Funk, the operator of the vehicle in

EX1029-EX1031 and EX1073-EX1074, described how the human manure that he pumped in rural **Germany** using the Amphi-King was **not** artificially processed and included debris such as condoms, tampons, and toilet paper. EX1077, ¶32 (emphasis added). Dr. Speerschneider confirmed this in his deposition. EX1117, 52:5-14. And while Nuhn argues that human manure in “municipal wastewater ponds do not contain animal bedding material (such [as] straw)[,]” the video of EX1031 shows the reservoir containing large amounts of straw-like material mixed in with the human manure. EX1031, 7:59-8:22; Paper 21 at 42; EX2099, ¶35. Nuhn also attempts to distinguish the manure pumped by the Amphi-King based on the bacterial breakdown of the waste (*see* EX2099, ¶35), but this is the same processing technique that the intrinsic evidence describes with respect to farm animal manure: “After anaerobic bacteria breaks down the manure, the manure is pumped from the lagoon.” EX1014, ¶[0003].

141. Even ignoring the fact that Mr. Prairie relies on **US** EPA documents for his assertions regarding human manure processing in Germany, Mr. Prairie fails to consider that many of these “typical” human waste management processes are paralleled very closely by processes employed in agricultural animal waste manure management systems.

142. For example, Mr. Prairie provides that “[t]ypical wastewater treatment facilities for the treatment of human waste include a primary treatment stage and a

secondary treatment stage.” EX2099, ¶35. However, primary and secondary treatment stages were known in the art and employed with manure management systems. For example, AWMFH provides several pages of discussion related to primary and secondary treatments in a manure management system. EX1060, 42-80.

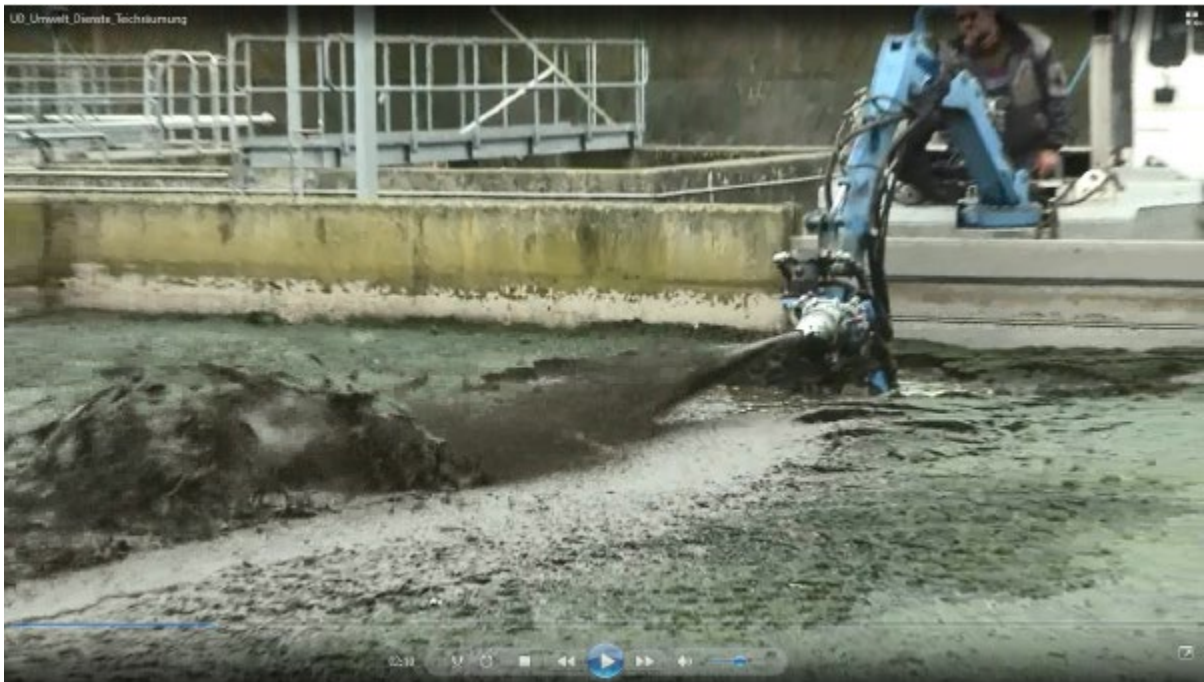
143. AWMFH provides that “[p]rimary treatment includes the physical processes such as solids-liquids separation, moisture adjustment, and dilution. Although not required, primary treatment is often followed by secondary treatment prior to storage or land application.” *Id.*, 42. AWMFH provides examples of solid/liquid separation techniques employed in manure management systems including “mechanical separation” and the use of “settling basins” to remove solids from liquid manure. AWMFH provides that “[a]nimal manure contains material that can often be reclaimed. Solids in dairy manure from animals fed a high roughage diet can be removed and processed for use as good quality bedding.” *Id.*, 42. The EPA document cited by Mr. Prairie describes similar primary processes for human wastewater involving solid-liquid separation. Like the settling basins described in EX1060, EX2022 describes sedimentation tanks where suspended solids sink to the bottom and the mass of solids is called primary sludge. EX2022, 11.

144. A POSA would have understood that human wastewater (manure), given its similarities to animal wastewaters (manure), contains nutrients, including phosphorous and nitrogen, which are similarly found in animal manure.

Accordingly, human waste is often used in land-applications and irrigation of crops, just like liquid manure from processed animal waste in manure lagoons.

145. Mr. Prairie suggests that there is no evidence in the record that would lead a POSA to conclude that the dredge pump disclosed in SenwaTec is a “‘liquid manure pump’ (i.e., a ‘pump that pumps liquid manure’ or a ‘pump with a structure that is capable of pumping liquid manure with suspended solids’).” EX2099, ¶201. Aside from the obvious application and disclosure that the SenwaTec vehicle is used for dredging applications and would be capable of pumping solids, EX1031, screenshots from a video from UD Umwelt-Dienste GmbH illustrates the SenwaTec vehicle and pump being used to pump human manure. As shown in the images below, the SenwaTec vehicle is shown being deployed in a containment reservoir and is shown pumping heavy viscous materials. As supported by the declarations of Mr. Lonnemann (EX1013, 2), Mr. Funck (EX1077, ¶¶6-13), and Mr. Speerschneider (EX1078, ¶¶7-13), a POSA would have understood that the SenwaTec pump was used for pumping manure and agitating manure lagoons. A POSA would have understood from the images in the video of EX1031 that the reservoir had a “crust” of solid and/or semi-solid materials on the surface and that the SenwaTec vehicle and pump were being used to agitate and mix the contents of the reservoir. This video clearly shows the SenwaTec vehicle and pump being used to pump heavy viscous form of manure. While Mr. Prairie has suggested that SenwaTec is incapable

of pumping and agitating manure, when shown this video (EX1031) during his deposition, Mr. Prairie described the activity as agitation. EX1095, 99:3-100:1.



EX1031, 00:33, 02:10.

146. The examples above demonstrate the fallacy of Mr. Prairie's arguments and highlight the many similarities between human waste processing and animal waste processing, including primary (pre-)treatments such as liquid-solid separation, the use of lagoons for secondary biological treatment, and the similar nutrient content and land application of human waste. Aside from his continued reference to crusts, Mr. Prairie has not shown that the pumping requirements for liquid manure are different from the capabilities of the SenwaTec vehicle and its dredge pump. A POSA would have understood that the capabilities of SenwaTec pump exceed those required for pumping liquid manure.

147. Mr. Prairie's arguments are conclusory, generally unsupported, and wholly inconsistent with what a POSA would have understood about dredging pumps and dredge vehicles, liquid manure, the Newtonian behavior of liquid manures, and the ability of centrifugal pumps to pump non-Newtonian fluids. For the reasons described herein, a POSA would have understood that the SenwaTec vehicle, with its dredge pump, was capable of pumping liquid manure.

C. A POSA Would Have Had a Motivation to Combine SenwaTec with Yoon or Carrier with a Reasonable Expectation of Success.

148. As discussed in my prior declaration, it is my opinion that a POSA would have had a motivation to combine SenwaTec and Yoon or Carrier and would have had a reasonable expectation of success in doing so. EX1004, Section IX.A.

149. Nuhn and Mr. Prairie provide the same general arguments regarding the motivation to combine SenwaTec and Truxor. As shown above, each of these arguments provided by Mr. Prairie are wrong and contradict the evidence regarding the motivations of a POSA. *See supra* Section VIII.C.

150. Nuhn and Mr. Prairie have argued that the number of control interfaces of SenwaTec would prohibit the implementation of remote control. IPR2024-00004, Paper 23 at 58-59. Nuhn is wrong. Aside from pointing to the eight interfaces on the vehicle, Nuhn provides no explanation as to what these controls are for or why they could not be readily converted to remote control. Wireless control of amphibious vehicles and their systems, including wheels and tracks, engines, hydraulic systems and booms, and pumping systems, were known in the art. EX1005 ¶¶[0025], [0064]; EX1017 ¶¶[0004], [0121]; EX1010; EX1011 ¶¶[0033], [0047], [0048]. A POSA would have readily understood that remote control of the of these interfaces could be achieved by simply adding channels to the remote control and receiver to control each of these interfaces. This is confirmed the testimony of Mr. Lonnemann, who described how SenwaTec implemented remote control of the SenwaTec Amphi-King back in 2016. EX1109, 183:21-186:8.

151. Nuhn's and Mr. Prairie's reliance on the number of control interfaces as an insurmountable hurdle to the implementation of remote controls is belied by the '708 Patent itself which teaches remote control of 9 different systems: 1) "an

amount of fluid flow from at least the first nozzle,” 2) “angular orientation of at least the first nozzle relative to the vehicle body,” 3) “an amount of fluid flow from at least the second nozzle(s),” 4) “an angular orientation of at least the second nozzle(s) relative to the vehicle body,” 5) “the valve structure in order to proportion fluid flow between the plurality of fluid nozzles,” 6) “rotational speed of the fluid pump,” 7) “raise and lower the fluid pump,” 8) “raise and lower the ground engaging propulsion structure,” and 9) “start and stop the power source.” EX1001, 4:33-59. Similarly, Puck and Carrier each disclose remote control of multi-component systems. *See, e.g.*, EX1004, Sections VI.A.iv and VI.D.iv; EX1014, FIG. 7.

152. Nuhn and Mr. Prairie also suggest that remote control of SenwaTec’s pumping functionality would be a problem because SenwaTec shows the operators of the vehicle standing up while pumping. EX2099, ¶227. First, the assumptions as to what the operators are doing and why they are doing it are speculative, at best. I understand that Mr. Lonnemann testified in his deposition that these photographs depict him operating the vehicle during testing runs, and that in normal use, the vehicle would not operate if the operator were not sitting down while driving. *See* EX1109, 45:6-46:17.

153. Regardless, there is no rational connection between the operator standing to look at the pump and whether application of remote controls to the SenwaTec vehicle would be successful. In fact, a POSA considering the images

Nuhn and Mr. Prairie rely on, might appreciate that the operator is standing to see over the edge of the vehicle and that the front end of the vehicle would have obstructed his view if seated. They fail to consider that if the operator were remotely positioned onshore, he might have an unobstructed view of the pump because the front end of the vehicle would not be obstructing his view.



EX1012, 2 (annotated).

154. Mr. Prairie alleges that POSAs would not have been motivated to implement remote control into SenwaTec because operators would not be able to feel tactile feedback from the machine. EX2099, ¶¶218, 221, 230. However, Mr.

Prairie is wrong because regardless of his concerns regarding tactile feedback, a POSA would have understood that remotely controlled vehicles and their functions can be observed from nearby and visual information for a remote operator can be used in place of tactile information for an operator.

155. Mr. Prairie relies on references to land-based excavators, described in EX2025 and EX2028, to support his opinion that the application of remote-control systems would not function with SenwaTec. As discussed previously, Mr. Prairie's reliance on these studies to assess whether the remote-control systems of Yoon and Carrier would be successful with the SenwaTec vehicle are misplaced and inappropriate. And Mr. Prairie's arguments are further belied by the testimony of Ian Nuhn, which demonstrates the ease at which remote controls systems can be adapted for different control applications. *See supra* Section VIII.C.

156. Mr. Prairie asserts that a POSA would expect instability issues on the vehicle by implementing remote control. EX2099, ¶¶228-230. To the extent a tilting risk exists, and SenwaTec has any instability issues, a POSA would have been motivated by the safety benefits afforded by adding remote operation to the vehicle. Mr. Prairie contends that a POSA would not have a reasonable expectation of success because the vehicle has to traverse steep embankments that can be slippery. EX2099, ¶230.

157. However, Mr. Prairie ignores the heavy-duty off-road tires and tracks that are disclosed by SenwaTec, which a POSA would have understood to be well-suited for negotiating such conditions. Of course, a POSA would have understood that all vehicles have less traction on slippery or icy embankments, but that does not mean SenwaTec is incapable of traversing them or that SenwaTec fails to meet the claim limitations of the '708 Patent claims. Nor does it mean a POSA would have been dissuaded from adding remote control to the SenwaTec vehicle. Similarly, neither Nuhn nor Mr. Prairie provide any analysis to show that the SenwaTec vehicle lacks sufficient stability. In contrast, a POSA would look at the vehicle of SenwaTec and appreciate that it has a relatively low profile, relatively wide tracks, relatively long wheelbase, and aggressive tire treads and tracks as shown in the images below. Nuhn and Mr. Prairie's assertions are conclusory and contrary to what a POSA would have understood.



EX1012, 1-2.

158. In sum, Nuhn’s and Mr. Prairie’s arguments that the combination of SenwaTec with the remote-control systems of Yoon or Carrier would be unsuccessful are unreliable, based on inappropriate and unrelated references, and rely on arbitrary and baseless criticisms of the SenwaTec vehicle. As explained in my previous declaration, a POSA would have been motivated to combine SenwaTec with the remote-control systems of Yoon or Carrier because of the safety benefits provided and would have had a reasonable expectation of success. EX1004, ¶¶236-239; *see supra* Section VIII.C.

D. SenwaTec Discloses the Claimed Combination of Elements.

159. Mr. Prairie asserts that the claims of the ’708 Patent specifically relate to a vehicle disrupting crust and recirculating liquid manure in a manure lagoon as well as driving into, out of, and navigating the manure lagoon by wireless control. EX2099, ¶213. Mr. Prairie’s statement is contrary to the express language of the ’708 Patent claims. Specifically, the claims of the ’708 Patent do not provide any reference to “crust” or to the function of “disrupting the crust.”

160. In an effort to support this position, Mr. Prairie points to SenwaTec’s marketing brochure touting: “40 Years of Experience in the Development of: – Ditch Cleaner and Slope Mowers – Mowing and Clearing Boats – Weed Harvesters – Amphibious Vehicles – Cutter Suction and Excavating Dredges.” EX2099, ¶214.

These representations of the SenwaTec company's development experience are irrelevant to the capabilities of the SenwaTec vehicle. Mr. Prairie concludes from this that if a POSA "were to even make a combination of SenwaTec with Yoon or Carrier, the result would be an amphibious remote-controlled weed clearing and dredging vehicle – not an amphibious manure lagoon agitation/pumping vehicle." EX2099, ¶215. Mr. Prairie arbitrarily inserts the "weed clearing" term, but Mr. Prairie acknowledges that the combination would result in an amphibious remote-controlled pumping vehicle with a dredge pump. *Id.* A POSA would have understood that dredge pumps, including the dredge pump of SenwaTec, were capable of pumping liquid manure. *See supra* Section IX.B. A POSA would have understood that SenwaTec's additional weed clearing attachments have nothing to do with the capabilities of the amphibious dredging vehicle and pump of SenwaTec and whether they meet the limitations of the '708 Patent claims.

E. Dependent Claims 8-16, 18, 22, 24-28, and 35-38..

161. Claims 8-15, 18, 22, 24-28, and 35-38 each depend from one of claims 1, 17, 21, or 23. Neither Nuhn nor Mr. Prairie provide any analysis or opinion regarding these claims and obviousness over SenwaTec in view of Yoon or Carrier, aside from referring back to previous claims from which they depend.

162. As discussed in my prior declaration, it is my opinion that these claims are obvious over SenwaTec in view of Yoon or Carrier. EX1004, Sections IX.C-I and IX.K-O.

163. As for dependent claim 16, while Nuhn and Mr. Prairie do not dispute that the center of gravity of the SenwaTec vehicle is located along the longitudinal centerline, Nuhn and Mr. Prairie allege that the SenwaTec vehicle's center of gravity is not located substantially in a middle of the vehicle in the fore-and-aft direction of the vehicle. Claim 16 says nothing about the center of gravity being located substantially in a middle of the vehicle in the *fore-and-aft direction*. Regardless, SenwaTec discloses that a cockpit located substantially in a middle of the vehicle in the fore-and-aft direction. Furthermore, SenwaTec discloses a vehicle engine located immediately behind that cockpit. A POSA would have understood that the weight of the vehicle engine would counter the weight of the pump attached to the lift arm at the front of the SenwaTec vehicle. SenwaTec further discloses that the remainder of the components on the vehicle (i.e. the wheels, pontoons, and vehicle body) appear to be symmetrically arranged along the vehicle in the fore-aft direction. This arrangement of components provides a center of gravity that is generally located substantially in a middle of the vehicle in the fore-and-aft direction. For the purposes of stability on both land and water, a POSA would have understood that a vehicle such as SenwaTec would be designed to have the center of gravity located

substantially in a middle of the vehicle in the fore-and-aft direction. Therefore, even if Claim 16 were to require the center of gravity to be located substantially in a middle of the vehicle in the fore-and-aft direction, it is my opinion that claim 16 is obvious over SenwaTec in view of Yoon or Carrier.

X. GROUND 4: CLAIMS 17-18, 23-26, AND 35-38 ARE RENDERED OBVIOUS BY THE COMBINATION OF PUCK AND BRYHAM

164. Claims 17-18, 23-26, and 35-38 of the '708 Patent are rendered obvious by Puck in view of Bryham. POSAs would have been motivated to add the ground engaging wheels of Bryham to the Puck vehicle and would have had a reasonable expectation of success. A POSA would have understood that the logical location to connect the wheels of Bryham to Puck would have resulted in the floatable dock sections being arranged between (“in the space that separates” or “in intermediate relation to”) the front and rear wheels on each side of the vehicle.

A. The Combination of Puck and Bryham Discloses Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle.

165. Nuhn argues that the placement of Bryham’s wheels on Puck would not result in buoyant elements positioned between the front wheel and rear wheel on each side of the vehicle. For this reason, Nuhn argues that the combination of Puck and Bryham fails to render obvious elements [17.3], [21.1]-[21.2], and [23.1]. Paper

21 at 57-64. As explained below, Nuhn is wrong. These claim elements are reproduced below:

[17.3] a floatable vehicle body comprising a first buoyant element situated between the first front wheel and the first rear wheel and a second buoyant element between the second front wheel and the second rear wheel;

[21.1] a floatable vehicle body comprising a first buoyant element on a first side of the vehicle body and a second buoyant element on a second side of the vehicle body;

[21.2] a ground engaging propulsion structure comprising a first front wheel, a second front wheel, a first rear wheel, and a second rear wheel, wherein the first front wheel and the first rear wheel are on the first side of the vehicle body and the second front wheel and the second rear wheel are on the second side of the vehicle body, and wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;

[23.1] a floatable vehicle body comprising buoyant elements having foam filled buoyant chambers, the buoyant elements comprising a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front wheel and a second rear wheel;

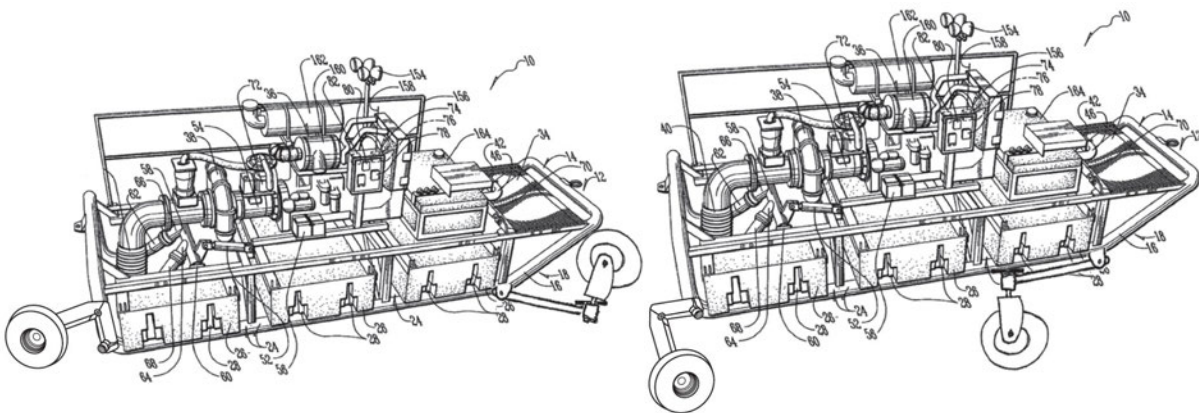
166. As explained in my prior declaration, a POSA would have been motivated to place one wheel of Bryham at each corner of the Puck vehicle, as this is the conventional arrangement of wheels placed on a four-sided vehicle style like the one disclosed in Puck. EX1004, ¶¶294-295. Such a configuration would have been obvious to a POSA. For example, I understand that prior to 2013, Sealegs publicly used versions of its commercial embodiment of EX1015 that included more

than three wheels. EX1138, 62:2-63:13. A POSA would have understood that the natural location to attach the wheels of Bryham to Puck would be to the steel frame 14 of Puck, which is the conventional location to attach wheels to a vehicle.

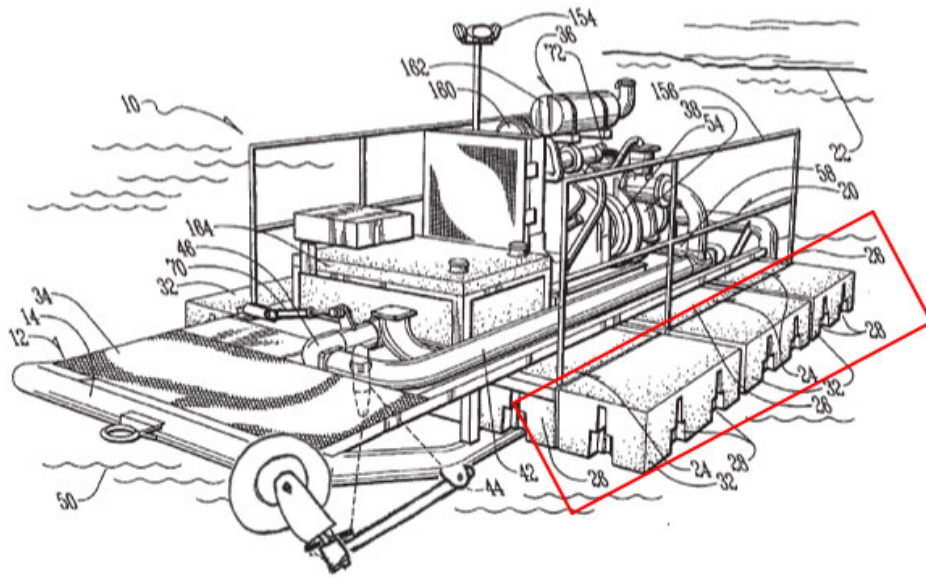
167. Nuhn alleges that this would require discarding Bryham's steerable front wheel in favor of adding another pair of Bryham's rear wheels. While that may be one way in which to implement the proposed modification, the modification could also be implemented by simply moving the steerable front wheel to one front corner of the vehicle while adding another steerable front wheel to the other front corner of the vehicle. Such a modification would be within the capabilities of a POSA, as the arrangement of a four wheeled vehicle with two steerable front wheels is well known for use on various off-road vehicles. A POSA would have understood that the retractable functionality of the wheels could be maintained when implemented on Puck to reduce drag on the vehicle and the overall draft of the vehicle as it is moving while floating within the lagoon, as shown in the modified figures below. A POSA would have understood that reducing the drag and reducing the draft of the vehicle would be advantageous while working in a lagoon, as it would permit the vehicle greater versatility to move about the lagoon and work in shallower parts of the lagoon.

168. A POSA would have appreciated that the retractable wheels of Bryham rotate away from the vessel's hull. For example, the front wheels illustrated in

Bryham rotate forward and the rear wheels illustrated in Bryham rotate rearward when retracting. A POSA would be motivated to utilize and maintain that same convention when adding Bryham's amphibious wheels to the Puck vehicle, as illustrated below, because it would allow the wheels to retract to reduce drag and draft without interfering with the modular dock sections of Puck.



169. Puck discloses that dock sections 26 and additional dock sections 32 extend outboard of the steel frame 14 of the Puck vehicle body 16, as shown in the modified figure below.



EX1014, FIG. 2 (modified and annotated).

170. A POSA would have understood that when Bryham's wheels are mounted to the steel frame of Puck and arranged in the retracted state, the modular dock sections 26 or 32 of Puck would be arranged between ("in intermediate relation to" / "in the space that separates") the front and rear wheels on each side of the vehicle. Even in a deployed state, the modular dock sections 26 and 32 would be positioned between ("in intermediate relation to") the front and rear tires. This same arrangement is disclosed by Sundstrom, which is another prior art amphibious manure agitation vehicle. Other pre-2013 amphibious vehicles disclose this same arrangement of buoyant elements and wheels. *See supra* Section VIII.A.



EX1100, ¶7.

171. A POSA looking at the teachings of Sundstrom would have understood that Sundstrom's arrangement of floatable elements between the wheels is beneficial, as it allows for the wheels and floatable elements of the vehicle to be positioned furthest outboard from the vehicle centerline (providing additional stability) while simultaneously keeping the overall width of the vehicle sized to permit highway travel. Thus, a POSA would have been motivated to retain this arrangement of components when combining the teachings of Puck and Bryham.

172. Nuhn ignores the teachings of Sundstrom, arguing extensively that one would have been motivated to add more than four wheels to Puck, because Carrier-I, Carrier-II, and SenwaTec have more than four wheels. Paper 21 at 60-64. The simple fact that some vehicles have more than four wheels, does not negate the fact that a four wheel configuration would have been obvious and a natural choice for adding Bryham's wheels to a four-sided vehicle like Puck. This is the same configuration

as used in Sundstrom as well as many other amphibious vehicles, with one wheel positioned at each corner of the four-sided vehicle.

173. However, even accepting Nuhn's argument, a POSA would have understood that air filled wheels would be the natural choice for the wheels of Bryham. Indeed, Bryham even states that its wheels include "balloon type tires." EX1015, Abstract. A POSA would have understood that balloon type tires are air filled. A POSA would have understood that such intermediate wheels would float and would therefore properly be considered "floatable elements." *See supra* Section IX.A. Regardless, a POSA would have understood that either a four-wheeled configuration like Sundstrom and many other vehicles or a six-wheel (or more) configuration like the SenwaTec vehicle could be implemented on the Puck vehicle with a reasonable expectation of success. Either configuration would result in a configuration with a floatable element between the right front wheel and the right rear wheel and a floatable element between the left front wheel and the left rear wheel.

B. The Combination of Puck and Bryham Discloses a Power Source Configured to Provide Power to Both the Ground Engaging Propulsion Structure and the Liquid Manure Pump.

174. Nuhn argues that the combination of Puck and Bryham fails to render obvious a power source configured to provide power to move the vehicle when the vehicle is ground and engaging and floating. Paper 21 at 65-66. For this reason,

Nuhn argues that Puck and Bryham fail to render obvious elements [17.5] and [23.3].

As explained below, Nuhn is wrong. These claim elements are reproduced below:

[17.5] a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in the liquid manure lagoon; and,

[23.3] a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in a liquid manure lagoon; and,

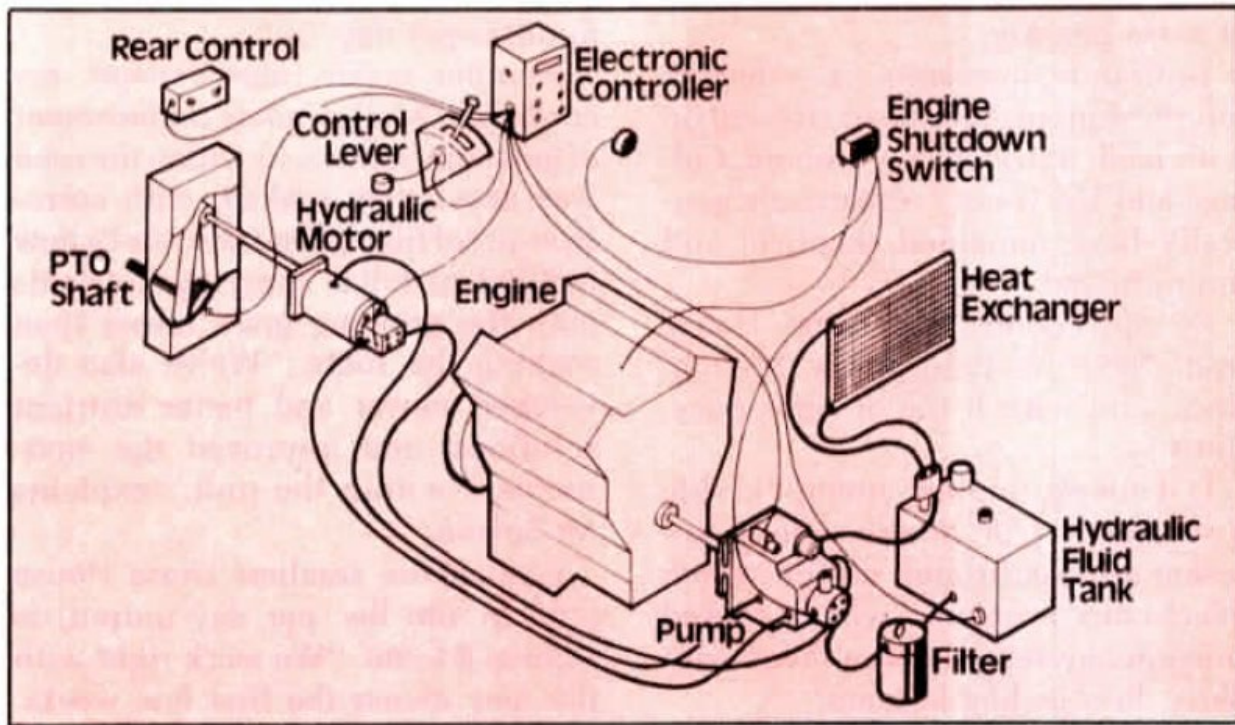
175. Nuhn and Mr. Prairie assert that neither Puck nor Bryham disclose a power source that provides power to both the liquid manure pump and a ground engaging propulsion structure. Paper 21 at 65-66; EX2099, ¶¶266-268. This is wrong. A POSA would have been motivated to use the Puck power source to power both the liquid manure pump and the ground engaging propulsion structure using the Bryham hydraulic transmission. Such arrangements were well known in the art, and as explained below, a POSA would have understood that such an arrangement would be cheaper, lighter, and more efficient. *See* EX1004, ¶286.

176. Nuhn and Mr. Prairie both point to the hydraulic pump on Puck, which is powered by a 12-volt battery, as being insufficient. Paper 21 at 65-66; EX2099, ¶268. This is a red herring. It does not accurately reflect the proposed combination, ***which would utilize the diesel engine power source*** of Puck (as taught by Bryham) to power the hydraulic pump and transmission of Bryham, delivering power to the

slurry pump and wheels. As explained herein, the technology and motivation for using Puck's power source to power the wheels and the liquid manure pump is clear.

177. Nuhn and Mr. Prairie disregard multiple configurations taught by Bryham that disclose a single power source to power the ground engaging propulsion system and the marine propulsion system. For example, Bryham teaches configurations where the ground engagement means are powered by the marine engine and a power take-off system is used to complete the drive train. EX1015, 15:33-16:42.

178. In view of these teachings of Bryham, it would have been obvious for a POSA to use the engine of Puck to power the Bryham hydraulic pump and transmission (EX1015, 15:61-67), which Bryham describes as driving the vehicle wheels. A POSA would have further understood that using the hydraulic drivetrain of Bryham to power the Puck pump with a PTO shaft would be trivial—as Mr. Prairie concedes (IPR2023-01161, EX2029 at ¶172), such configurations were well understood by POSAs since the 1970s:



EX1107, 18.

179. Without attempting to refute the accuracy of my opinion, Mr. Prairie alleges that I did not explain why powering the pump and ground engaging propulsions structure from a single engine would be less expensive, more efficient, take up less space and weigh less. EX2099, ¶¶267-268. Mr. Prairie disregards the understanding of a POSA with respect to well-known PTO systems.

180. A POSA would have understood that such PTO systems were used in a variety of applications, for example fire trucks/engines, wrecker trucks, refuse trucks, concrete mixers, and various industrial equipment, because of the benefits that they provide. The benefits of PTO systems were well-known to POSAs for a considerable period prior to the '708 Patent. Morrell (1980) describes many of the

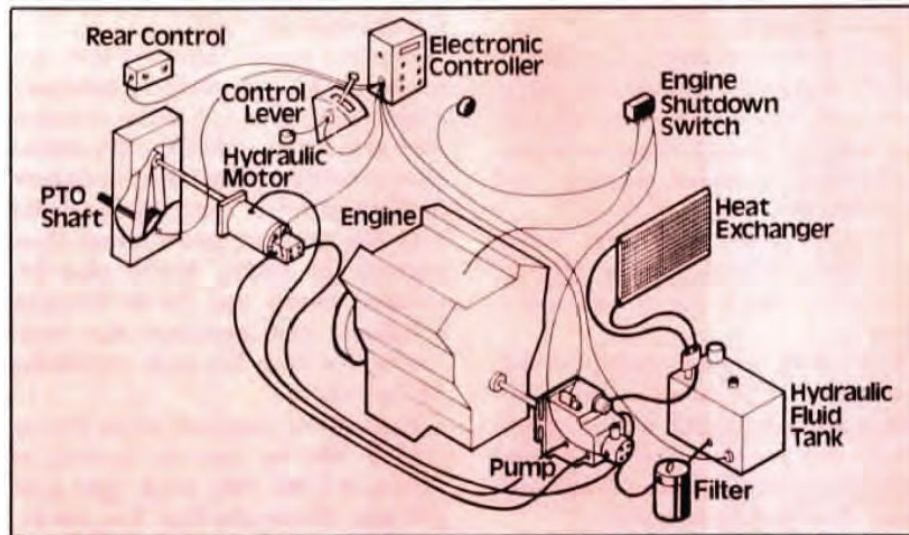
benefits associated with the use of PTO systems and some of the history, including an early example of a PTO application from 1904. EX1122, 2. For example, related to efficiency, one of the benefits I attribute to PTOs, Morrell provides that “power take-off has provided great versatility in the mechanization of the farm, and this has helped to lower the overall cost of food production.” *Id.*, 1. As another example, with regard to cost-savings with PTO use, Morrell provides that the “extra cost and complications of adding an engine to the implement prompted the re-introduction of the independent PTO.” *Id.*, 5. The PTO system was considered a major innovation and even revolutionary. Nelson (EX1133) provides that:

Improvements in tractor design and performance continued at a swift pace. In the 1920s the major innovation was the power take-off shaft. It enabled tractor power to be applied directly to harvesting implements, eliminating the need for auxiliary engines. The power take-off shaft also allowed the development of a variety of tractor powered spreaders and sprayers that would later revolutionize fertilizer and pesticide applications procedures.

EX1133, 71-72.

181. As to the weight and space requirements, a POSA would have understood that the cost of a hydraulically-powered PTO and the space required for such a PTO is typically less than a secondary engine and associated equipment. While a variety of PTO configurations exist, the relative size and relative cost between a hydraulically powered PTO and a secondary engine would have been

readily apparent to a POSA. An example of the relative size of a hydraulically powered PTO unit compared to the engine is illustrated in example image below.



EX1129, 18.

182. Mr. Prairie’s reference to a Bryham configuration where separate electric motors are used to drive the wheels does not negate or diminish the many benefits of using hydraulic PTO systems. EX2099, ¶268. Certainly, there are almost always trade-offs between designs and different configurations, and Bryham contemplates several different configurations. Mr. Prairie is wrong that the benefits of a PTO system would not have been obvious. A POSA would have been familiar with a variety of PTO options and would have understood the many benefits I have described herein.

183. Mr. Prairie also contends that a certain combination must be found in “teachings in the prior art references themselves” to conclude that the claimed

arrangement must be “obviously the best” to render the claims obvious. EX2099, ¶268. Mr. Prairie applies the wrong standard. I understand that Mr. Prairie’s “obviously the best” test is not the proper test for determining invalidity based on obviousness. Rather, I understand that one of the tests for obviousness is whether one would have arrived at the claimed arrangement after choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success. Here, it is my opinion that when choosing from the finite number of solutions for implementing control of the ground engaging wheels of Bryham combined with the vehicle of Puck, a POSA would have understood that powering the hydraulically powered wheels from the power source on the Puck vehicle that powers the slurry pump would provide the predictable result of powering both components and would have yielded a reasonable expectation of success. Further, a POSA would have understood that the diesel engine on the Puck vehicle was readily capable of providing output power to more than one device using the hydraulic transmission taught by Bryham.

C. The Combination of Puck and Bryham Discloses Remote Control Configured to Control the Ground Engaging Means.

184. Nuhn argues that the combination of Puck and Bryham fails to render obvious a remote control configured to control the ground engaging means. For this reason, Nuhn argues that Puck and Bryham fails to render obvious elements [17.6],

[21.7], and [23.4]. As explained below, Nuhn is wrong. These claim elements are reproduced below:

[17.6] a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.

[21.7] a wireless remote control configured to enable an operator remote from the vehicle to: (1) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; (2) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon; and, (3) control a flow of liquid manure from the liquid manure pump.

[23.4] a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.

185. Nuhn and Mr. Prairie assert that Puck's remote-control system would not provide wireless remote control of the ground engaging propulsion structure of Bryham. Paper 21 at 67-69; EX2099, ¶¶269-270. They are wrong. A POSA would have been motivated to configure the remote-control system of Puck to control the speed and direction of Bryham's wheels. EX1004, ¶¶287-289. A POSA would have understood that Puck's remote-control system was readily adaptable to control the wheels of Bryham using components readily available and known in the art.

186. These opinions and arguments are belied by the testimony of the named inventor, Ian Nuhn, who testified that he had little or no education as an engineer. When questioned whether he bought off-the-shelf remote-control components to drive his Lagoon Crawler prototype, Mr. Nuhn testified that they had remote control systems for liquid manure tankers, and he worked to program it for the Lagoon Crawler. EX1098, 142:9-17. Mr. Nuhn's testimony illustrates the ease with which remote control systems can be adapted for different control applications, including the amphibious pumping vehicles at issue here.

187. Further, remote control systems were known in the art and were capable of controlling a variety of systems and components. Specifically, to the operation of wheel motors, Carrier teaches the remote control of a ground engaging propulsion system consisting of wheels driven by hydraulic motors and a series of valves to regulate the flow to control the vehicle. EX1005, ¶¶[0039]-[0045], [0064]-[0065]. Other patents teach the remote control of amphibious vehicles, including Yoon, Carrier, and Bennett-II. EX1010-EX1011; EX1017. A POSA would have understood that the implementation of remote control of an amphibious vehicle and its land-based propulsion system is a straightforward and predictable process.

188. The '708 Patent supports my conclusions on this topic. The '708 Patent teaches that the amphibious vehicle and its various systems can be controlled with a remote control, however it provides almost no detail as to the structure or details of

the remote-control system or the devices it controls. EX1001, 4:33-58. For example, the '708 Patent provides that the “remote control structure may comprise a wireless transmitter and a wireless receiver.” *Id.*, 4:38-39. Regarding the ground-engaging propulsion system, the '708 Patent merely provides that the “remote control structure may be configured to control the speed and or direction of the vehicle when ground engaging and when floating.” *Id.*, 4:39-42. Almost no other details of the remote-control system or its structure are provided in the '708 Patent. As the '708 Patent implicitly acknowledges, a POSA would have been capable of filling in the details and would have understood that wireless devices were readily available to control a variety of devices including hydraulic valve structures configured to provide proportional flow.

189. A POSA would have understood that Puck and its remote-control system were already configured to control the flow of hydraulic fluid. Puck uses hydraulic cylinders which are remotely controlled to adjust the orientation of the discharge nozzles for steering and propelling the vehicle. EX1014, ¶[0032]. A POSA would have understood that this feature of Puck’s remote-control system would be readily adapted to control the flow of hydraulic fluid to the wheel motors of Bryham.

190. Puck teaches “a wireless receiver (80) and a wireless transmitter (82), that allow the control panel (74) to operate as a wireless remote control, actuated by a remote[-]control system (84).” EX1014, ¶[0031]. A POSA would have readily

understood that remote control of the wheels of Bryham could be achieved by simply adding channels to the remote control and receiver to the vehicle for changing the position of the hydraulic valves 107 used to selectively direct hydraulic fluid to the wheel motors 108 of Bryham. EX1015, 16:1-12. This is the same methodology already taught by Puck for remotely controlling gate valves to direct fluid to the nozzles. EX1014, ¶¶[0031], [0033].

191. Puck also teaches that its remote-control system can be used to adjust the throttle, and the remote-control system comprises throttle up and throttle down buttons. *Id.*, ¶[0032]. A POSA would have understood that throttling up and increasing the speed of an engine would increase the speed of devices coupled to the engine output, such as a hydraulic pump. A POSA would have understood that the throttle regulation of the Puck engine would be one method readily available for regulating the speed of Bryham's wheels using the remote-control system of Puck. Likewise, POSAs would have understood that Bryham's hydraulic "steering actuator" could be remotely controlled using Puck's remote control hydraulic actuator teachings. EX1015, 6:16-38; EX1014, ¶[0031].

192. A POSA would have understood that there were a variety of options available for controlling the land-engaging propulsion structure of Bryham wirelessly with the use of remote-control systems. A number of such examples are found in the prior art patent literature, and a POSA would have had a reasonable

expectation of success in implementing a remote control of the Bryham wheels in combination with the Puck vehicle. Mr. Prairie does not provide any coherent explanation as to why the implementation of remote control of Bryham's ground-engaging propulsion system would not be straightforward and would not yield predictable results. In fact, I understand that Maurice Bryham, the inventor of EX1015, stated in his deposition that remote control was added to Sealegs' amphibious vehicle commercial product prior to 2013. EX1138, 66:20-68:6.

D. The Combination of Puck and Bryham Discloses a Vehicle Wherein Each Wheel is Powered by Its Own Variable Speed Hydraulic Motor.

193. Nuhn argues that the combination of Puck and Bryham fails to render obvious a vehicle with four wheels, each powered by its own a variable speed hydraulic motor and therefore fails to render obvious element [17.2]. As explained below, Nuhn is wrong. This claim element is reproduced below:

[17.2] four variable speed hydraulic motors, one variable speed hydraulic motor per wheel, for independently driving the wheels at variable speeds;

194. Regarding claim 17, Nuhn and Mr. Prairie assert that Puck and Bryham would not be combined to provide a ground engaging propulsion structure where each wheel is powered by its own variable speed hydraulic motor. Paper 21 at 66-67; EX2099, ¶¶333-334. Nuhn and Mr. Prairie assert that “the front wheel in Bryham (i.e., the one at the bow that swivels) is not powered at all and therefore is not

powered by its own variable speed hydraulic motor[.]” Paper 21 at 66; EX2099, ¶333. They are wrong.

195. A POSA would have understood that the front wheel of Bryham may be powered, contrary to what Nuhn and Mr. Prairie assert. Bryham clearly teaches that all of the wheels may be powered, including the front wheel. Bryham discloses that the “ground engaging means consists of *at least* three wheels.” EX1015, 2:46-47 (emphasis added). “[O]ne or more of the ground engaging means supported thereon is provided with motive power.... the motive power is provided by ... hydraulic motors.” *Id.*, 6:47-53 (emphasis added). From Bryham’s teachings that one or more of the wheels could be provided with motive power from hydraulic motors, a POSA would have understood that the number of powered wheels would not be limited to 2 (or any other number) and that all of the ground engaging means could be hydraulically powered, including the front wheel(s).

196. A POSA would have understood that Bryham teaches configurations where each wheel is powered by its own variable speed hydraulic motor. Mr. Prairie relies on an image of Figure 3A to support his conclusion that the front wheel of Bryham is not powered. EX2099, ¶333.

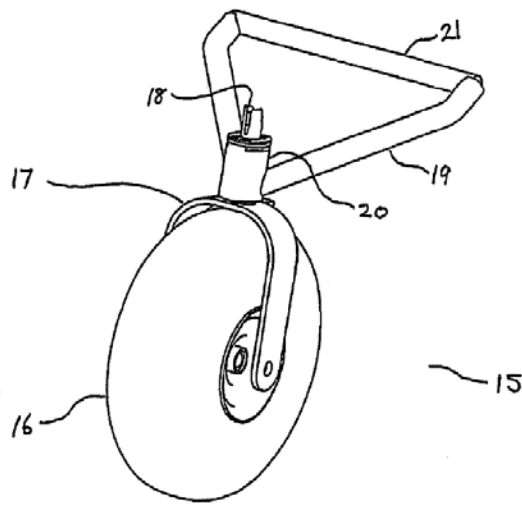


Figure 3A

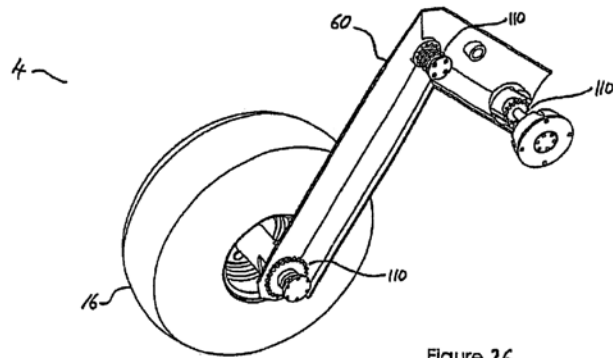


Figure 26

EX1015, FIGS. 3A and 26.

197. Nuhn and Mr. Prairie ignore the teachings of Bryham. A POSA would have understood that the front wheel shown in Figure 3A could be powered. Bryham teaches that “the hydraulic motor 108 can be mounted directly beside or within the ground engagement means 16[.]” EX1015, 16:6-8 (emphasis added). A POSA would have clearly understood from this description that Bryham discloses embodiments where both the front and rear wheels (reference number 16), would have a hydraulic motor mounted directly beside or within it. Nowhere does Bryham teach that powered wheels were limited to two rear wheels, as Nuhn and Mr. Prairie assert.

198. An archived webpage of Bryham’s commercial embodiment confirms the all-terrain nature of the vehicle and its ability to navigate steep embankments. EX1111, 1. This article from 2011, illustrates that Sealegs, the assignee listed in

Bryham (EX1014, 1) and Bryham's commercial embodiment, was producing all-wheel drive (AWD) vehicles. EX1111 provides that "[w]ith the front and two rear wheels driving, Sealegs can scale steep river banks and beachheads.... This new option is available on Sealegs amphibious boats built from May 2010 onward and means that an additional wheel motor is added to the front wheel. Having all three wheels driving provides additional traction to significantly increase Sealegs' capabilities on steep slippery inclines or when traveling across heavy mud or quagmire." *Id.* The teaching of Sealegs (EX1111) confirms that Bryham's front wheel may be powered. I understand that this was confirmed by the inventor of EX1015, Maurice Bryham, in his deposition. EX1138, 16:7-17:23.



Id.

199. A POSA would have understood that the wheels of Bryham would be operable at variable speed. Puck teaches that its remote-control system can be used to adjust the throttle, and the remote-control system comprises throttle up and throttle down buttons. EX1014, ¶[0032]. A POSA would have understood that throttling up and increasing the speed of an engine would increase the speed of devices coupled to the engine output, such as a hydraulic pump used to drive the hydraulic motors powering the Bryham wheels. EX1135, 4. A POSA would have understood that in most cases, increasing the speed of the hydraulic pump would also increase the speed of the hydraulic motors connected to the hydraulic transmission. *Id.* A POSA would have understood that the throttle regulation of the Puck engine would be one method readily available for regulating the speed of Bryham's wheels using the remote-control system of Puck. *Id.*

E. A POSA Would Have Been Motivated to Combine Puck and Bryham.

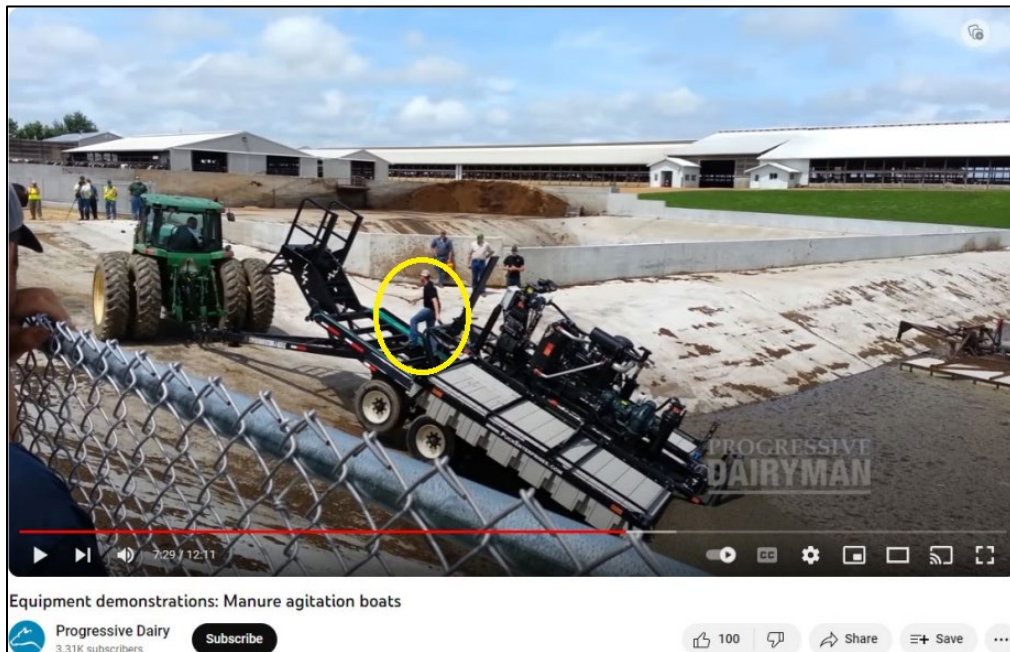
200. Nuhn and Mr. Prairie ignore the basic knowledge and understanding of a POSA, providing a scattershot of excessive, unsubstantiated, and meritless arguments regarding the motivation to combine Puck and Bryham. Below, I address each of these points and explain why all of them are wrong.

201. As explained in my prior declaration, a POSA would have been motivated to combine Puck and Bryham because it would make launching and retrieving the floating vehicle easier and safer, and it would eliminate the need for a trailer or a person to be in or adjacent to a hazardous and corrosive manure lagoon. EX1004, ¶¶276-282. Nuhn does not provide any counterargument to the fact that the combination of Puck and Bryham would make launching and retrieving the vehicle safer and easier.

202. Nuhn and Mr. Prairie argue that there would not have been sufficient motivation to combine Puck and Bryham at least because: 1) Puck can be launched/retrieved without backing the trailer into the lagoon, 2) the combination would not solve the alleged problem of equipment exposure to corrosive lagoon environments, and 3) because the hydraulic wheels will lock if the vehicle breaks down or runs out of gas. Paper 21 at 69-73; EX2099, ¶¶273-280. Nuhn is wrong on all three points.

203. Nuhn and Mr. Prairie assert that launching and retrieving Puck's boat does not require a user to enter or go near a manure lagoon. EX2099, ¶276. Mr. Prairie cites a 2014 video by Progressive Dairyman (EX2008) which shows the Puck boat being launched. However, as shown in Mr. Prairie's cited video below, the launching process of the Puck vehicle *does* put a user in close proximity to the reservoir. A POSA would have understood that climbing over the trailer and vehicle

would put the user at risk of falling into the reservoir or being dragged into the reservoir while the Puck vehicle is sliding or being pushed into a manure lagoon. Accordingly, a POSA would have been motivated to remove a user from that environment by adding the amphibious wheels of Bryham to the Puck vehicle to make launching and retrieving easier and safer, which is explicitly taught by Bryham. I understand that this was confirmed by the inventor of EX1015, Maurice Bryham, in his deposition. EX1138, 15:8-16:6.



EX2008, 6 (annotated); EX1118, 7:25-9:40.

204. Nuhn and Mr. Prairie also fails to consider that EX2008 does not show the Puck vehicle being retrieved from the reservoir (only launched), and Mr. Prairie does not consider other teachings of Puck that a POSA would have understood would require an individual to be either at the edge of or in the manure lagoon during

such a process. Puck teaches that “the agitator (10) may be coupled to a cable (146) and winch (148) provided on the trailer (132).” EX1014, ¶[0038]. A POSA would have understood that to couple the cable and winch to the floating agitator, an operator would need to approach the edge of the lagoon and even wade into the manure lagoon to reach the Puck vehicle and connect the cable. Nuhn and Mr. Prairie fail to consider the retrieval process and base their arguments on only half of the process of launching and retrieving the Puck vehicle.

205. Regarding the corrosive environment, Mr. Prairie alleges that POSAs concerned with mitigating effects of corrosion would not add Bryham’s wheels to the Puck vehicle. However, the Bryham vehicle and its amphibious undercarriage system were designed for use in a corrosive environment. EX1015, 1:55-58. I understand that Maurice Bryham, the inventor of EX1015, confirmed this in his deposition. EX1138, 34:25-36:25. On the other hand, vehicle trailers are often constructed from less corrosion resistant materials than the vessels they launch and retrieve. Bryham acknowledges this, teaching that the sea is often highly corrosive to the towing vehicle and its trailer and that the amphibious wheel system it teaches can be employed to solve such problems. *Id.*, 1:57-58.

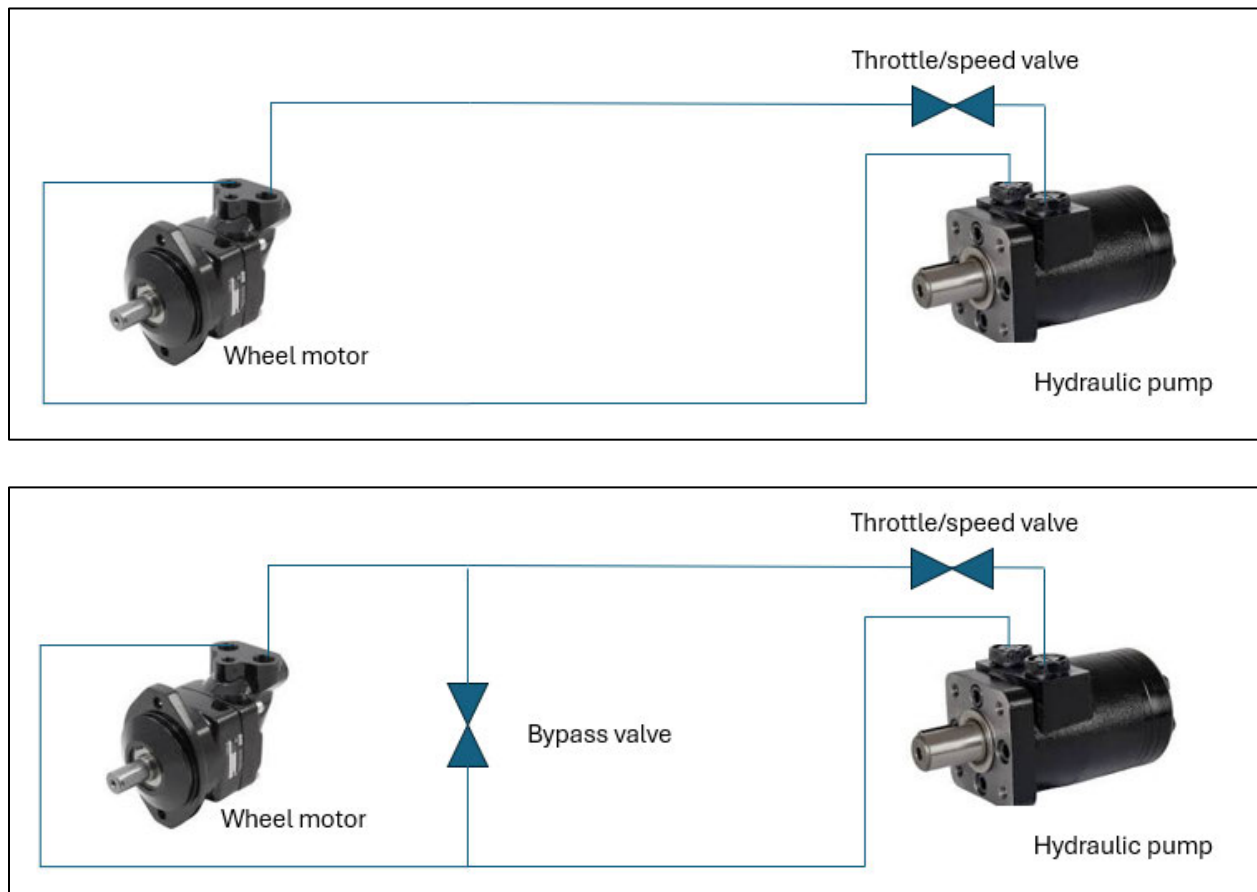
206. Additionally, a POSA would have understood that many vessels are constructed of non-corrosive materials or materials that are less-susceptible to corrosion, like fiberglass. In addition, a POSA would have understood that non-

fiberglass, metallic components of boats are often constructed from corrosion-resistant materials and are often bonded to protect them from corrosion. For example, one reference provides that “[t]he components of a thru-hull fitting or seacock shall be formed of galvanically compatible materials having the strength and resistance to corrosion necessary to withstand intended and abnormal use to which they are likely to be subjected.” EX1136, 8. In addition, a POSA would have understood that watercraft often have cathodic bonding conductors, sacrificial anodes, and/or impressed current protection systems to help protect vessel components from corrosion. EX1140, 11-13. A POSA would have understood that trailers are often constructed from steel because of its relatively low cost and relatively high strength, which is more susceptible to corrosion than the typical vessel construction materials. Further, a POSA would have understood that trailers are not typically protected with cathodic bonding, sacrificial anodes, or other corrosion protection measures. For these additional reasons, a POSA would have been motivated to add Bryham’s wheels, specifically designed for a corrosive environment, to the vehicle of Puck to improve its safety and utility and to eliminate the need for a trailer to be used in a corrosive manure lagoon environment. Therefore, contrary to Mr. Prairie’s opinions, the corrosive environment of a manure lagoon would motivate a POSA to add the amphibious wheels of Bryham to the Puck vehicle, as Bryham teaches.

207. Nuhn contends that adding hydraulically powered wheels to Puck's boat would not have solved the problem of retrieving the boat easier and safer because hydraulic systems for wheels lock and do not rotate when there is no hydraulic flow (if the hydraulic pump is not running). Paper 21 at 72. Nuhn asserts that this would impede retrieval and make it more difficult to retrieve than Puck's boat if it breaks down or runs out of gas, because the wheels will not turn. However, deposition testimony from Ian Nuhn illustrates that this "problem" is the result of the specific brake design used on Nuhn's Lagoon Crawler—*not* Puck or Bryham. There is no indication at all that Ian Nuhn has ever seen or inspected the commercial embodiment of Bryham. Mr. Nuhn testified that "[t]he wheels on the crawler are a spring-applied brake. And then we need hydraulic pressure to release them." EX1098, 264:8-10. However, as shown herein, this phenomenon and "problem" was neither necessary nor an inherent characteristic of hydraulically power wheel motors designs, as illustrated herein.

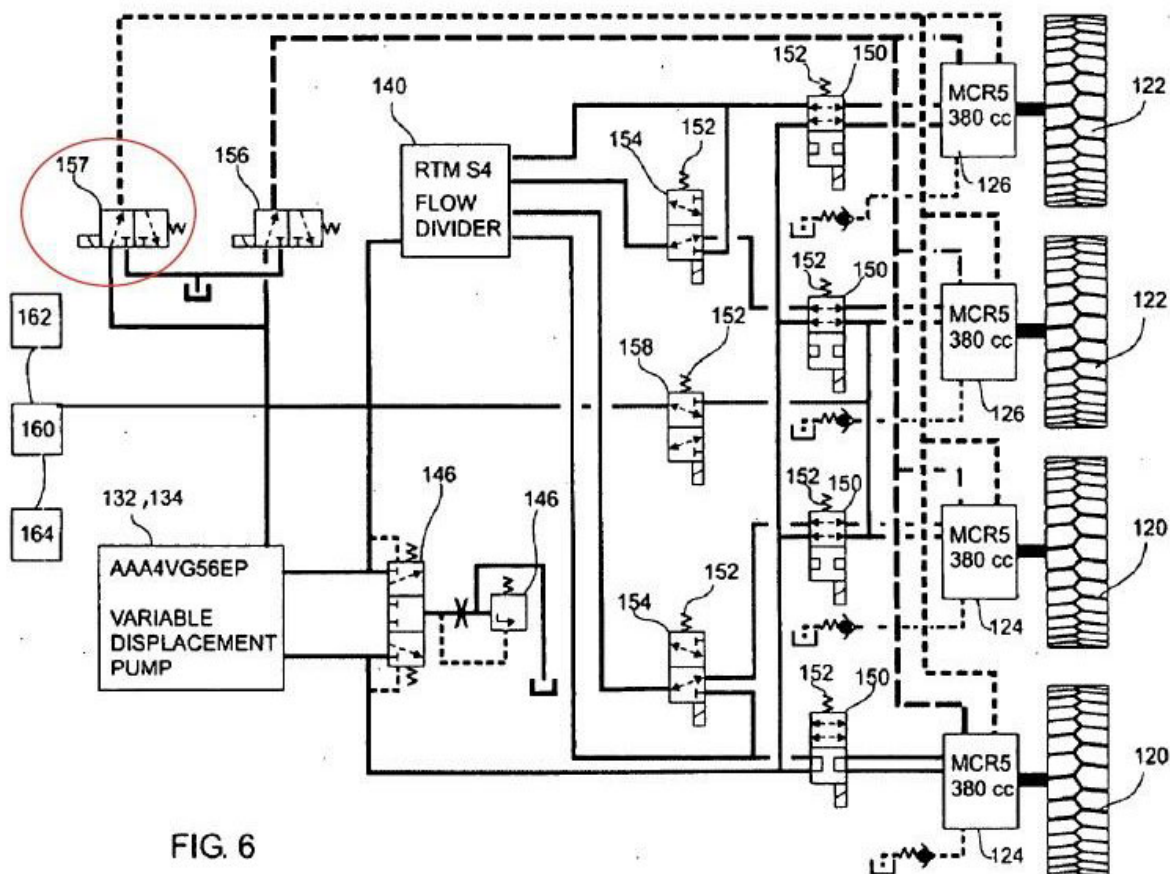
208. A simple schematic of a single wheel motor and a hydraulic pump system are illustrated below. A POSA would have understood that this system could be set up to operate in both directions using a system of conduits and valves and that the speed of the wheel motor could be regulated with a throttling valve or by varying the speed of the hydraulic pump. A POSA would have understood that a simple bypass valve could be integrated into the hydraulic circuit that would allow fluid to

readily pass through the hydraulic wheel motor and in a loop. In the second schematic below, a bypass valve is added. Opening the bypass valve would allow the wheel motors to spin freely and closing it would return control to the hydraulic pump system. This simple concept would have been understood by a POSA. Nuhn's basis for its arguments is rooted in a "problem" that is its own creation and unique to the Nuhn Lagoon Crawler's specific brake system configuration, and wholly absent from the prior art in question.



209. Carrier teaches a similar concept of using a valve to lock or unlock the wheel motors, to work as brake system. While the Carrier system exhibits the same

phenomenon Mr. Nuhn described in his declaration, Carrier incorporates a simple bypass valve to lock (“brake”) or unlock the wheels, using this phenomenon to its advantage rather than creating a design problem like the one Mr. Nuhn describes. Carrier teaches that a “second speed valve 156 and **brake valve 157** can be operably interposed between pump 130 and one of each of the wheel motors 124 and 126.” EX1005, ¶[0042] (emphasis added). A schematic of Carrier’s hydraulic wheel system is reproduced below indicating the brake valve 157.



Id., FIG. 6 (annotated).

210. A POSA would have understood that hydraulic valve systems can be opened or closed to lock or unlock hydraulic wheel motors, just like Carrier teaches with its “brake valve” above. Again, Nuhn’s “problem” and perceived deficiency is unique to its own product and the characteristics of the specific brake system it selected. It is wholly absent from the cited prior art. Just because Nuhn has not managed to resolve what it paints as a design defect in its own product, does not mean POSAs were unaware of these simple solutions. Nuhn’s assertions that the same problem with its design would necessarily plague all other vehicles in the same manner are wrong, especially since Ian Nuhn, the named inventor and designer of Nuhn’s product, lacks an engineering background.

211. For the reasons described herein, a POSA would have understood that adding the hydraulically powered amphibious wheels of Bryham to the Puck vehicle would make launching and retrieving the Puck vehicle both easier and safe.

F. A POSA Would Have Had a Reasonable Expectation of Success in Combining Bryham with Puck.

212. Nuhn and Mr. Prairie ignore the common understanding of a POSA, providing a scattershot of excessive, unsubstantiated, and meritless arguments regarding the reasonable expectation of success in combining Puck and Bryham. Below, I address each of these points and explain why all of them are wrong.

213. Nuhn argues that a POSA would not have had a reasonable expectation of success in combining Puck and Bryham. Paper 21 at 73-74. Nuhn argues about the stability of Bryham's wheels, the number of wheels powered, and the ability of the wheels to steer the vehicle. *Id.* In addition, Mr. Prairie argues about whether Bryham's wheels would interfere with Puck's dock sections and the ability of the Puck vehicle to be carried by Bryham's wheels. EX2099, ¶¶286-288. They are wrong on all points.

214. First, regarding the assertions that the combination would be inherently unstable and prone to tipping on steep lagoon embankments, Nuhn's and Mr. Prairie's arguments are based on specific 3-wheeled exemplary embodiments and images provided in Bryham rather than what a POSA would have understood from the complete teachings of Bryham. While Bryham does disclose an embodiment that incorporates a "vee-hull," Bryham also discloses a number of different watercraft styles that could be utilized with its amphibious undercarriage systems. A POSA would have understood that Bryham is not limited to just "vee-hull" boats. I understand that Maurice Bryham, the inventor of EX1015, confirmed this in his deposition. EX1138, 22:11-23:13.

215. A POSA would have understood that Bryham could be utilized with a variety of different watercraft, including those that are more barge-like in shape, for example, an airboat. Bryham teaches that "[p]referably the amphibious vehicle is

primarily a water-borne vehicle, for example but not limited to a boat, jet-boat, an inflatable boat, jet-ski, hydrofoil or air boat.” EX1015, 2:43-45. Bryham also teaches that “preferably the ground engaging means consist of *at least* three wheels.” *Id.*, 2:46-47 (emphasis added). A POSA would have understood that Bryham contemplates boxier “barge-like” air boat style configurations, which would lend themselves to a four-wheel configuration, rather than three. A POSA would have understood that air boats are not typically “vee-hulled” and are much flatter and boxier in shape and that they often have a broad up-turned bow.

216. Three-wheel and four-wheel amphibious configurations were known in the art, and a POSA would have been capable of deciding between these design choices and adapting either to the vehicle of Puck. Bryham contemplates configurations with more than three wheels and the processes of applying a four-wheeled version of Bryham would be straightforward and would yield predictable results. A POSA would have understood that the logical location for Bryham’s wheels would be at each corner of the frame 14 constructed of welded tubular steel pipes 16 of Puck, which is typical for wheels on four-sided vehicles and more stable than a three wheeled configuration on the same vehicle.

217. Further, EX1111, an article published in 2011, shows an all-wheel drive Sealegs vehicle and discloses that AWD provides “additional traction to significantly increase Sealegs’ capabilities on steep slippery inclines.” EX1111, 1.

As shown below, the Sealegs vehicle was readily capable of climbing inclines, and a POSA would not view it as inherently unstable and prone to tipping. I understand that Maurice Bryham, the inventor of EX1015, confirmed this in his deposition. EX1138, 16:7-17:23.



Id.

218. Mr. Prairie's criticisms and perceived shortcomings of the amphibious vehicle of Bryham and its limited capabilities are wrong. As explained below, a POSA would have understood the capabilities of the Bryham vehicle and the combination of Puck and Bryham to be quite different than Mr. Prairie suggests.

219. Contrary to Mr. Prairie’s assertion, a POSA would have understood that Bryham would be capable of climbing steep banks. Furthermore, a POSA would have understood that the ability to climb a steep embankment depends primarily on the vehicle having sufficient power/torque and the friction generated between the tires and the ground. Regarding the tires, given that Bryham teaches an amphibious vehicle designed to operate in wet environments, Mr. Prairie’s assertion that it would not work well on a “slippery embankment” is misplaced. Bryham teaches the use of all-terrain tires that would be well-suited for this purpose. Bryham teaches “[a]ll terrain balloon type tires are used to enable the boat to travel over a variety [of] shoreline terrain.” EX1015, Abstract. A POSA would have understood all-terrain tires to generally have an aggressive and often knobby tread layout for traction on a variety of surfaces. A POSA would have understood that the all-terrain tires of Bryham would be well-suited for traversing the embankments of a manure lagoon, contrary to Mr. Prairie’s opinions. I understand that Maurice Bryham, the inventor of EX1138, confirmed this in his deposition. EX1138, 16:7-17:23. The ’708 Patent does not teach any structure or feature that a POSA would have been understood to give it greater capabilities than Bryham for traversing “steep and slippery embankments,” as Mr. Prairie contends. EX2099, ¶¶289-290. An archived webpage of Bryham’s commercial embodiment confirms the all-terrain nature of the vehicle and its ability to navigate steep embankments. EX1111, 1.

220. Bryham also teaches that the “undercarriage assemblies can be extended in such a way as to give the amphibious vehicle stability when supported and/or traveling on the ground engaging means on a relatively wide range of shoreline terrain.” EX1015, 3:7-11. A POSA would have understood that Bryham’s operating environment, a wide range of shoreline terrain, would include wet, muddy, rocky, steep, and uneven terrains. *See* EX1111.

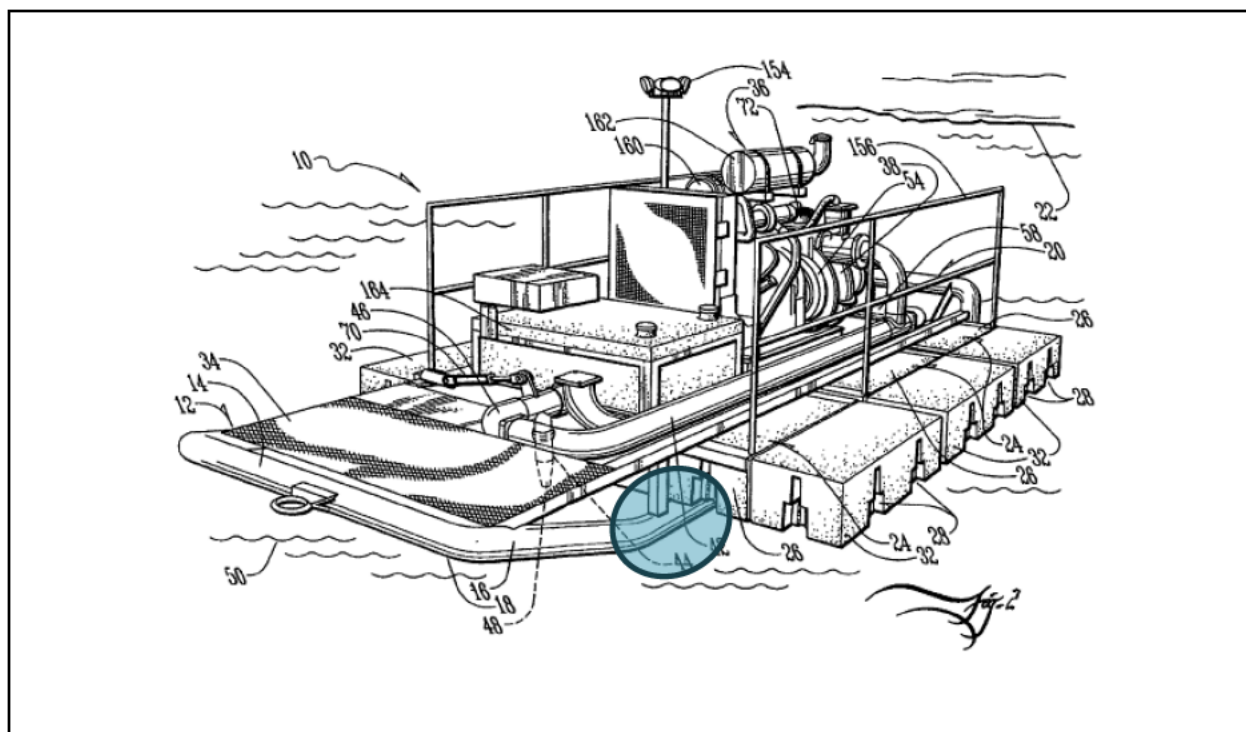
221. Second, regarding the allegations that the combination would have poor traction with only two-powered wheels and would get stuck, as explained above, Bryham teaches that all of the wheels can be powered (*supra* Section X.D), Bryham teaches configurations with more than three wheels (*supra* Section X.D), and Bryham teaches all-terrain type tires (*supra* Section X.F). And as illustrated in an image from an archival 2011 article, a POSA would not have understood the vehicle to have poor traction. EX1111, 1.

222. Third, regarding the assertions that the “one small front wheel” would be prone to sliding and would be ineffective in turning the vehicle, Nuhn provides no basis for its conclusory assumptions that the front tire of Bryham is undersized. Bryham does not disclose that any of its drawings are to scale. I understand that unless otherwise noted, patent drawings are not to scale. From the images of Bryham, a POSA would have understood that the front tire of Bryham is approximately the same size as the rear; a POSA would not have concluded that the

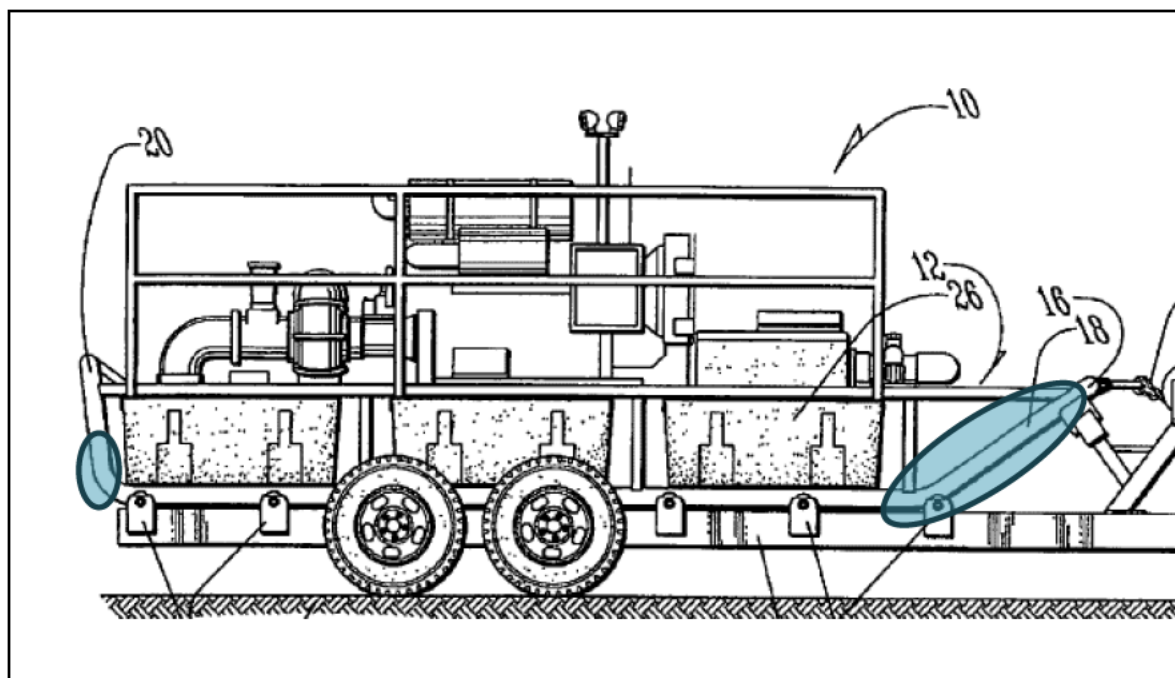
front tire is too small and would be ineffective in turning the vehicle in a wet environment. EX1015, FIG. 1. Mr. Prairie, without basis, concludes that the Bryham vehicle would generally be incapable of performing its disclosed function of traversing a variety of shorelines and surrounding terrains. EX2099, ¶¶352-353; EX1015, Abstract, 18:47-48. In contrast, a POSA would have understood from the explicit teachings of Bryham that the vehicle is steerable, and that the vehicle is capable of traversing a variety of shoreline terrains. Bryham teaches all-terrain tires (EX1015, Abstract). Nuhn's assertions that the Puck and Bryham combination would have an undersized front tire with poor traction that would be incapable of steering the vehicle are entirely baseless.

223. Fourth, Mr. Prairie contends that the combination may not be successful because Bryham's wheels would interfere with the modular dock sections of Puck. EX2099, ¶¶262, 286, 501. Mr. Prairie is wrong. He does not provide any drawings or analysis to support his position that the wheels of Bryham would necessarily interfere with the dock sections of Puck, or why they would need to occupy the same space. Alternately, even if the addition of Bryham's wheels would somehow interfere with the dock sections, Mr. Prairie has not offered any explanation why a POSA would not have a reasonable expectation of success in moving or adjusting the wheel attachment points or dock section geometry using their ordinary problem-solving skills to provide a functional combination.

224. Mr. Prairie is also wrong because he has not demonstrated that there is any need for the wheels to occupy the same space as the dock sections. Furthermore, a POSA would have known how to select a reasonable attachment point for the amphibious wheels of Bryham to the vehicle of Puck. Puck offers a natural choice for attaching Bryham's wheels, which is to the frame of the vehicle identified as reference numbers 14, 16, 18, and 20 in the images below. A POSA would have understood that a natural choice for attaching the wheels of Bryham to the vehicle of Puck would be to place a pair of wheels toward the forward end of the vehicle and a pair of wheels toward the back end of the vehicle and attach one wheel of each pair to the frame on either side of the vehicle. The general areas which a POSA would have understood would be natural choices for attaching the wheels of Bryham in a four-wheeled configuration to the Puck vehicle are illustrated below. In sum, these attachment points on the Puck frame are forward of and aft of the floating dock sections and there is no reason why they would interfere at all. A POSA looking at Bryham would have understood that the wheels at the aft end could retract by rotating aft, away from the dock sections, and similarly, the wheels at the front end could retract by rotating forward, also away from the dock sections.



EX1014, FIG. 2 (annotated).



Id., FIG. 8 (annotated).

225. Fifth, Mr. Prairie asserts that Puck’s vessel is not designed so that its weight can be carried at 3-discreet points. EX2099, ¶287. This argument is without basis and starts with the false premise that Bryham and the combination of Puck and Bryham would be limited to only three wheels. It is not—a POSA would have understood to implement four wheels as discussed above. Regardless, Puck teaches that it includes a “frame (14) preferably constructed of welded tubular steel pipes (16).” EX1014, ¶[0022]. Whether constructed with three or four wheels, Mr. Prairie has provided no basis why the Puck vehicle could not be carried at three discreet points. In fact, the Puck vehicle is designed to be pulled out of a lagoon and lifted onto a trailer by a winch attached to a single point on the front of the vehicle. *Id.*, ¶[0038]; FIG. 9. Mr. Prairie’s assertion that the vehicle, which is welded out of steel pipes and is designed to be pulled out of a lagoon from one discreet point, could not be carried at three discreet points is unsupported and illogical.

226. Sixth, Mr. Prairie contends that the dock sections of Puck are not designed to be held together when raised off of the surface of the lagoon. EX2099, ¶288. Mr. Prairie’s argument is again without merit. Initially, a POSA would have understood that Puck contemplates configurations other than floating dock sections for buoyancy. For example, Puck teaches that “[t]he vessel (12) may alternatively be constructed of any suitable material or may be constructed with a more standard hull.” EX1014, ¶[0022]. Regardless, a POSA would have understood that the

modular dock sections of Puck, and their connections to the vehicle and frame, would be sufficiently strong that they would not fall apart under their own weight when lifted out of the water. Mr. Prairie has done nothing to show that the dock sections of the Puck vehicle would fall apart if they were “suspended above the ground.” EX2099, ¶288. This is speculative and inconsistent with the teachings of Puck, which provides that “[t]he frame (14) defines a plurality of receiver slots (24) into which are provided modular dock sections (26), such as those known in the art.” EX1014, ¶[0022]. A POSA would have understood from the teachings of Puck that the dock sections of Puck are fitted within receiver slots which would hold the floating dock sections and transmit the buoyant forces to the frame of the vehicle.

227. Similarly, a POSA would have understood that the vehicle of Puck could be constructed of a different material and/or using “more standard hull” design. *Id.* A POSA would have understood that more standard watercraft hull designs would include fiberglass and metal constructions and a variety of shapes, including “vee-shaped” hulls. Mr. Prairie has not demonstrated that the more standard hull designs contemplated by Puck would fall apart under their own weight when lifted out of the water. Moreover, a POSA would have understood that the dock sections would not be the natural choice as an attachment point for the wheels of Bryham to the Puck vehicle and would not be required to support the weight of the vehicle. A natural choice for attaching the wheels, which would support the

vehicle out of the water and while transitioning between modes, would be Puck's frame made of "welded tubular steel pipes," (*id.*) rather than to the floating dock sections themselves.

228. In sum, the numerous arguments put forth by Nuhn and Mr. Prairie for concluding that the combination of Puck and Bryham would not have a reasonable expectation of success have been demonstrated to be counterfactual, misleading, and in some instances, completely imagined. These arguments are contrary to the explicit teachings in the art and contrary to what a POSA would have understood.

G. Dependent Claims 18, 24-26, and 35-38.

229. Claims 18, 24-26, and 35-38 each depend from one of claims 17, 21 or 23. Neither Nuhn nor Mr. Prairie provide any analysis or opinion regarding these claims and obviousness over Puck in view of Bryham, aside from referring back to previous claims from which they depend.

230. As discussed in my prior declaration, it is my opinion that these claims are obvious over Puck in view of Bryham. EX1004, Section X.

XI. GROUND 5: CLAIMS 17-18, 23-26, AND 35-38 ARE RENDERED OBVIOUS BY THE COMBINATION OF PUCK AND BRYHAM AND BENNETT-II

231. Nuhn asserts that the combination does not render claims 17-18, 23-26, and 35-38 as obvious because Bennett-II does not teach: (1) a vehicle or a boat with four wheels with buoyant elements situated between the front and rear wheels on

each side of the vehicle, (2) with a power source configured to provide power to both the ground engaging propulsion structure and the pump, (3) four variable speed hydraulic motors, one per wheel, and (4) wireless remote control using Puck's remote-control system to control Bryham's wheels. Paper 21 at 57-69. Nuhn is wrong on all points.

232. In addition, Mr. Prairie discusses the motivation to combine and expectation of success regarding the Puck, Bryham, and Bennett-II combination. EX2099, ¶¶335-355. However, this discussion is generally a regurgitation of the same arguments made with respect to Claim 4. As explained previously, Mr. Prairie and Nuhn are incorrect in their assertions regarding the motivation to combine and expectation of success in combining Puck and Bryham. *Supra* Sections X.E and X.F.

233. While Mr. Prairie makes arguments about the relative traction and steering capabilities of Bennett-II and Bryham (EX2099, ¶355), this is completely irrelevant. A POSA would have had a reasonable expectation of success in implementing remote control, as taught by Bennett-II, to provide remote control of Bryham's wheels. Mr. Prairie's assertions otherwise are based on flawed assumptions and do not demonstrate that a POSA would not have had a reasonable expectation of success in combining the Bryham wheels and the remote-control system of Bennett-II with the Puck vehicle.

A. The Combination of Puck, Bryham, and Bennett-II Discloses Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle.

234. The combination of Puck, Bryham, and Bennett-II discloses buoyant elements positioned between the front wheel and rear wheel on each side of the vehicle for the same reasons explained above. *Supra* Section X.A.

B. The Combination of Puck, Bryham, and Bennett-II Disclose a Power Source Configured to Provide Power to Both the Ground Engaging Propulsion Structure and the Fluid Pump.

235. Nuhn and Mr. Prairie dispute whether powering separate components with a single engine would be cheaper, more efficient, take up less space, and weigh less. As demonstrated above, POSAs understood these advantages with using a single engine to power multiple components and would have been motivated to do so. *Supra* Section X.B.

236. Furthermore, Bennett-II teaches an amphibious vehicle with a single power source, which is configured to power the ground engaging propulsion structure, hydraulic pump, and auxiliary propulsion pumps. EX1017, ¶¶[0079], [0082]-[0083]. Bennett-II provides that “gearbox 510 drives an attachment shaft 511 for transferring engine torque to an attachment or implement (e.g., a work tool) attached to vehicle 10.” *Id.*, ¶[0079]. Bennett-II provides an embodiment where “attachment shaft 511 is used to drive a jet pump and/or propeller member to assist in propelling vehicle in water during amphibious operation.” *Id.* A POSA would

have understood that there are benefits to powering multiple systems with a single power source, including auxiliary fluid pumps and the ground engaging propulsion structure. *Supra* Section X.B.

237. A POSA would have been motivated to power the ground engaging propulsion structure of Bryham using the engine of Puck's vehicle, as taught by Bennett-II, because of these same benefits. A POSA would have been motivated to power a hydraulic pump using Puck's engine to provide power to the ground engaging wheels of Bryham and the slurry pump of Puck. *Supra* Section X.B. The addition of Bennett-II's remote control system would provide control of hydraulic fluid to the hydraulic motors of Bryham in the same manner that Bennett-II employs a series of valves for regulating the flow of hydraulic fluid to control its ground engaging propulsion system.

C. The Combination of Puck, Bryham, and Bennett-II Disclose all the Remote Control Limitations.

238. Regarding Bennett-II, Nuhn alleges that the teachings of Bennett-II would not inform a POSA that Puck's remote-control system could be modified to control Bryham's ground engagement system. Paper 21 at 67-69. Mr. Prairie bases his arguments on his perceived differences between Bryham's and Bennett-II's ground engaging propulsion structure. EX2099, ¶355. However, as explained above,

these propulsion structures include many of the same common features that would be similarly controlled using the remote control of Bennett-II. *Supra* Section X.C.

239. Nuhn argues that, while Bennett-II discloses remote control of an amphibious vehicle's ground engaging propulsion structure, a POSA would not have understood how to implement such a remote control on the wheels of Bryham. These allegations are once again belied by the bare description of the remote control in the '708 Patent itself, which further shows the ubiquitous and generally known nature of remote-control systems when Nuhn filed its provisional patent application.

240. Bennett-II teaches an amphibious vehicle with a hydraulic drive system for controlling differential speeds and steering of the vehicle tracks. EX1017, ¶¶[0083], [0092], [0099].

241. Bennett-II describes how the vehicle can be controlled on land with a remote control. EX1017, ¶¶[0043], [0121]. Bryham teaches wheels that are powered with hydraulic energy and that the hydraulic wheel motors are driven "via valves." EX1015, 16:1-6. Like Bryham, the hydraulic drive motor for steering the Bennett-II tracks is controlled by valves. EX1017, ¶¶[0093]-[0094]. A POSA would have understood that to remotely control the vehicle on land, as taught by Bennett-II, the remote control of Bennett-II would adjust the position of the valves 612, 614, 616, 618 to regulate the flow of hydraulic fluid and selectively power the Bennett-II tracks. *Id.* A POSA would have understood that the remote control of Bennett-II,

which controls valves to selectively provide hydraulic flow to a hydraulic drive motor, could equally be used to control the hydraulic flow to the hydraulic wheel motors of Bryham. A POSA would have understood that, as disclosed by Puck, the remote control could vary the position of such valves to operate the ground engaging propulsion structure at variable speed and direction. EX1014, ¶¶[0033], [0037]; *supra* Section X.C.

242. Nuhn argues that remote control of the Bryham ground engaging propulsion structure would require substantial modification. However, Bennett-II's remote control system is already configured to regulate the flow of hydraulic fluid to control the ground engaging propulsion structure. EX1017, ¶¶[0043], [0093]-[0096], [0121]. This is the same mechanism for controlling the wheels of Bryham. EX1015, 16:6-12. Thus, a POSA would therefore have understood that the remote-control system of Bennett-II could easily be used to control the ground engaging propulsion system of Bryham with minimal modification required and a POSA would have reasonable expectation of success.

D. POSA Would Have Had a Reasonable Expectation of Success in Combining Puck, Bryham, and Bennett-II.

243. The arguments presented by Nuhn and Mr. Prairie regarding the Puck, Bryham, and Bennett-II combination are generally the same as those for the Puck

and Bryham combination. Nuhn and Mr. Prairie are incorrect in their assertions for the same reasons as I have described above. *Supra* Section X.F.

244. Mr. Prairie asserts that the teachings of Bennett-II would not inform a POSA that Puck's remote-control system could be modified to control Bryham's ground engagement system. EX2099, ¶¶332, 355. Mr. Prairie bases his arguments on his perceived differences between Bryham's and Bennett-II's ground engaging propulsion structure. *Id.* However, as explained above, these propulsion structures include many of the same common features that would be similarly controlled using the remote control of Bennett-II. *Supra* Section X.C. Mr. Prairie's arguments about the relative traction and steering capabilities of Bennett-II and Bryham are irrelevant as to the motivation of a POSA to combine the Bennett-II remote control with the Bryham wheels and with the Puck vehicle and remote-control system.

E. Dependent Claims 18, 24-26, and 35-38.

245. Claims 18, 24-26, and 35-38 each ultimately depend from one of claims 17, 21, or 23. Neither Nuhn nor Mr. Prairie provide any analysis or opinion regarding these claims and obviousness over Puck in view of Bryham and Bennett-II, aside from referring back to previous claims from which they depend. EX2099, ¶359.

246. As discussed in my prior declaration, it is my opinion that these claims are obvious over Puck in view of Bryham and Bennett-II. EX1004, Section XI.

XII. GROUND 6: CLAIMS 1-38 ARE RENDERED OBVIOUS BY THE COMBINATION OF TRUXOR, YOON OR CARRIER, AND MANURE-MANAGER

247. Claims 1-38 of the '708 Patent are rendered obvious by Truxor in view of Yoon or Carrier in view of Manure-Manager. Truxor in view of Yoon or Carrier render obvious claims 1, 8-18, 21-28, and 35-38 for the reasons discussed above. *Supra* Section VIII. The addition of Manure-Manager renders obvious claims 2-7, 19-20, and 29-34. EX1004, Section XII. A POSA would have been motivated to add Manure-Manager to take advantage of the efficiency and durability capabilities described by Manure-Manager and other publications.

248. Mr. Prairie argues that the Truxor-Manure-Manager combination fails to disclose or suggest buoyant elements positioned between wheels, the arguments are merely a regurgitation of the same arguments made with respect to Truxor and Yoon or Carrier. *Compare* EX2099, Section XVII.A.1 *with* Section XIII.A.2. As discussed above, Truxor and Yoon or Carrier render these features obvious. *See supra* Section VIII.A.

A. A POSA Would Have Been Motivated to Combine Truxor, Yoon or Carrier, and Manure-Manager.

249. A POSA would have been motivated to substitute the Nuhn Pump for the Doro Pump given its advertised efficiency and durability benefits. EX1004, Section XII.A.

250. Nuhn and Mr. Prairie argue that a person looking to increase the efficiency and durability of the pump of Truxor would not have looked to Manure-Manager because the Nuhn Pump described in Manure-Manager was not “designed, advertised, or proven for dredging operations.” EX2099, ¶381. Nuhn and Mr. Prairie are wrong.

251. Nuhn argues that dredging pumps are not robust enough to handle liquid manure (Paper 21 at 27) while, simultaneously, suggesting that Nuhn’s Pit Pump could not be capable of dredging (*id.* at 35). Nuhn cannot have it both ways. A POSA would have understood that there is considerable overlap between dredging and manure pumping applications given the use of pumps for both applications. Both the Doro Pump and the Nuhn Pump are structurally similar, as they are each centrifugal pumps with bottom fluid inlets, impeller housings, vertically oriented driveshafts. Nuhn has not identified any structural differences that would render the Nuhn Pump unable to perform the dredging functions of the Doro Pump. According to Nuhn, “liquid manure pumps” such as the Nuhn Pump are capable of pumping higher solid content fluids than dredging pumps, such as the Doro Pump. Paper 21 at 27. Indeed, I understand that Ian Nuhn, the inventor of the ’758 Patent, of which the Nuhn Pump is a commercial embodiment, testified that the Nuhn Pump is designed to pump material from the bottom of liquid manure lagoons (EX1096, 62:5-16), including sand-laden slurries (EX1096, 55:4-15) and “lagoons where it

was solid pretty much all the way through.” EX1096, 51:12-52:5. Given the similar designs and structural features noted above, and the high solid content pumping capabilities of the Nuhn Pump, a POSA would have understood that the Nuhn Pump could be substituted for the Doro Pump to provide enhanced solids pumping capabilities, improved efficiency and reduced wear, thereby increasing the effectiveness of the Truxor vehicle in dredging applications.

252. Nuhn also provides arguments about the intended placement of manure lagoon agitation pumps, stating that they are “designed to be placed and operated in the middle of the ‘water’ column.” EX2099, ¶¶378-379. While circumstances may exist where it would be desirable to position the pump in the “middle of the water column,” Nuhn’s own pump patent (EX1032, incorporated by reference in the ’708 Patent) is designed with a bottom rest 24 that is intended to be placed on the bottom of the fluid reservoir. EX1032, 6:3-7. A POSA would have understood that manure in reservoirs can stratify and that solids can accumulate and concentrate on the bottom of manure storages. A POSA would have understood that the pump disclosed in EX1032 is designed to be positioned at the bottom of manure reservoirs where higher concentrations of solids accumulate. Nuhn’s arguments that the Nuhn Pump was not designed, validated, or advertised to be used in dredging ring hollow. A POSA would have understood from the plain teachings of the ’708 and ’758 Patents, and the common structural features between the Nuhn Pump and the Doro Pump,

that the Nuhn Pump was intended to pump the higher solids concentration sludge at the bottom of manure storages and would be well suited for dredge applications.

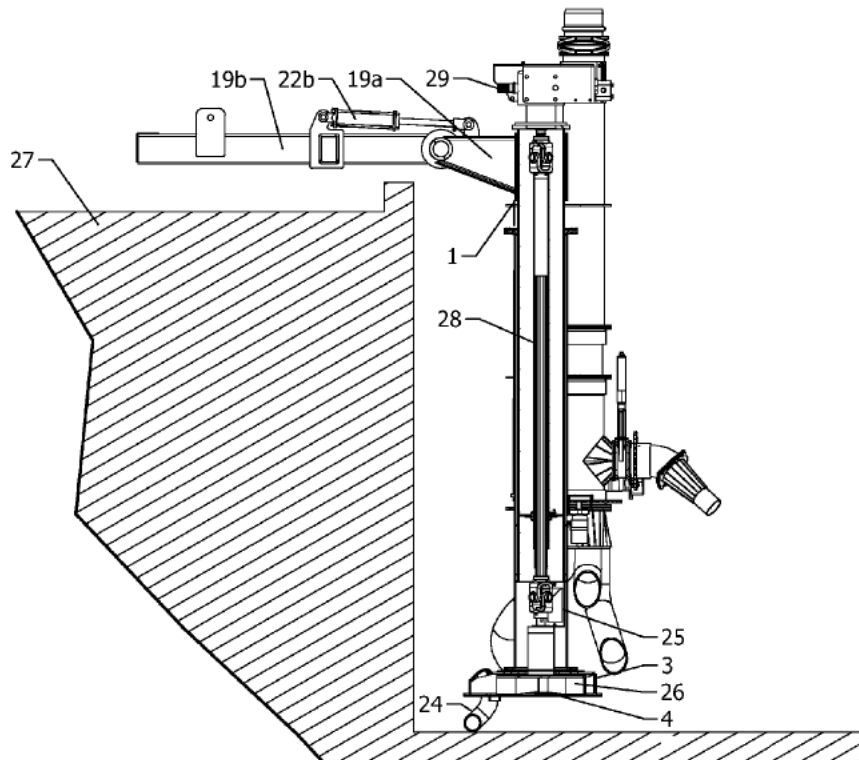


FIG. 2

EX1032, FIG. 2.

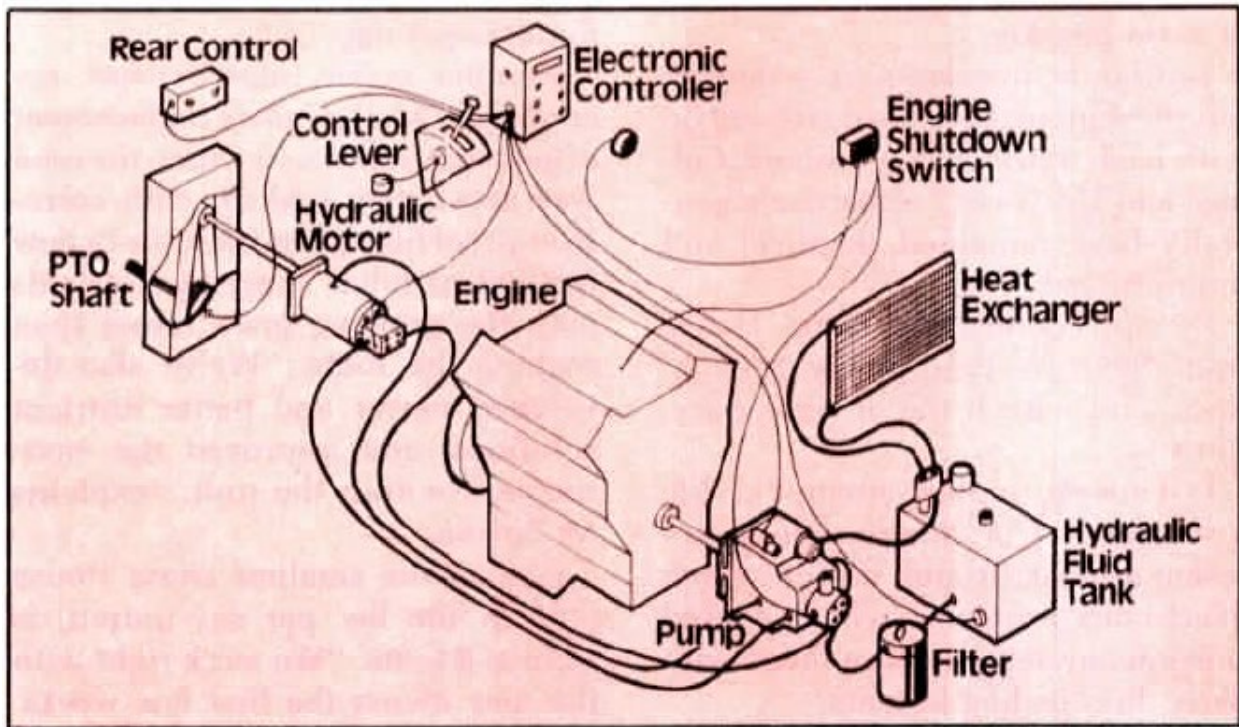
253. Nuhn's own statements regarding the relative capabilities of dredging pumps and liquid manure pumps, along with its own patent literature, contradict its arguments that a POSA would not have been motivated to substitute the Nuhn Pump for the Doro Pump. As previously described, a POSA would have been motivated to

substitute the Nuhn Pump for the Doro Pump given its advertised efficiency and durability benefits. EX1004, Section XII.A.

B. A POSA Would Have Had a Reasonable Expectation of Success in Combining Truxor, Yoon or Carrier, and Manure-Manager.

254. Nuhn and Mr. Prairie argue that a POSA would not have had a reasonable expectation of success in substituting the Nuhn Pump for the Doro Pump because (1) the hydraulic transmission of Truxor could not power the Nuhn Pump PTO input, (2) the Truxor Doro Pump and Nuhn Pump have different horsepower input/outputs, and (3) the Nuhn Pump is larger and heavier than the Doro Pump. EX2099, ¶¶384-386. Nuhn and Mr. Prairie are wrong on each of these points.

255. First, Nuhn is wrong in arguing that Truxor's hydraulic transmission could not be configured to power the PTO input of the Nuhn Pump. As Mr. Prairie acknowledged in his declaration submitted in conjunction with Nuhn's Patent Owner Response in the '425 Patent IPR, such hydraulic transmissions were well known for powering PTO driven implements (such as the Nuhn Pump) since the 1970s. IPR2023-01161, EX2029, ¶172. One example, cited by Mr. Prairie, is provided below:



EX1107, 18.

256. As illustrated in the figure above, one advantage to this configuration is that the position of the hydraulic motor and its associated power output shaft can be easily adjusted to accommodate the relative positioning of the power input of whatever implement is being driven by the hydraulic transmission. *See* EX1107, 18. Thus, a POSA would have understood that the Nuhn Pump could easily be powered using such a hydraulic transmission of Truxor.

257. POSA would have recognized that the Nuhn Pump drive shaft could receive power from Truxor's hydraulic motor, in the same way that it powers the Doro Pump drive shaft. Nuhn's argument that the Nuhn Pump could not be powered by Truxor's hydraulic motor is belied by the '758 Patent which teaches that the

immersible pump incorporated by reference in the '708 Patent can be driven by “a hydraulic motor connected to the impeller.” EX1032, 2:28-29.



EX1006, 10; EX1019, 27.

258. Nuhn and its expert also argue about the horsepower and power transmission requirements for the Nuhn Pump. But Nuhn’s own product literature shows that the Nuhn Pump is capable of providing 4500GPM at the 35 horsepower

of Truxor's engine. EX1083, 8. Thus, a POSA would have understood that the Nuhn Pump could be powered using the Truxor engine and could produce significant volumetric flow rates, including the 4500 GPM produced with 35 horsepower as provided in Nuhn's own product literature.

259. Nuhn also argues about the compatibility of Truxor's pivoting boom arm and the relative size of the Nuhn Pump with respect to the Truxor DM5000. However, a POSA would have understood that the pivoting boom arm of the Nuhn Pump is not required when attaching the Nuhn Pump to the Truxor vehicle. Likewise, a POSA would have understood that the purpose of the elongated pump body and extended drive shaft 28 of the Nuhn pump is to permit the pump to extend to different depths within a reservoir. The incorporated-by-reference '758 Patent recognizes this, noting that the length of the pump body and shaft 28 is adjustable. EX1032, 6:14-16.

260. A POSA would have recognized that the extended body and driveshaft of the Nuhn Pump would be unnecessary when connecting the Nuhn Pump to Truxor, as the DM5000 includes an adjustable lift arm for positioning the pump at a desired depth. Thus, a POSA would have understood that by removing the pivoting boom arm of the Nuhn Pump and reducing the size of the elongated body, the Nuhn pump could be sized to be compatible with the Truxor vehicle. Regardless, a POSA would have understood that either of these components are scalable in size (i.e. the

Truxor lift arm/engine or the Nuhn Pump) and could be scaled to accommodate each other.

261. As Nuhn itself recognizes, a POSA would have understood that pumps are scalable in size. IPR2024-00004, Paper 22 at 15. A POSA would have also understood that centrifugal pumps can be scaled up or down in size to pump higher or lower volume flow rates. *See* EX1134, 4-5. For example, a pump manufacturer may offer the same pump design over a wide range of sizes and capacities. *Id.* Thus, a POSA would have recognized that the Nuhn Pump could be scaled in size to accommodate any discrepancy in size between the Nuhn Pump and the Truxor vehicle.

262. Mr. Prairie's remaining arguments about the reasonable expectation of success merely regurgitate arguments made in relation to the Truxor and Yoon or Carrier combination. As discussed above, a POSA would have been motivated to combine Truxor and Yoon or Carrier with a reasonable expectation of success. *Supra* Section VIII.C.

C. Dependent Claims 2-16, 18-20, 22, and 24-38.

263. Claims 2, 4-6, 8-15, 18, 22, and 24-29, 31-33 and 35-38 each depend from one of claims 1, 17, 21, or 23. Neither Nuhn nor Mr. Prairie provide any analysis or opinion regarding these claims and obviousness over Truxor, Yoon or

Carrier, and Manure-Manager, aside from referring back to previous claims from which they depend.

264. As discussed in my prior declaration, it is my opinion that these claims are obvious over Truxor in view of Yoon or Carrier and Manure-Manager. EX1004, Section XII.

265. As for claim 16, Truxor renders this claim obvious for the reasons discussed above. *Supra* Section VIII.E.

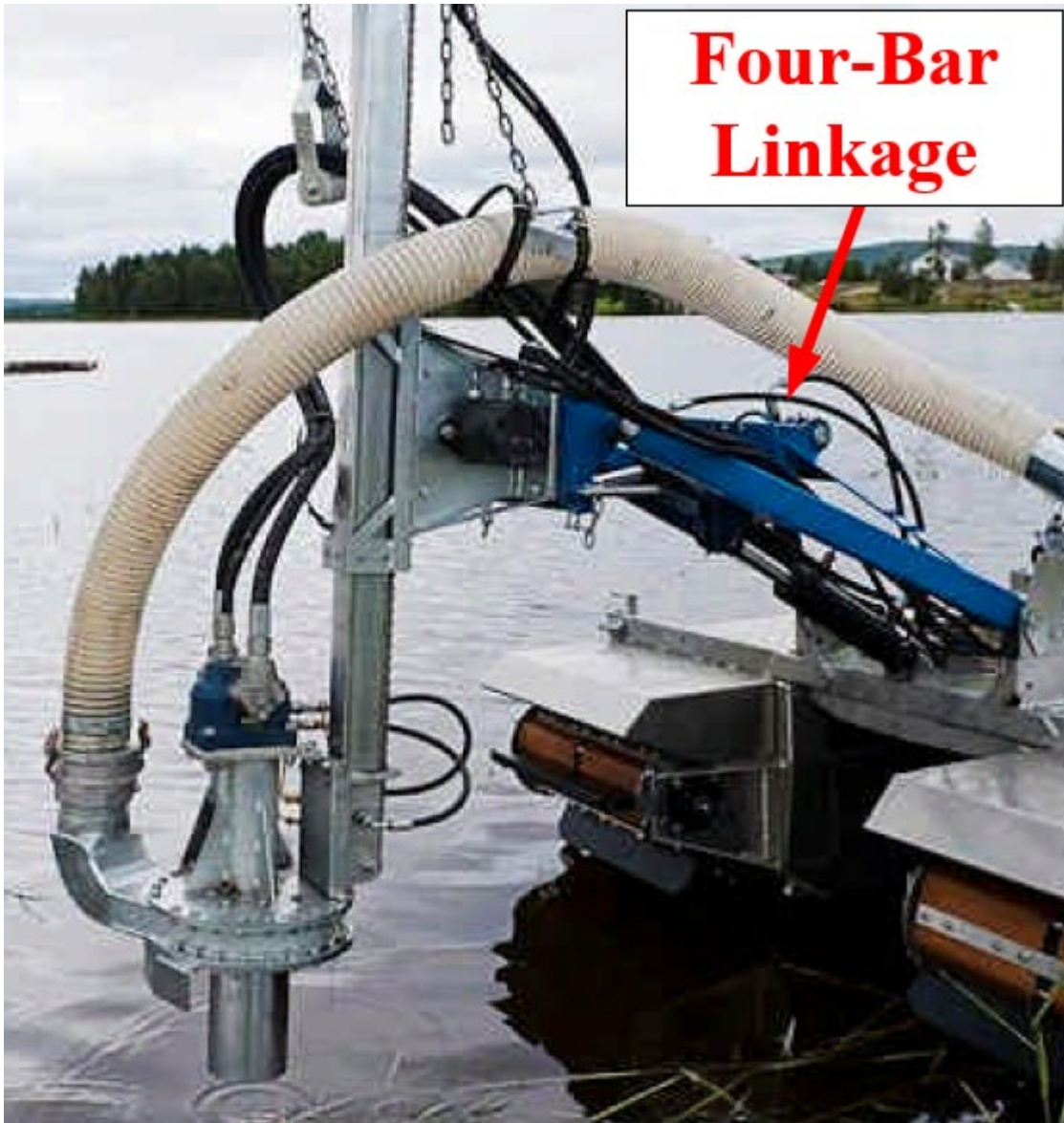
266. As for claims 3, 19, and 30, Nuhn and Mr. Prairie argue that Manure-Manager and Nuhn's Pit Pump does not have a flexible connection between the tangential outlets and the combiner. EX2099, ¶411. There is no established criterion for what is considered flexible or inflexible, as the term is used in the '708 Patent claims. While the material from which the conduits of the Nuhn Pump are constructed is not specifically disclosed in Manure-Manager, all materials have a modulus of elasticity and are deformable and flexible to some degree.

267. Regardless, a POSA would have been motivated to consider flexible conduits between the tangential fluid outlets and the combiner. A POSA would have understood that centrifugal pumps, like those used for pumping manure, often produce noise and vibration during operation. EX1130, 3. A POSA would have understood that vibration in pump systems can arise for a variety of reasons, including, impeller vane/blade passage, rotational imbalance or misalignment, or

hydrodynamic effects. EX1130, 3-13. A POSA would have understood that the piping system will have one or more natural frequencies that, if matched by vibration and excitation frequencies, can lead to failures and increased wear. A POSA would have understood that flexible connections may be used to mitigate vibration and reduce vibration transmission through a structure, such as a system of conduits, i.e. pump piping system. EX1130, 50. By modifying the stiffness of a piping system, i.e. by making it more flexible, a POSA would have understood that the natural frequency of the system would change and could be lowered to avoid the excitation frequencies of the pump, for example, the blade passage frequency. In addition to modifying the overall response of the system, the flexible conduits would act as vibration isolators which could mitigate any unwanted vibration downstream of the flexible conduits. A POSA would have understood that vibration mitigation and isolation strategies are beneficial because they can prevent or reduce the chances of vibration induced fatigue failures in various materials. Accordingly, a POSA would have been motivated to provide flexible fluid conduits between the tangential outlets and the combiner in Manure Manager to minimize noise and vibration and to reduce the chances of vibration-induced failure modes and material fatigue.

268. As for claims 7, 20, and 34, Manure-Manager discloses a nozzle with an articulation cylinder coupled to a linkage. Truxor discloses a front lift that utilizes a four bar linkage for adjusting the angle of the tool. A POSA would have understood

it to be obvious to utilize this four-bar linkage to control the angle of the fluid outlet. Such linkages were well known in the art for extending the stroke length of a cylinder. *See, e.g.*, EX1108, 52-58.



EX1006, 10 (annotated).

XIII. GROUND 7: CLAIMS 1-38 ARE RENDERED OBVIOUS BY THE COMBINATION OF SENWATEC, YOON OR CARRIER, AND MANURE-MANAGER

269. Claims 1-38 of the '708 Patent are rendered obvious by SenwaTec in view of Yoon or Carrier in view of Manure-Manager. SenwaTec in view of Yoon or Carrier render obvious claims 1, 8-18, 21-28, and 35-38 for the reasons discussed above. *Supra* Section IX. The addition of Manure-Manager renders obvious claims 2-7, 19-20, and 29-34. EX1004, Section XII. A POSA would have been motivated to add Manure-Manager to take advantage of the efficiency and durability capabilities described by Manure-Manager and other publications.

270. Mr. Prairie argues that the SenwaTec-Manure-Manager combination fails to disclose or suggest buoyant elements positioned between wheels. These arguments are merely a regurgitation of the same arguments made with respect to SenwaTec and Yoon or Carrier. *Compare* EX2099, Section XVIII.A.1 *with* Section XIV.A.2. As discussed above, SenwaTec and Yoon or Carrier render these features obvious. *See supra* Section IX.A.

A. A POSA Would Have Been Motivated to Combine SenwaTec, Yoon or Carrier, and Manure-Manager.

271. Nuhn and Mr. Prairie simply repeat the same incorrect arguments regarding the motivation to combine Manure-Manager with SenwaTec as they make with respect to the Truxor-Manure-Manager combination. *Compare* EX2099,

Section XVIII.A.2 *with* Section XVII.A.2. As discussed above, a POSA would have had a motivation to combine Manure-Manager with Truxor. *Supra* Section XII.A. Nuhn and Mr. Prairie's arguments pertaining to SenwaTec are wrong for the same reasons.

272. Furthermore, given that SenwaTec was publicly described as being used for sewage agitation purposes (EX1031; EX1029-EX1030; EX1072-1074; EX1077-EX1078), a POSA would have understood that the Nuhn Pump would be beneficial due to Nuhn's advertisements, which specifically describe the enhanced manure pumping capabilities of the Nuhn Pump and improved durability. *Supra* Section XII.A.

B. A POSA Would Have Had a Reasonable Expectation of Success in Combining SenwaTec, Yoon or Carrier, and Manure-Manager.

273. Nuhn and Mr. Prairie simply repeat the same incorrect arguments regarding the expectation of success in combining Manure-Manager with SenwaTec as they make with respect to the Truxor-Manure-Manager combination. *Compare* EX2099, Section XVIII.A.3 *with* Section XVII.A.3. As discussed above, a POSA would have had an expectation of success in combining Manure-Manager with Truxor. *Supra* Section XII.B. Nuhn and Mr. Prairie's arguments pertaining to SenwaTec are wrong for the same reasons.

274. As noted above, a POSA would have understood that the extraneous features of the Nuhn Pump, including the pivoting tractor mount and extended housing/driveshaft, could be omitted or shortened to render the pump more suitable for implementation on the Amphi-King. While Nuhn argues that its pump has a minimum power input of 95HP, this is contradicted by its own product literature. EX1083. The Amphi-King, which can provide 67HP, would be capable of powering the Nuhn Pump at approximately 5500 GPM. EX1083, 8. As recognized by Nuhn's expert, POSA would have understood that hydraulic transmissions were commonly used to power PTO driven components since at least the 1970s. *Supra* Section XII.B. Therefore, powering the Nuhn Pump with the hydraulic motor of SenwaTec would be straight forward and yield predictable results.



EX1012, 1 (annotated).

275. Mr. Prairie's remaining arguments about the reasonable expectation of success merely regurgitate arguments made in relation to the SenwaTec and Yoon or Carrier combination. As discussed above, a POSA would have been motivated to combine SenwaTec and Yoon or Carrier with a reasonable expectation of success. *Supra* Section IX.C.

C. Dependent Claims 2-16, 18-20, 22, and 24-38.

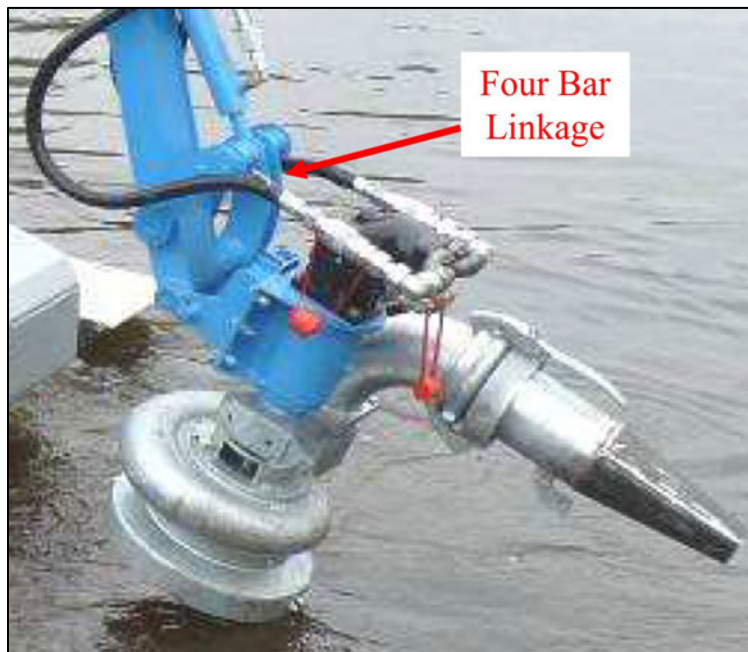
276. Claims 2, 4-6, 8-15, 18, 22, and 24-33 and 35-38 each depend from one of claims 1, 17, 21, or 23. Neither Nuhn nor Mr. Prairie provide any analysis or opinion regarding these claims and obviousness over SenwaTec, Yoon or Carrier,

and Manure-Manager, aside from referring back to previous claims from which they depend. EX2099, ¶¶452-457.

277. As discussed in my prior declaration, it is my opinion that these claims are obvious over SenwaTec in view of Yoon or Carrier. EX1004, Section XIII.

278. As for claim 16, SenwaTec renders this claim obvious for the reasons discussed above. *Supra* Section IX.E.

279. Claims 3, 7, 19-20, 23, and 34 are obvious for the reasons outlined above. *Supra* Section XII.C. Furthermore, SenwaTec already teaches a four bar linkage for adjusting the position of the pump nozzle. A POSA would have been motivated to retain this structure in order to retain this nozzle adjustability functionality.



EX1012, 1 (annotated).

XIV. GROUND 8: CLAIMS 1-38 ARE RENDERED OBVIOUS BY THE COMBINATION OF PUCK AND BRYHAM, (ALONE OR IN VIEW OF BENNETT-II), AND MANURE-MANAGER

280. Claims 1-38 of the '708 Patent are rendered obvious by the combination of Puck and Bryham in view of Manure-Manager. The combination of Puck and Bryham renders obvious claims 17-18, 23-26, and 35-38 for the reasons discussed above. *Supra* Section X. The addition of Manure-Manager renders obvious claims 1-16, 19-22, and 27-34. EX1004, Section XII. A POSA would have been motivated to add Manure-Manager to take advantage of the efficiency and durability capabilities described by Manure-Manager and other publications. *Supra* Section XII.A.

281. Nuhn and Mr. Prairie do not provide any arguments as to why one would not have been motivated to combine Manure-Manager with the vehicle of Puck and Bryham. Rather, Nuhn simply regurgitates the arguments made in connection with Puck, Bryham, and Bennett-II in connection with Grounds 4 and 5. As explained above, these arguments are wrong. *Supra* Sections X-XI.

282. Dependent claims 2, 4-6, 8-15, 18, 22, and 24-33 and 35-38 each depend from one of claims 1, 17, 21, or 23. Neither Nuhn nor Mr. Prairie provide any analysis or opinion regarding these claims and obviousness over Puck, Bryham, and Manure-Manager, aside from referring back to previous claims from which they depend. EX2099, ¶¶512-514. As discussed in my prior declaration, it is my opinion

that these claims are obvious over Puck, Bryham, and Manure-Manager. EX1004, Section XIV.

283. As for dependent claim 16, while Nuhn and Mr. Prairie do not dispute that the center of gravity of the Puck vehicle is located along the longitudinal centerline, Nuhn and Mr. Prairie allege that the Puck vehicle's center of gravity is not located substantially in a middle of the vehicle in the fore-and-aft direction of the vehicle. Claim 16 says nothing about the center of gravity being located substantially in a middle of the vehicle in the *fore-and-aft direction*. Regardless, Puck discloses that the engine is located substantially in a middle of the vehicle in the fore-and-aft direction. Puck's pump is located substantially in the middle of the vehicle in the fore-and-aft direction. Puck further discloses that the remainder of the components on the vehicle, including the vehicle body appear to be generally symmetrically arranged along the vehicle in the fore-aft direction. This arrangement of components provides a center of gravity that is generally located substantially in a middle of the vehicle in the fore-and-aft direction. For the purposes of stability on both land and water, a POSA would have understood that a vehicle such as Puck would be designed to have the center of gravity located substantially in a middle of the vehicle in the fore-and-aft direction. Therefore, even if Claim 16 were to require the center of gravity to be located substantially in a middle of the vehicle in the fore-

and-aft direction, it is my opinion that claim 16 is obvious over Puck in view of Bryham.

284. Claims 3, 7, 19-20, 23, and 34 are obvious for the reasons outlined above. *Supra* Section XII.C.

XV. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

A. The Challenged Claims Lack Nexus to Nuhn's Secondary Considerations.

285. Despite arguing that Nuhn's Lagoon Crawlers' commercial embodiments are commensurate in scope with the claims of the '708 Patent, neither Nuhn nor Mr. Prairie provide any analysis or evidence that any of the Lagoon Crawler models are coextensive in scope with all claims of the '708 Patent. Rather, Mr. Prairie's analysis is limited to independent claims 1, 17, 21, and 23. EX2099, 268-416.

286. It is my opinion that the claims of the '708 Patent are not coextensive in scope with Nuhn's Lagoon Crawler products. I understand that a patentee is entitled to a rebuttable presumption of nexus between the asserted evidence of secondary considerations and a patent claim if the patentee shows that the asserted evidence is tied to a specific product and that the product is the invention disclosed and claimed. Thus, I understand that presuming nexus is appropriate when the patentee shows that the asserted objective evidence is tied to a specific product and

that product both embodies the claimed features and is coextensive with them. On the other hand, I understand that when the specific product is not coextensive with the patented invention, the patentee is not entitled to a presumption of nexus.

287. I understand that a patent claim is not coextensive with a product that includes a critical unclaimed feature that is claimed by a different patent and that materially impacts the product's functionality.

288. I understand that U.S. Patent Nos. 9,694,636, 10,124,638, 10,974,557, 11,358,425, 11,491,835, and the '708 Patent are all related continuation patents. I understand that each of these patents recite additional features that are present in the Lagoon Crawler but are not present in the claims of the '708 Patent.

289. I also understand that Nuhn has filed for a motion to amend its patent claims in the IPR related to the '835 Patent. I understand that in connection with its motion to amend in the '835 Patent, Nuhn argued that:

The prior art does not teach or suggest the claimed arrangements where *[1]* the liquid manure pump is positioned along the underside of the floatable vehicle body, *[2]* is immersed in the liquid manure when the vehicle is floating, *[3]* has a substantially vertically oriented drive shaft, and/or *[4]* is located in the space between the four ground engaging wheels, or *[5]* where the nozzle is located above the floatable vehicle body to spray manure back into a manure lagoon and/or *[6]* is forward of the power source while the liquid manure pump is rearward of the power source, as required by the Substitute Claims. [EX2094, ¶368].

These differences between the prior art and the claimed arrangements of components are material. The particular claimed arrangements of components directly contribute to the new and unexpected results and

commercial success experienced by Nuhn's invention. EX2094, ¶369. These particular claimed arrangements, which discussion [sic] the position of the liquid manure pump along the underside of the floatable vehicle body and rearward of the power source and the position of the nozzle above the floatable vehicle body and forward of the power source provide a vehicle where the displacement of the vehicle body, the churning action of the ground engaging elements work, and the arial spray of manure from the nozzle work together in synergy to break up thick crust around the vehicle, generating a working pocket or opening within which the liquid manure pump can operate without clogging. *Id.* ***Placing these elements elsewhere would destroy this synergy, which depends on the specific location of the liquid manure pump and/or nozzle as claimed.***

IPR2024-00004, Paper 21 at 19-20 (emphasis added).

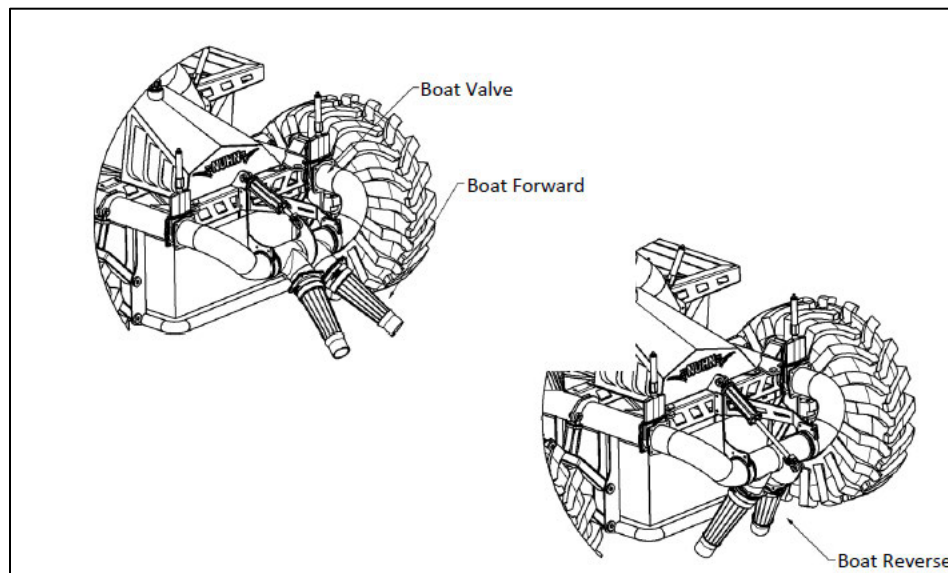
290. It is my opinion that, in light of Nuhn's statements, these features recited in Nuhn's amended claims are not insignificant. Therefore, because the '708 Patent does not claim features that Nuhn describes as "material" or essential to the synergy of the alleged invention, the '708 Patent claims are not coextensive with the Lagoon Crawler products.

291. As explained below, each of these additional features are embodied in Nuhn's Lagoon Crawler products. Based on Nuhn's statements to the Patent Office, it is reasonably likely that Nuhn's secondary considerations evidence is attributable to these additional features, as opposed to the features described in the '708 Patent claims.

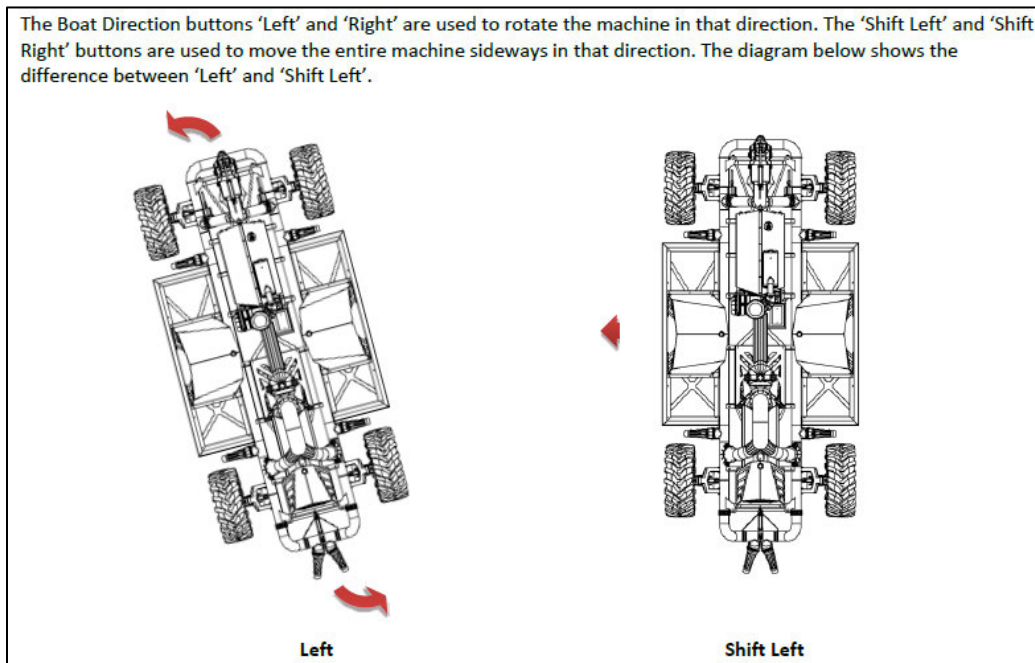
i. Nuhn's Gen 1 Lagoon Crawler (MY2014-MY2017)

A valve structure in the fluid conduit, the plurality of fluid nozzles and the valve structure co-operating to provide directional control and motive power for the vehicle when floating ('638 Patent, claim 1; '638 Patent, claim 10)

292. The Operator's/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler illustrates a boat valve structure and plurality of fluid nozzles that control the speed and direction of the Lagoon Crawler in the manure lagoon.



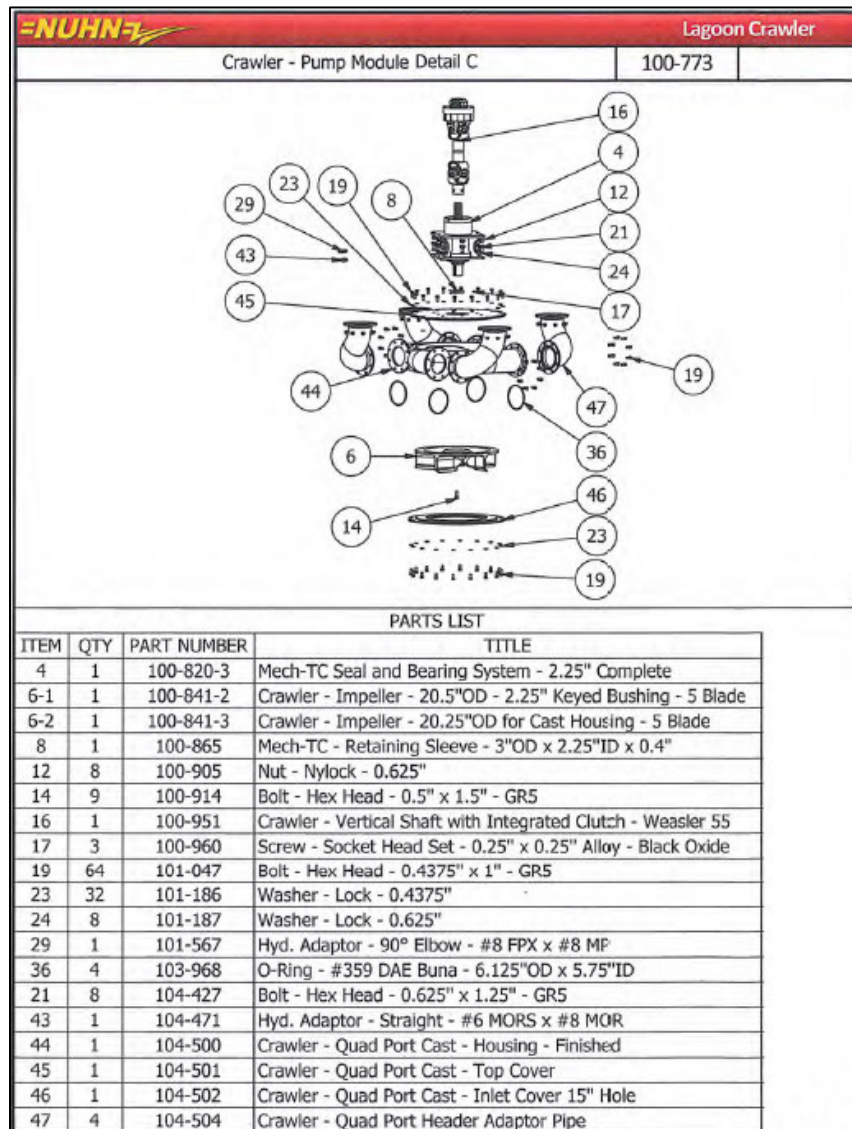
EX2036, 14.



EX2036, 15.

The immersible liquid manure pump of the liquid manure mover including a housing and an impeller that are positioned along the underside of the floatable vehicle body ('835 Patent, substitute claim 57 and 79)

293. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows a pump with an impeller and housing.



EX2037, 54.

294. A brochure for the Gen 1 Lagoon Crawler describes that the “pump is located on the bottom of the Crawler...” EX2038, 2.

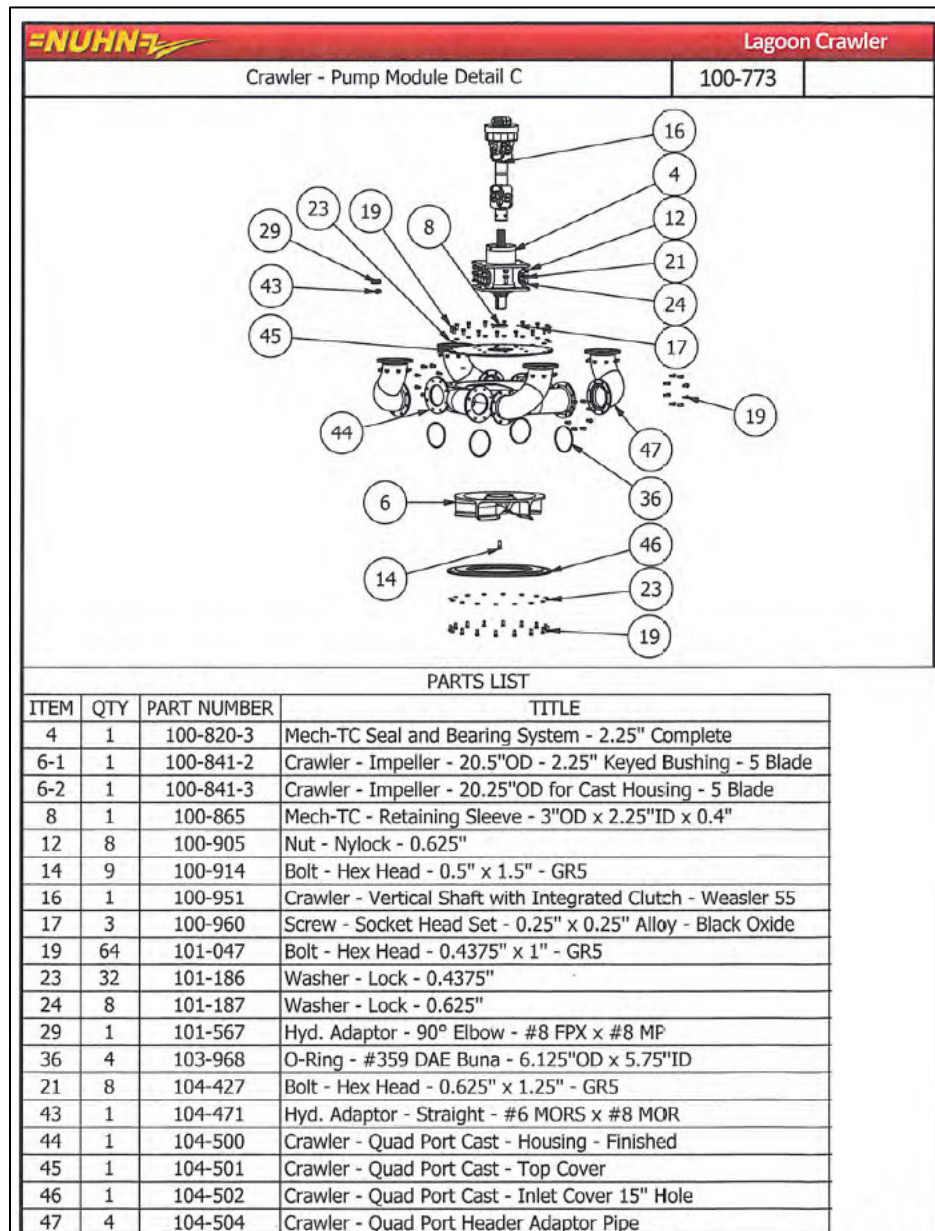
The immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating ('835 Patent, substitute claim 41, 57, 79, 80)

295. The Operator's/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler describes that it includes a pump that is "[s]pecifically designed for harsh lagoon environment" with a "[p]ump [that] is submerged in lagoon so it will not lose its prime[.]" EX2036, 6.

296. A brochure for the Gen 1 Lagoon Crawler describes that the "header pump... is submerged at all times...." EX2038, 2.

The immersible liquid manure pump of the liquid manure mover including a substantially vertical drive shaft powering an impeller ('835 Patent, substitute claim 41, 79, 80)

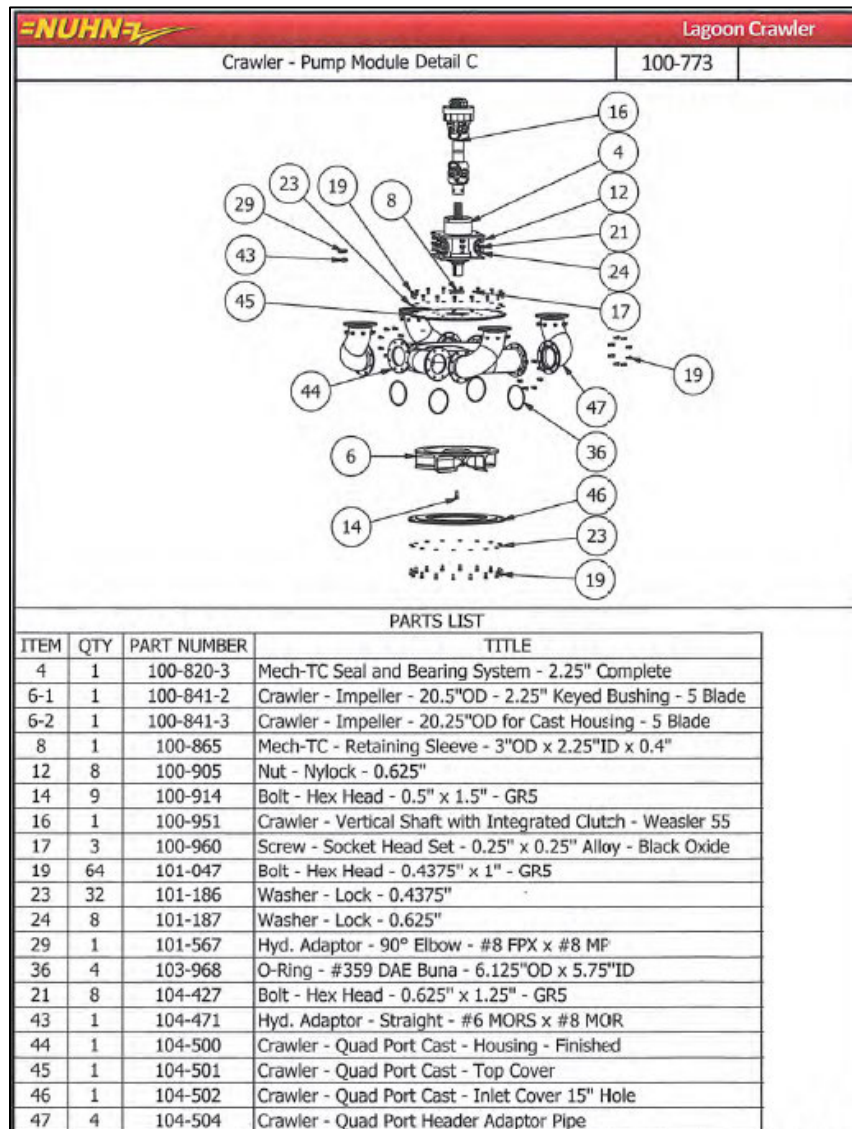
297. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows a "[v]ertical [s]haft" that is connected to an impeller.



EX2037, 54.

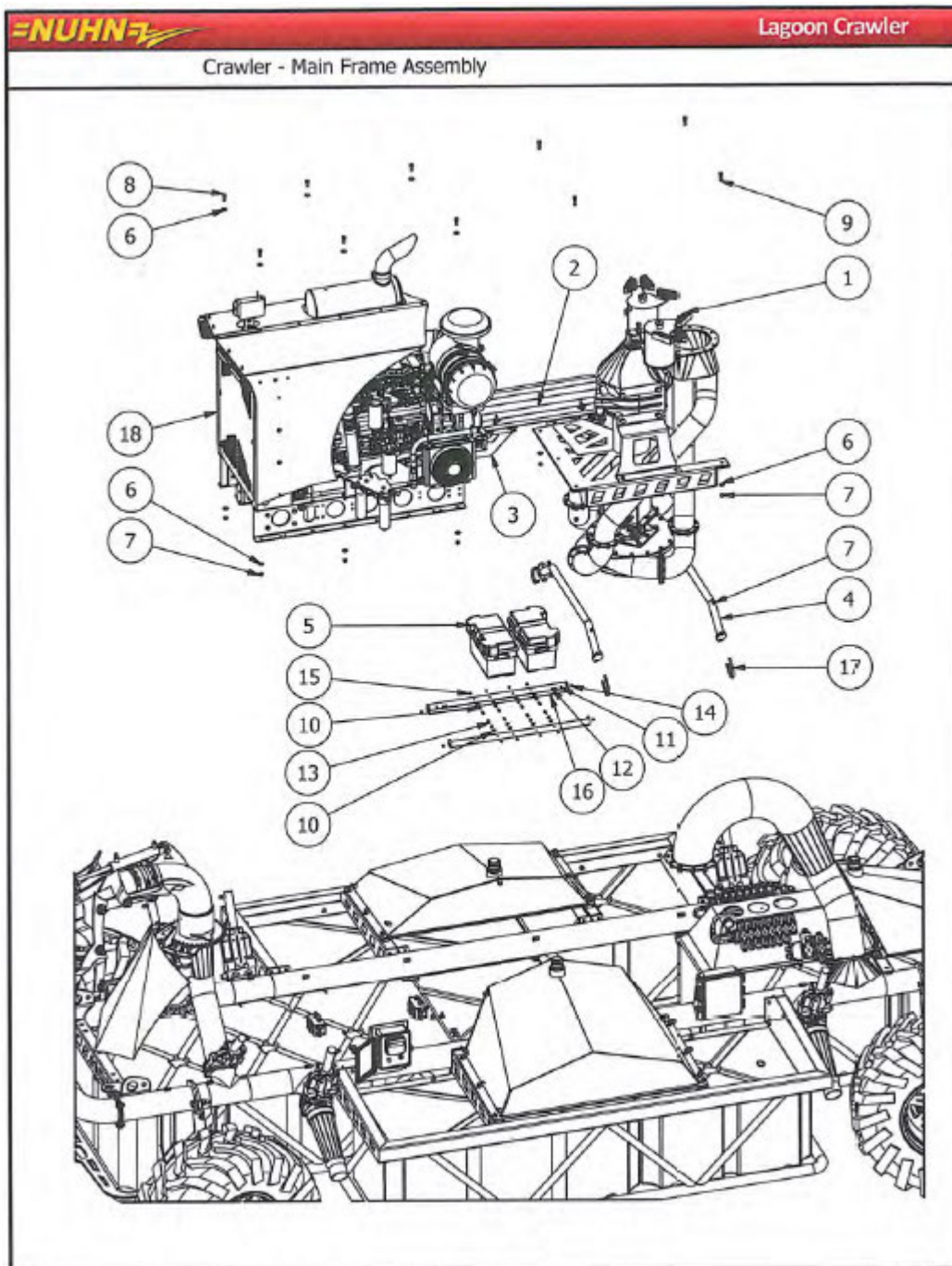
The immersible liquid manure pump of the liquid manure mover including a housing and the impeller in a space between the four ground engaging wheels ('835 Patent, substitute claim 79)

298. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows a pump with an impeller and housing.



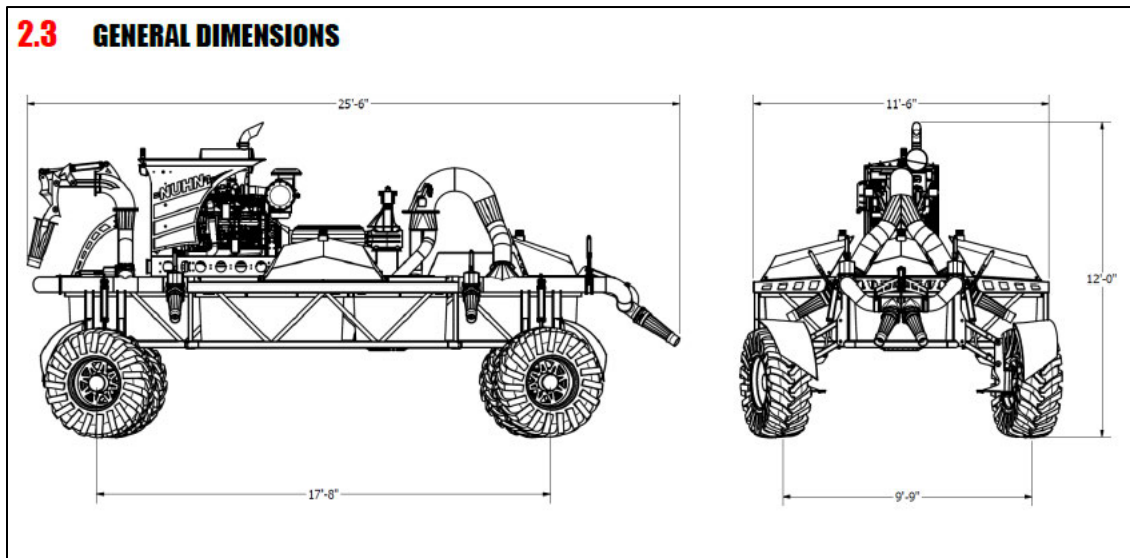
Id.

299. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows the pump module in an exploded view demonstrating its placement in a space between the four wheels.



Id., 39.

300. The Operator's/Safety Manual for the MY2017 Gen 1 Lagoon Crawler illustrates the pump positioned in the space between the four ground engaging wheels.



EX2036, 5.

The at least one fluid nozzle positioned above the floatable vehicle body to direct a flow of liquid manure from the liquid manure mover through the air and back into the manure lagoon ('835 Patent, substitute claim 57)

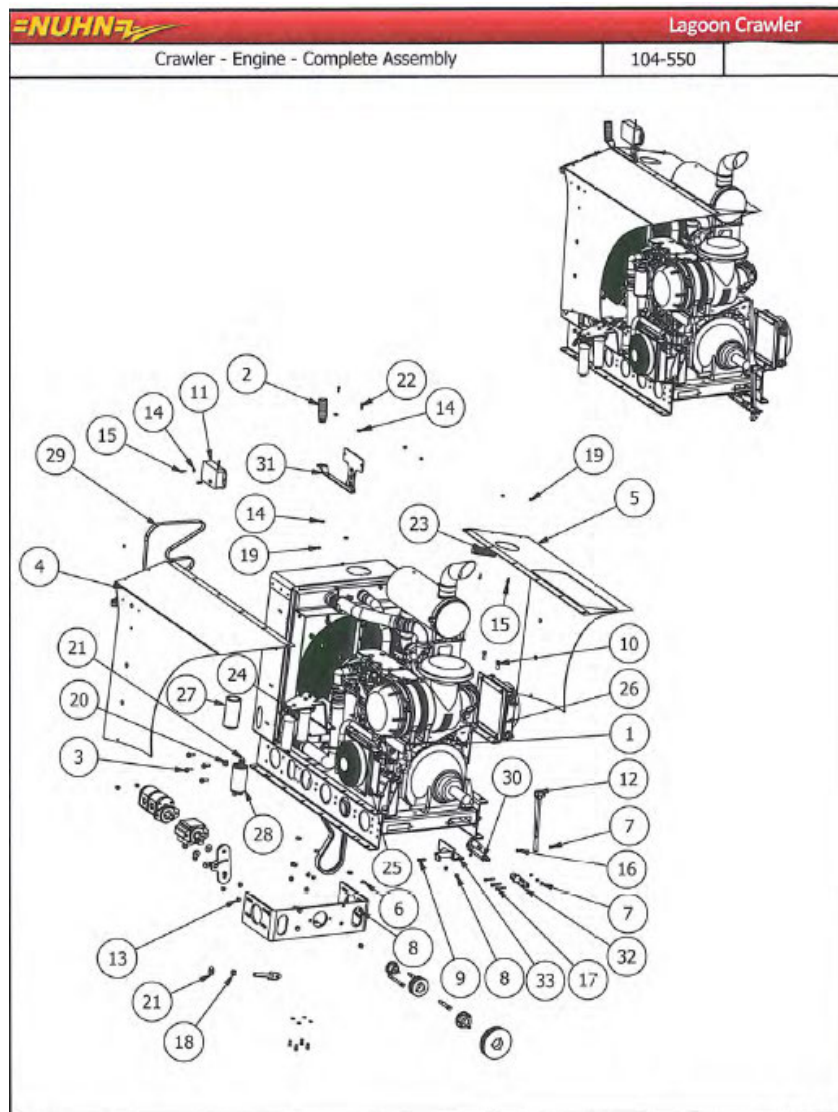
301. A brochure for the Gen 1 Lagoon Crawler illustrates a stream of manure propelled from a nozzle positioned above the floatable vehicle body.



EX2038, 1.

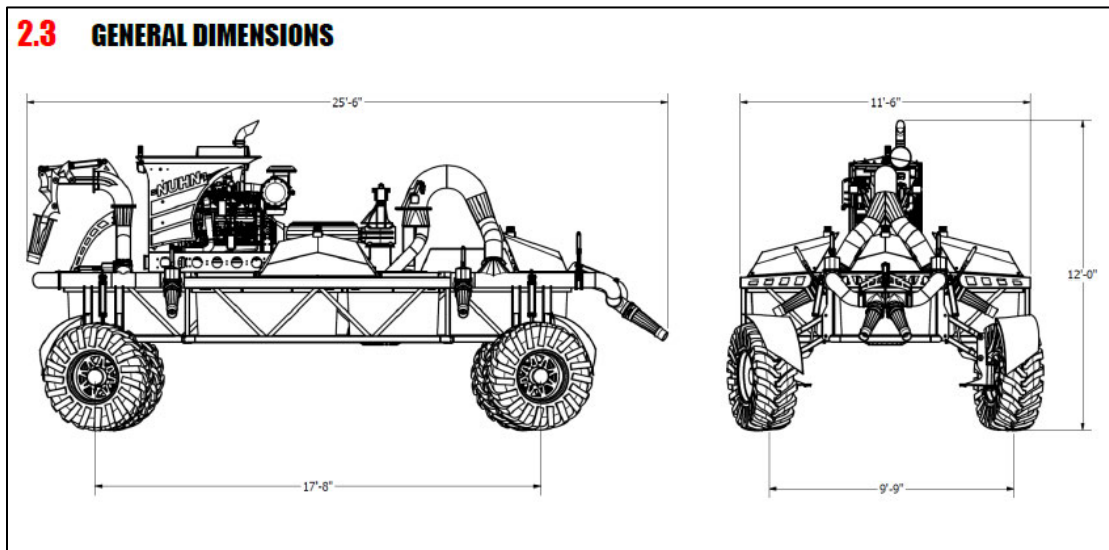
The at least one fluid nozzle is forward of the power source while the liquid manure pump is rearward of the power source ('835 Patent, substitute claim 41, 80)

302. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows vehicle engine serving as the power source.



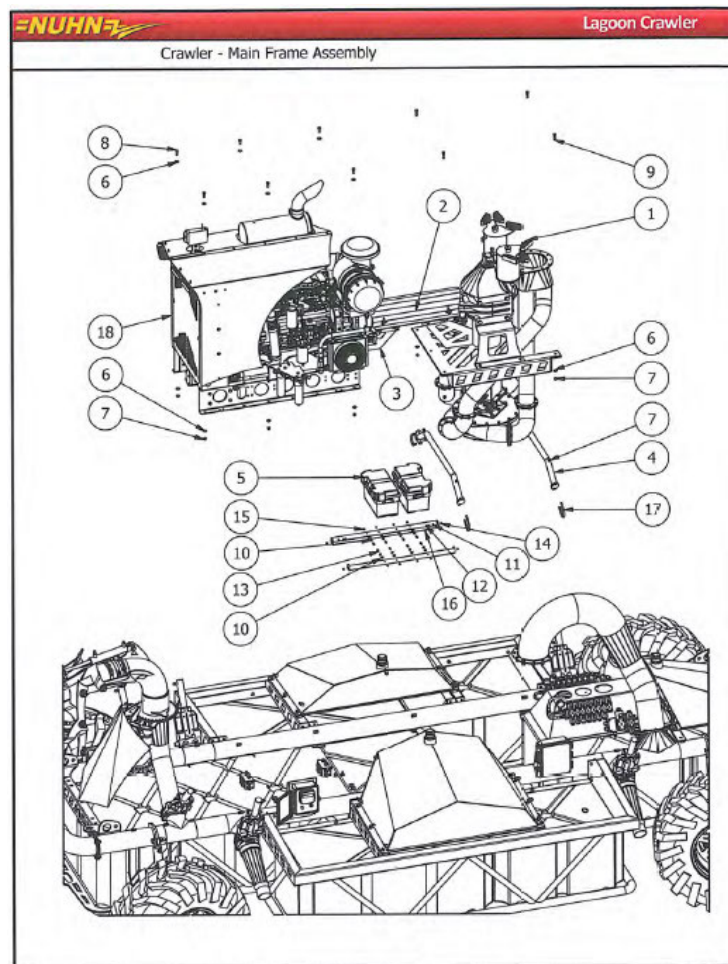
EX2037, 41.

303. The Operator's/Safety Manual for the MY2017 Gen 1 Lagoon Crawler illustrates nozzles on either side of the engine, and a nozzle that is forward of the engine.



EX2036, 5.

304. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows the pump module positioned rearward of the engine.

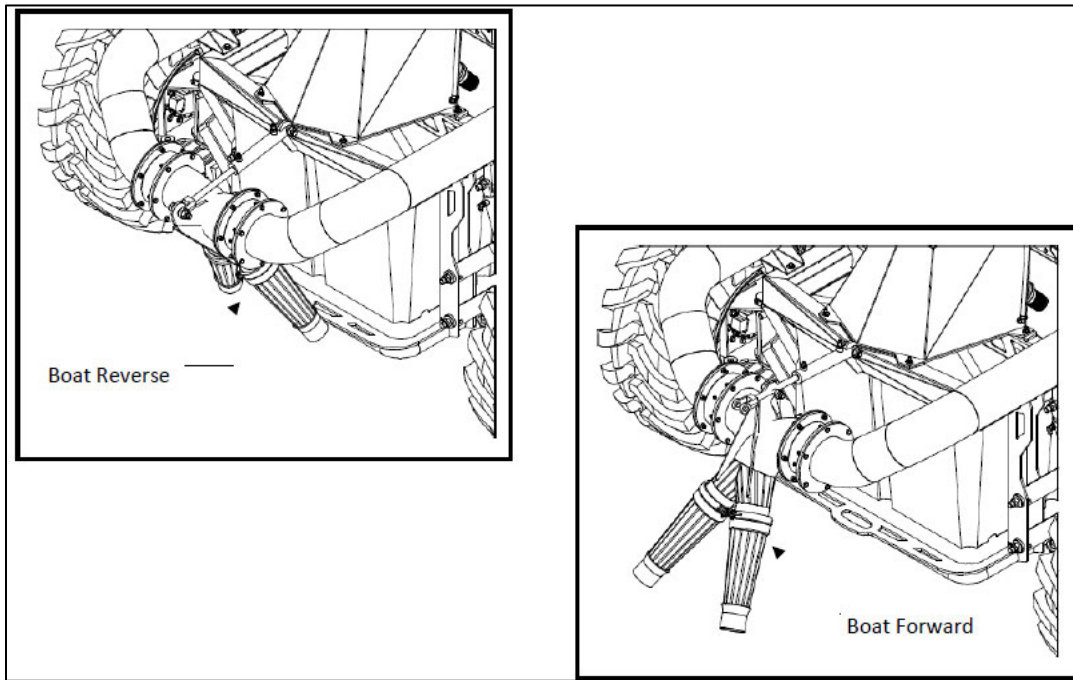


EX2037, 39.

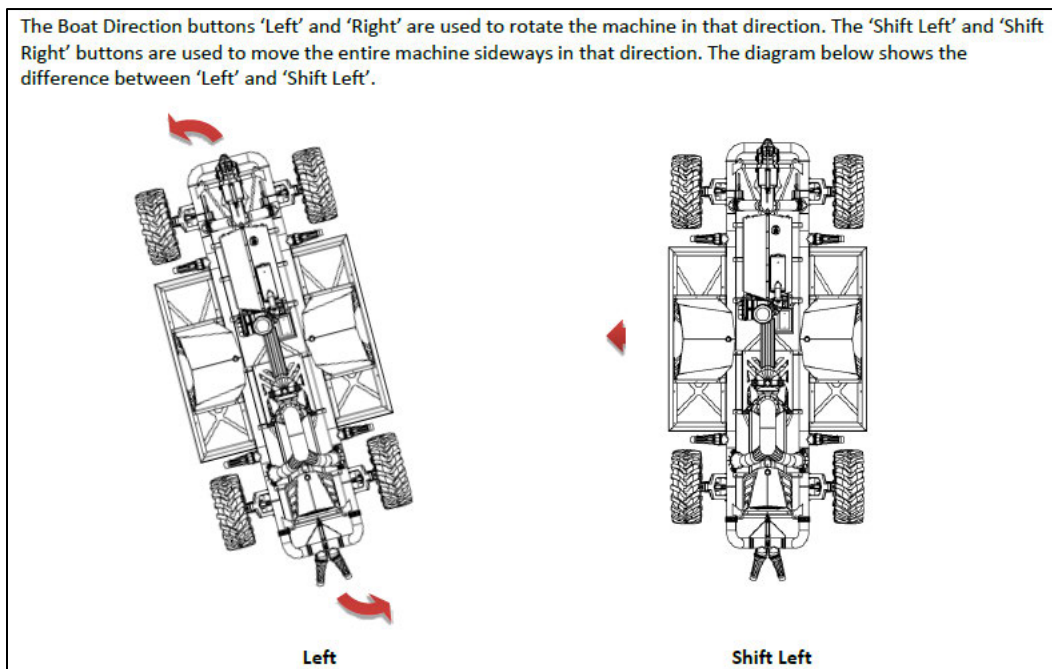
ii. Nuhn's Gen 2 Lagoon Crawler (My2018)

A valve structure in the fluid conduit, the plurality of fluid nozzles and the valve structure co-operating to provide directional control and motive power for the vehicle when floating ('638 Patent, claim 1; '638 Patent, claim 10)

305. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler illustrates the vehicle comprising a boat valve structure and plurality of fluid nozzles that control the speed and direction of the Lagoon Crawler in the manure lagoon.



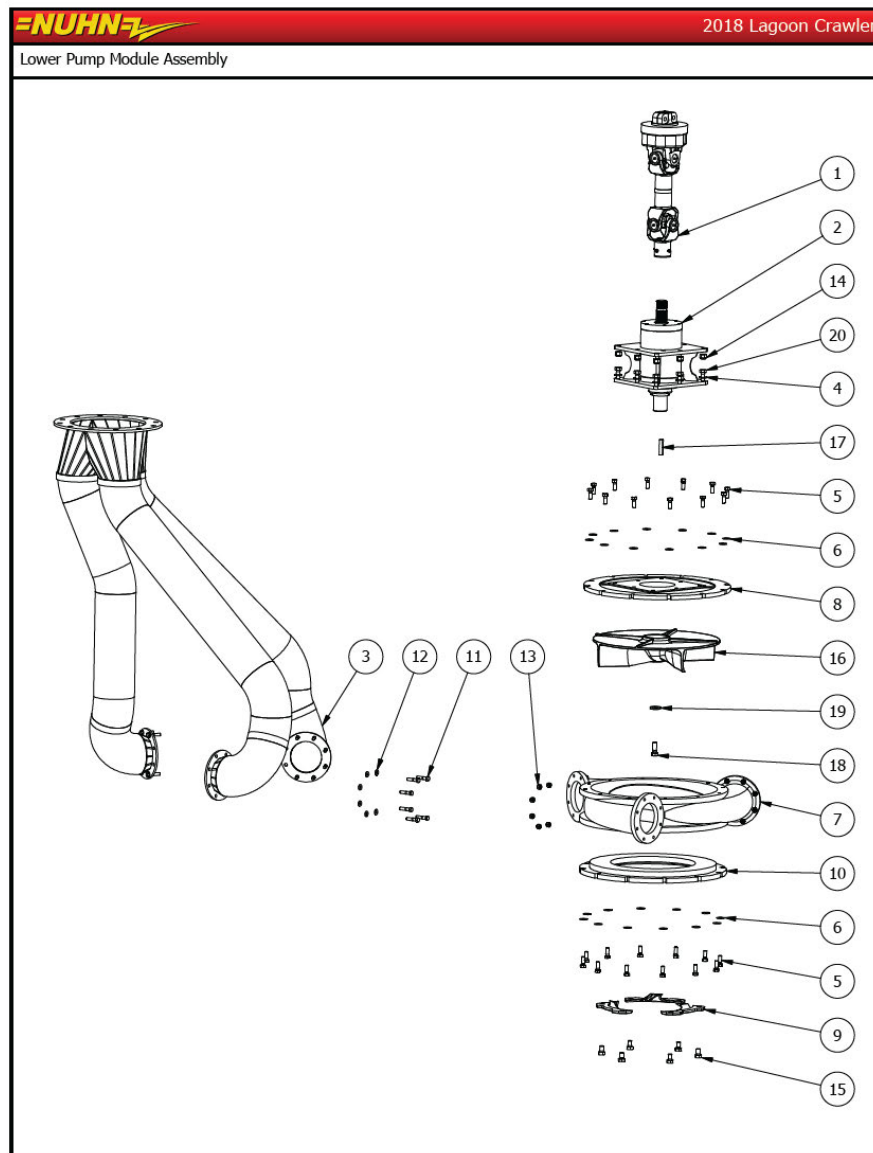
EX2040, 14.



Id., 15.

The immersible liquid manure pump of the liquid manure mover including a housing and an impeller that are positioned along the underside of the floatable vehicle body ('835 Patent, substitute claim 57 and 79)

306. The parts catalog for the MY2018 Gen 2 Lagoon Crawler shows a pump comprising an impeller and housing.

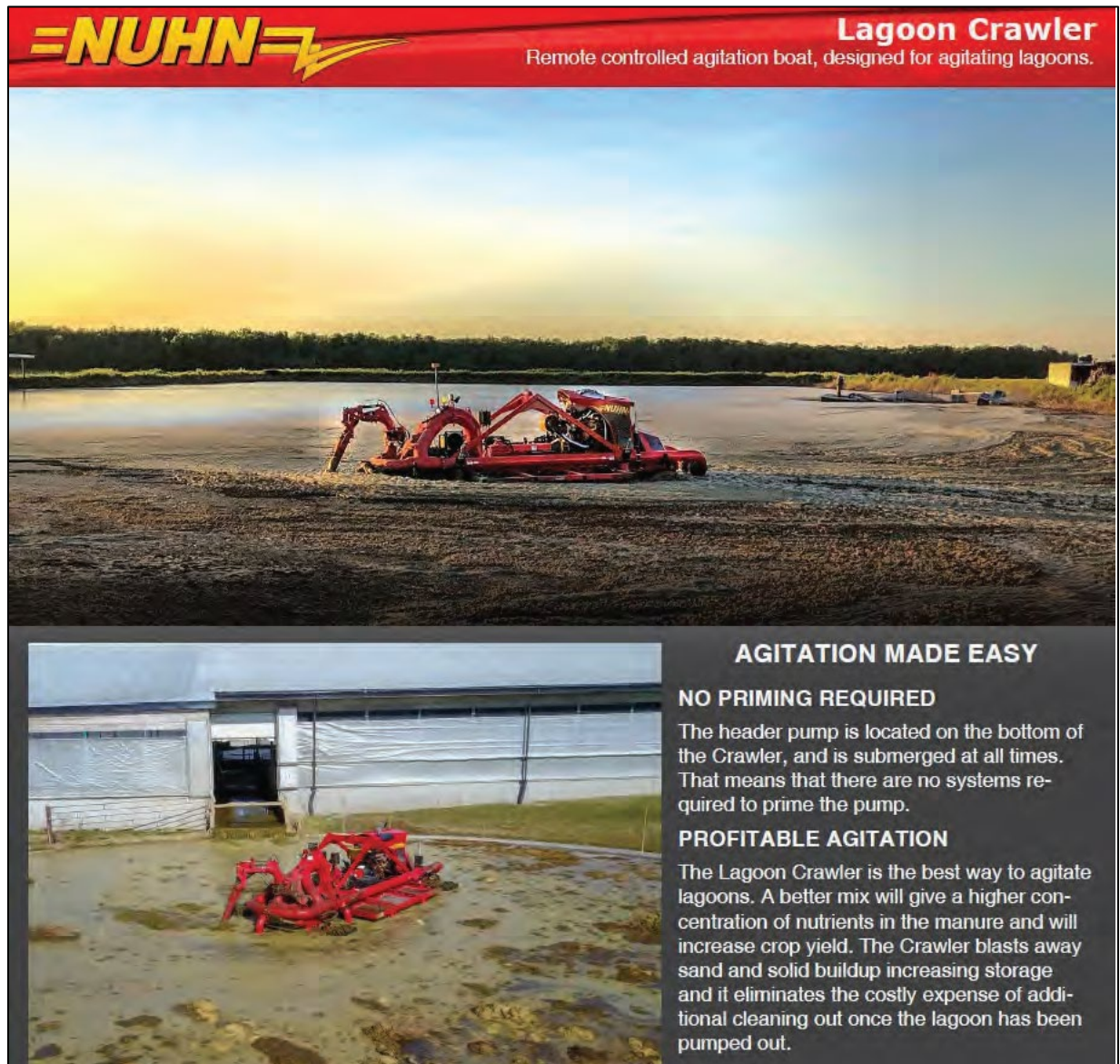


EX2041, 36.

=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

Id., 37.

307. A brochure for the Gen 2 Lagoon Crawler describes that “[t]he header pump is located on the bottom of the Crawler....” EX2042, 1.



Id.

The immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating ('835 Patent, substitute claim 41, 57, 79, 80)

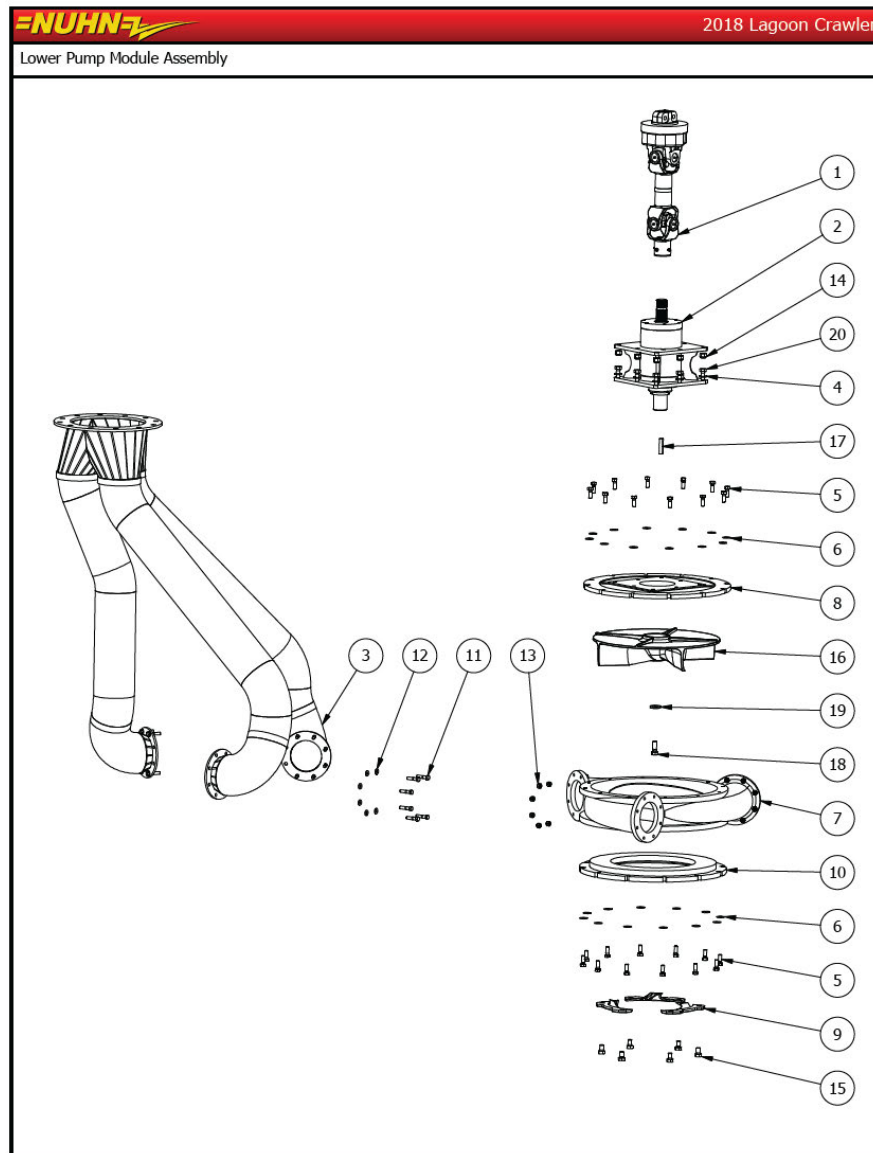
308. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler describes that it includes a pump that is "[s]pecifically designed for harsh

lagoon environment” with a “[p]ump [that] is submerged in lagoon so it will not lose its prime[.]” EX2040, 6.

309. A brochure for the Gen 2 Lagoon Crawler describes that the “header pump... is submerged at all times....” EX2042, 1.

The immersible liquid manure pump of the liquid manure mover including a substantially vertical drive shaft powering an impeller ('835 Patent, substitute claim 41, 79, 80)

310. The parts catalog for the MY2018 Gen 2 Lagoon Crawler shows a pump comprising a “[v]ertical [s]haft” connected to an impeller.



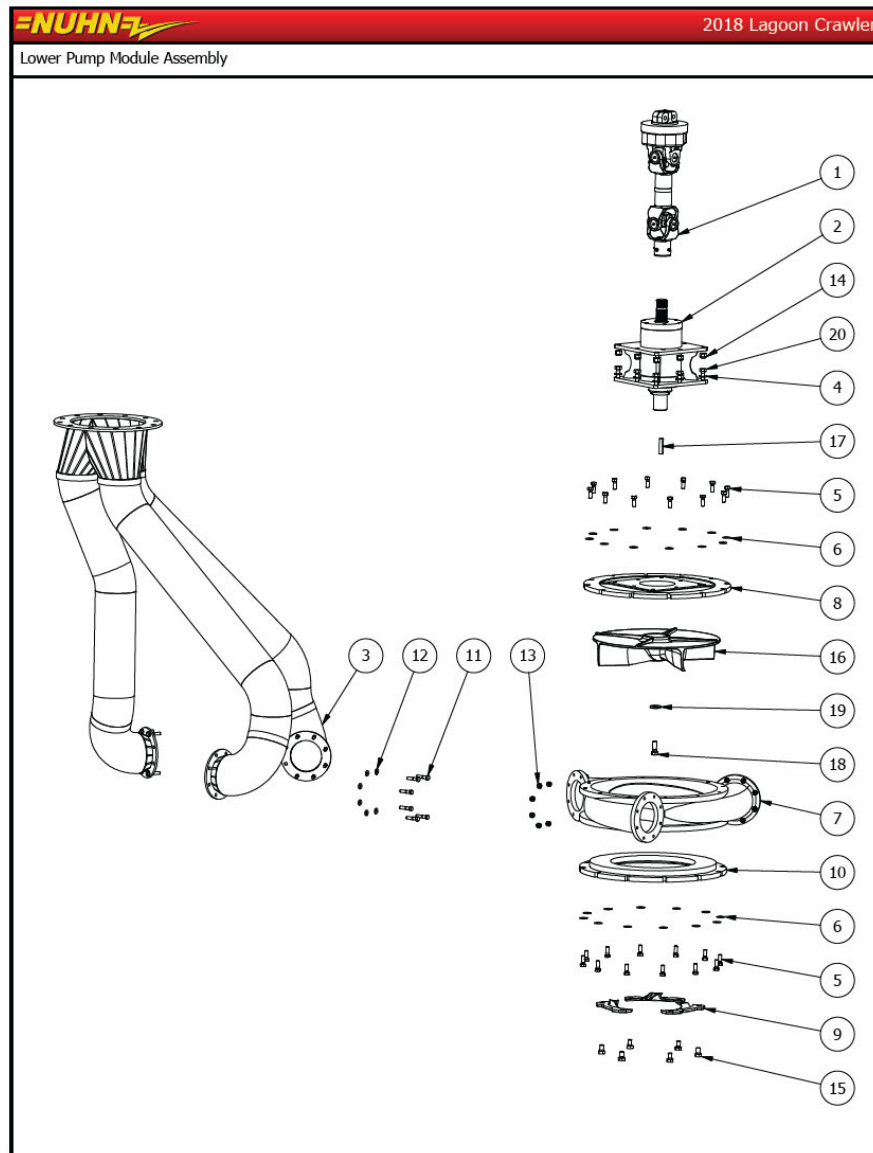
EX2041, 36.

=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

Id., 37.

The immersible liquid manure pump of the liquid manure mover including a housing and the impeller located in a space between the four ground engaging wheels ('835 Patent, substitute claim 79)

311. The parts catalog for the MY2018 Gen 2 Lagoon Crawler shows a pump comprising an impeller and housing.

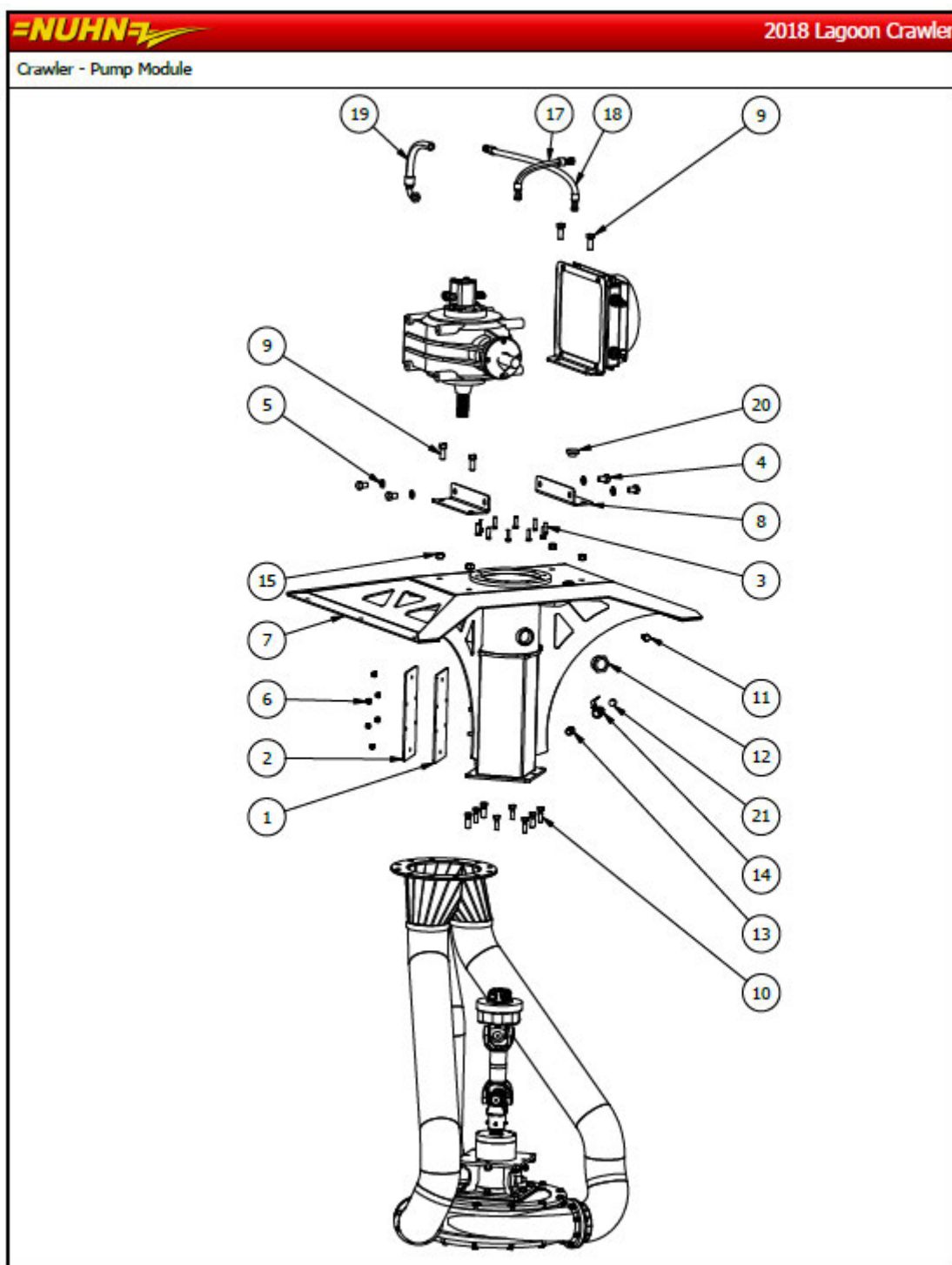


Id., 36.

=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

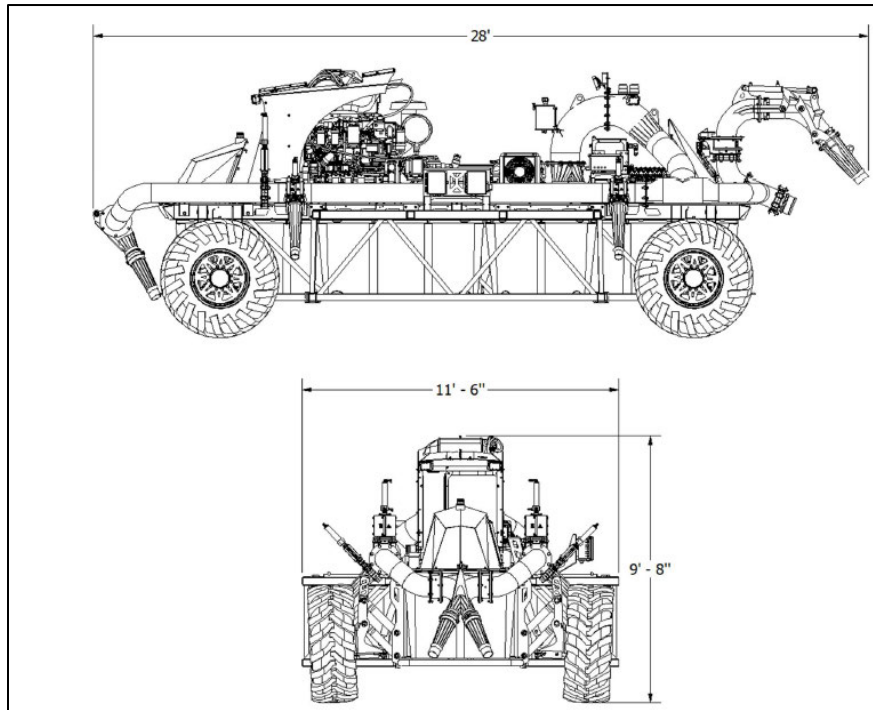
Id., 37.

312. The parts catalog for the MY2018 Gen 2 Lagoon Crawler shows the pump module positioned below the gearbox cooler.



Id., 31.

313. The Operator's/Safety Manual for the MY2019 Gen 2 Lagoon Crawler illustrates the gearbox cooler, which is directly above the fluid pump, located in a space between the four tires.



EX2040, 5.

The at least one fluid nozzle positioned above the floatable vehicle body to direct a flow of liquid manure from the liquid manure mover through the air and back into the manure lagoon ('835 Patent, substitute claim 57)

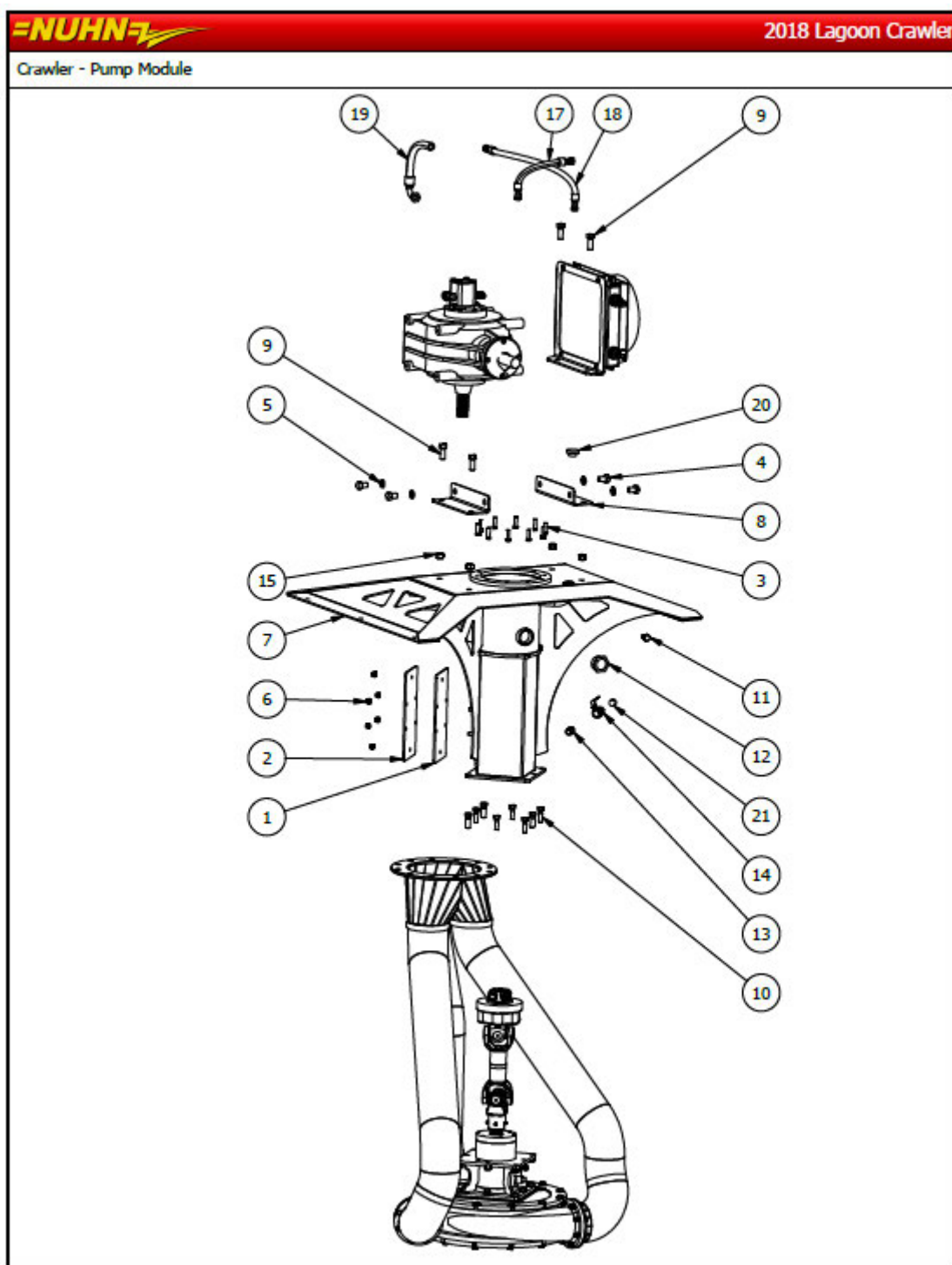
314. A brochure for the Gen 2 Lagoon Crawler illustrates a stream of manure propelled from a nozzle positioned above the floatable vehicle body.



EX2039, 2.

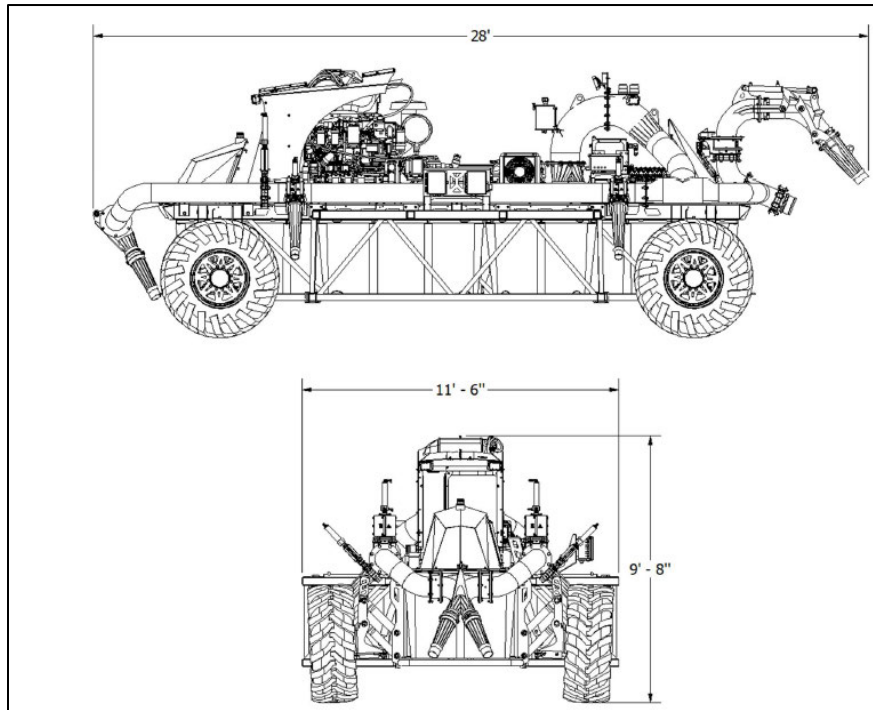
The at least one fluid nozzle is forward of the power source while the liquid manure pump is rearward of the power source ('835 Patent, substitute claim 41, 80)

315. The parts catalog for the MY2018 Gen 2 Lagoon Crawler shows the pump module positioned below the gearbox cooler.



EX2041, 31.

316. The Operator's/Safety Manual for the MY2019 Gen 2 Lagoon Crawler illustrates the gearbox cooler, which is directly above the fluid pump, located in a rearward of the engine, and a nozzle that is forward of the engine.



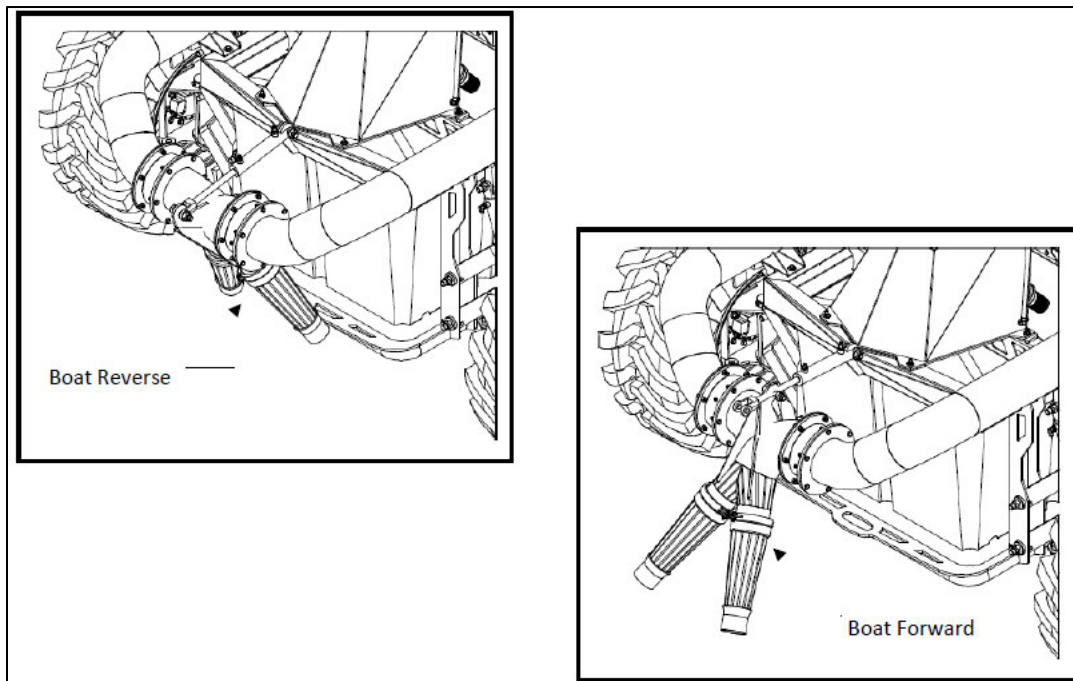
EX2040, 5.

iii. Nuhn's Gen 3 Lagoon Crawler (My2020-My2022)

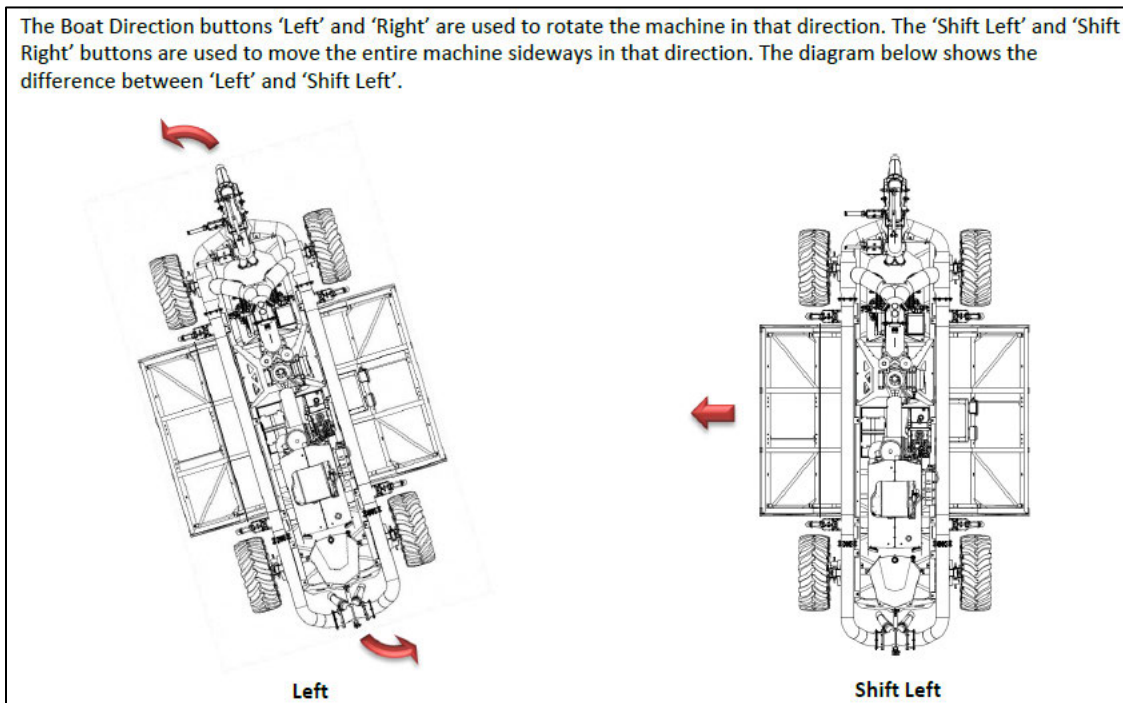
A valve structure in the fluid conduit, the plurality of fluid nozzles and the valve structure co-operating to provide directional control and motive power for the vehicle when floating ('638 Patent, claim 1; '638 Patent, claim 10)

317. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes opening and closing the rear valves for the purpose of moving forwards and backwards. EX2044, 9.

318. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes controlling the speed and direction of the Lagoon Crawler in the manure lagoon with fluid nozzles.



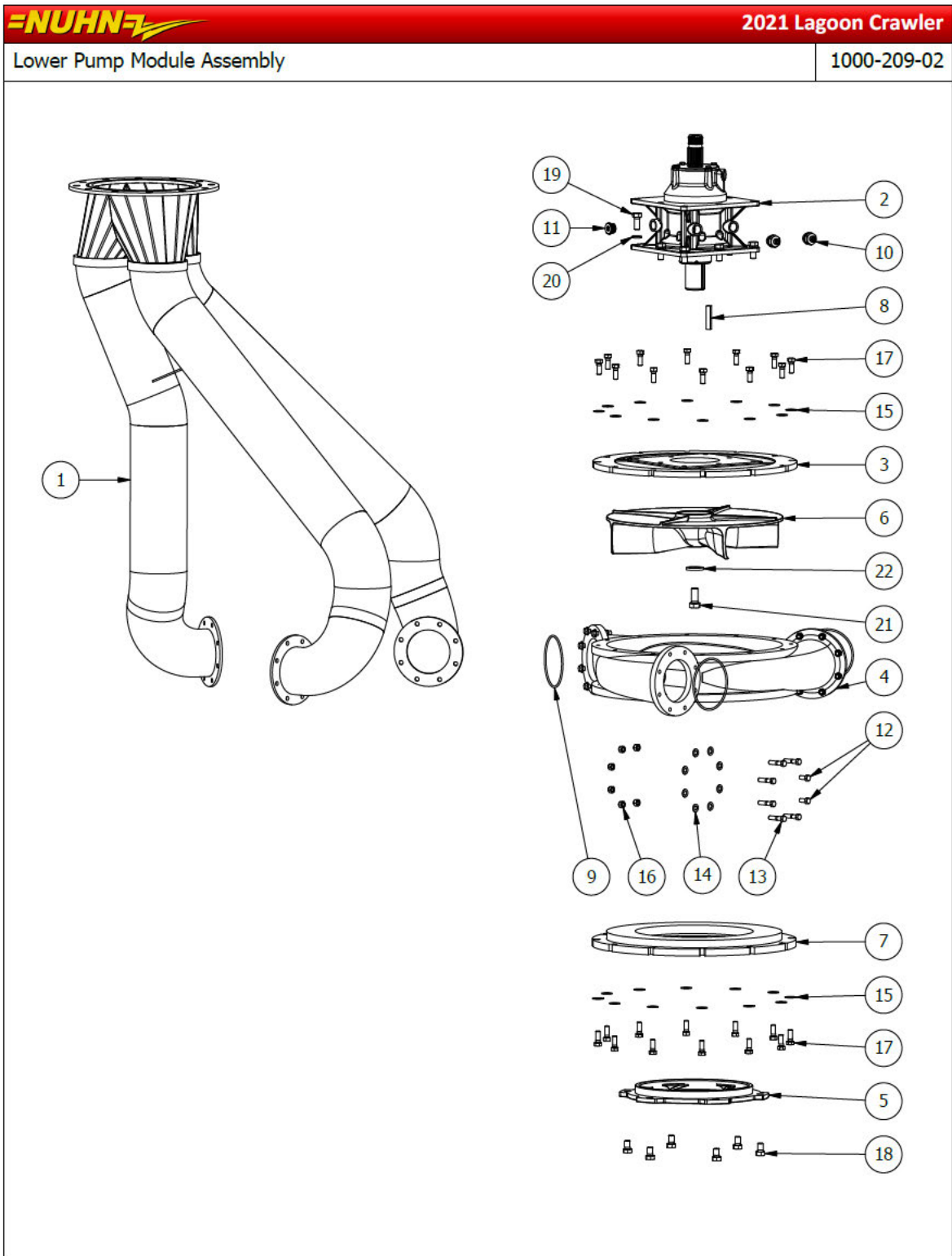
Id., 28.



Id., 29.

The immersible liquid manure pump of the liquid manure mover including a housing and an impeller that are positioned along the underside of the floatable vehicle body ('835 Patent, substitute claim 57 and 79)

319. The parts catalog for the MY2021 Gen 3 Lagoon Crawler shows a pump comprising an impeller and housing.



EX2045, 36.

Id., 37.

320. A brochure for the Gen 3 Lagoon Crawler describes that “[t]he header pump is located on the bottom of the Crawler....” EX2043, 1.



LAGOON CRAWLER

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.

4' GROUND CLEARANCE
The wheels drop down giving the vehicle roughly 4' of ground clearance. Controlled by remote.

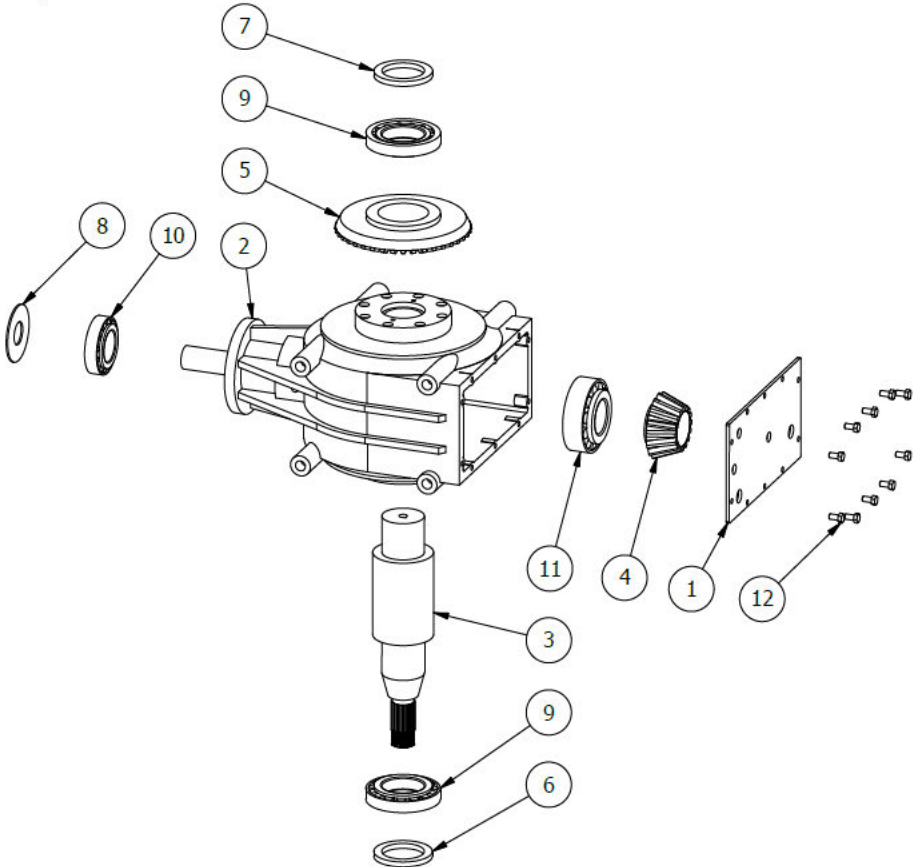
Id.

The immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating ('835 Patent, substitute claim 41, 57, 79, 80)

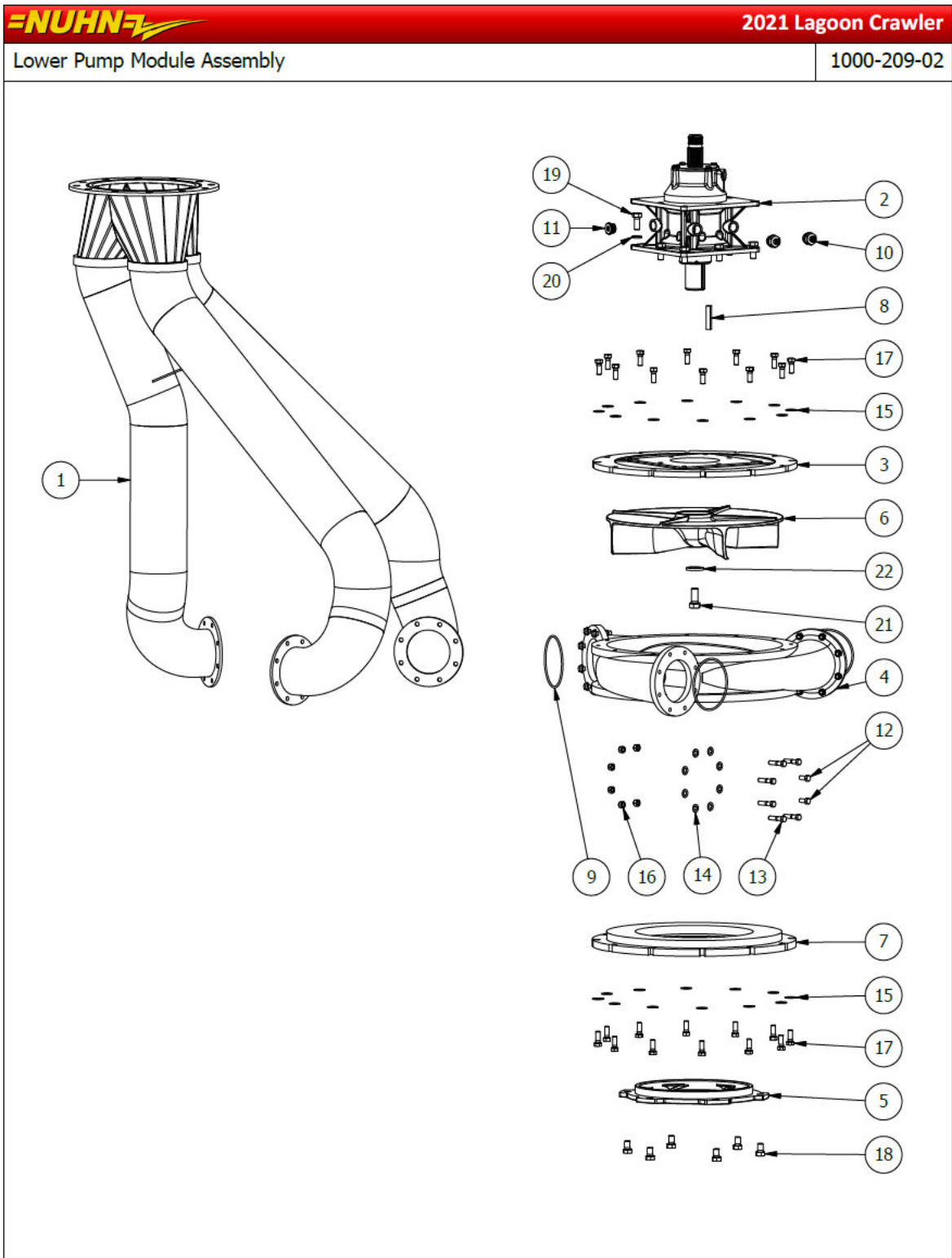
321. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes that it includes a pump that is "[s]pecifically designed for harsh lagoon environment" with a "[p]ump [that] is submerged in lagoon so it will not lose its prime[.]" EX2044, 6.

The immersible liquid manure pump of the liquid manure mover including a substantially vertical drive shaft powering an impeller ('835 Patent, substitute claim 41, 79, 80)

322. The parts catalog for the MY2021 Gen 3 Lagoon Crawler shows a vertically oriented shaft connected to an impeller.

=NUHN=			2021 Lagoon Crawler	
Crawler - Gear Box - T-332A - With Pump Pad			100-950-1	1000-209-02
Note: Uses 75/140 Synthetic Oil 8.5 Lts. 				
PARTS LIST				
ITEM	QTY	PART NUMBER	TITLE	
1	1	104-517-1	Gear Box T-332A - Cover	
2	1	104-515	Gear Box T-332A - Casing	
3	1	104-513-1	Gear Box T-332A - Shaft 1"	
4	1	104-512	Gear Box T-332A - Pinion Shaft	
5	1	104-514	Gear Box T-332A - Crown Wheel Z40 M7.75	
6	1	104-754-1	Gear Box T-332A - Double Lip Seal 80-110-10	
7	1	109-043	Gear Box T-332A - Lip Seal 70-90-10	
8	1	104-260	Gear Box #332 - Oil Seal, 50-110-12-TC	
9	2	104-509	Bearing - Tapered Roller - 30216	
10	1	104-511	Bearing - Tapered Roller - 32212	
11	1	104-510	Bearing - Tapered Roller - 32313	
12	10	104-516	Bolt - Hex Head - M10 x 20 - 8.8	

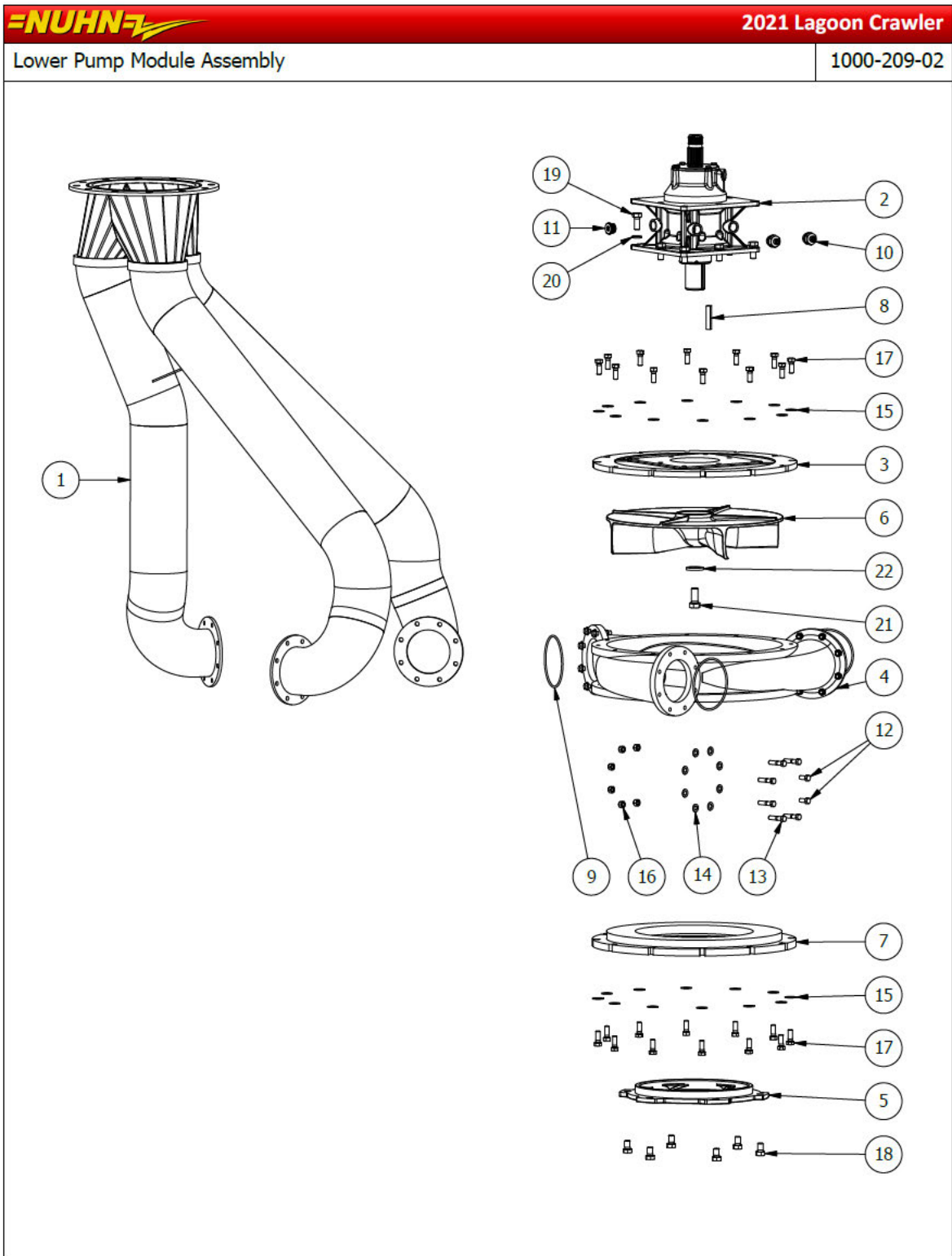
EX2045, 35.



Id., 36.

The immersible liquid manure pump of the liquid manure mover including a housing and the impeller located in a space between the four ground engaging wheels ('835 Patent, substitute claim 79)

323. The parts catalog for the MY2021 Gen 3 Lagoon Crawler shows a pump comprising an impeller and housing.



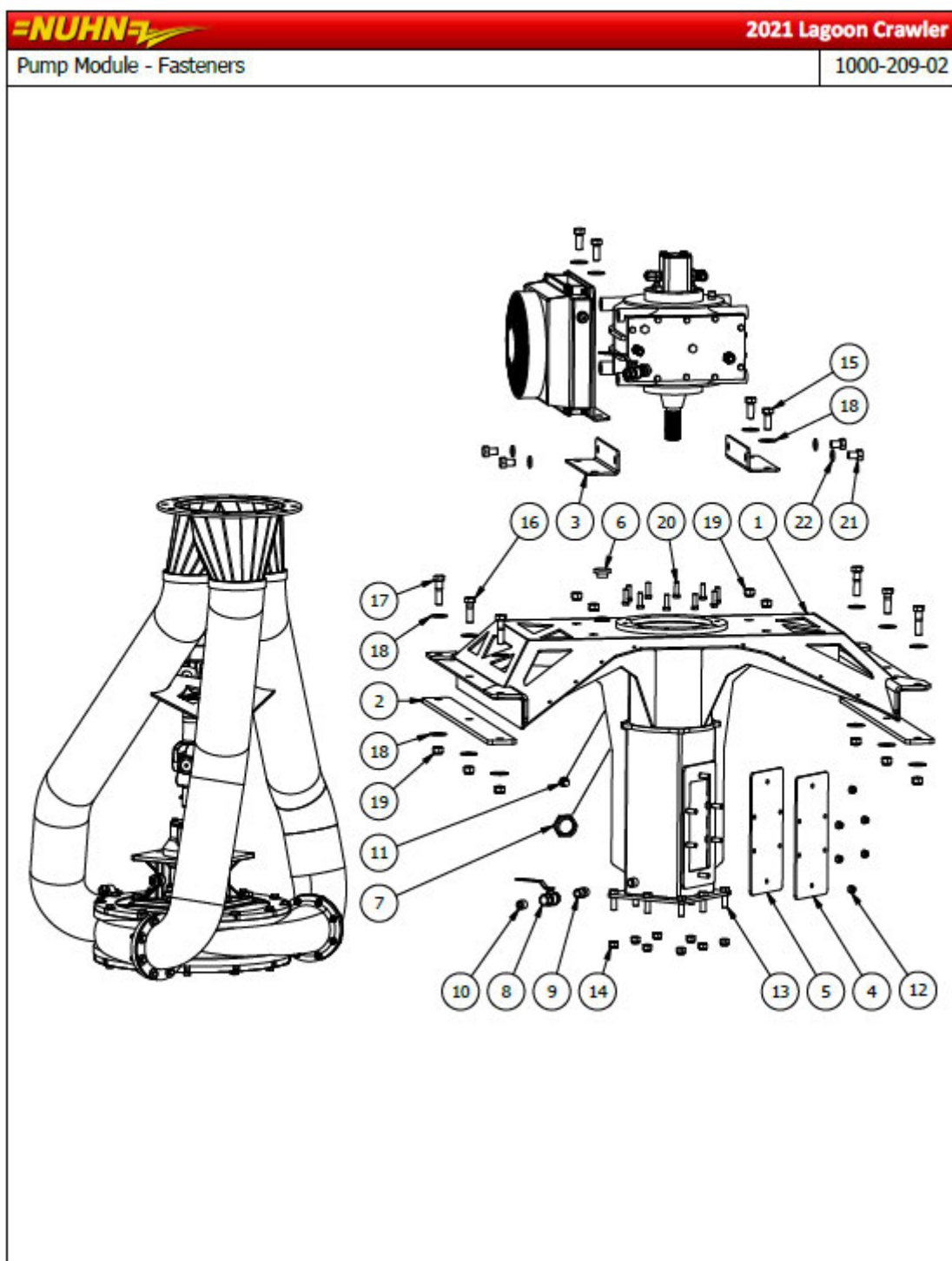
Id.

=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"

Id., 37.

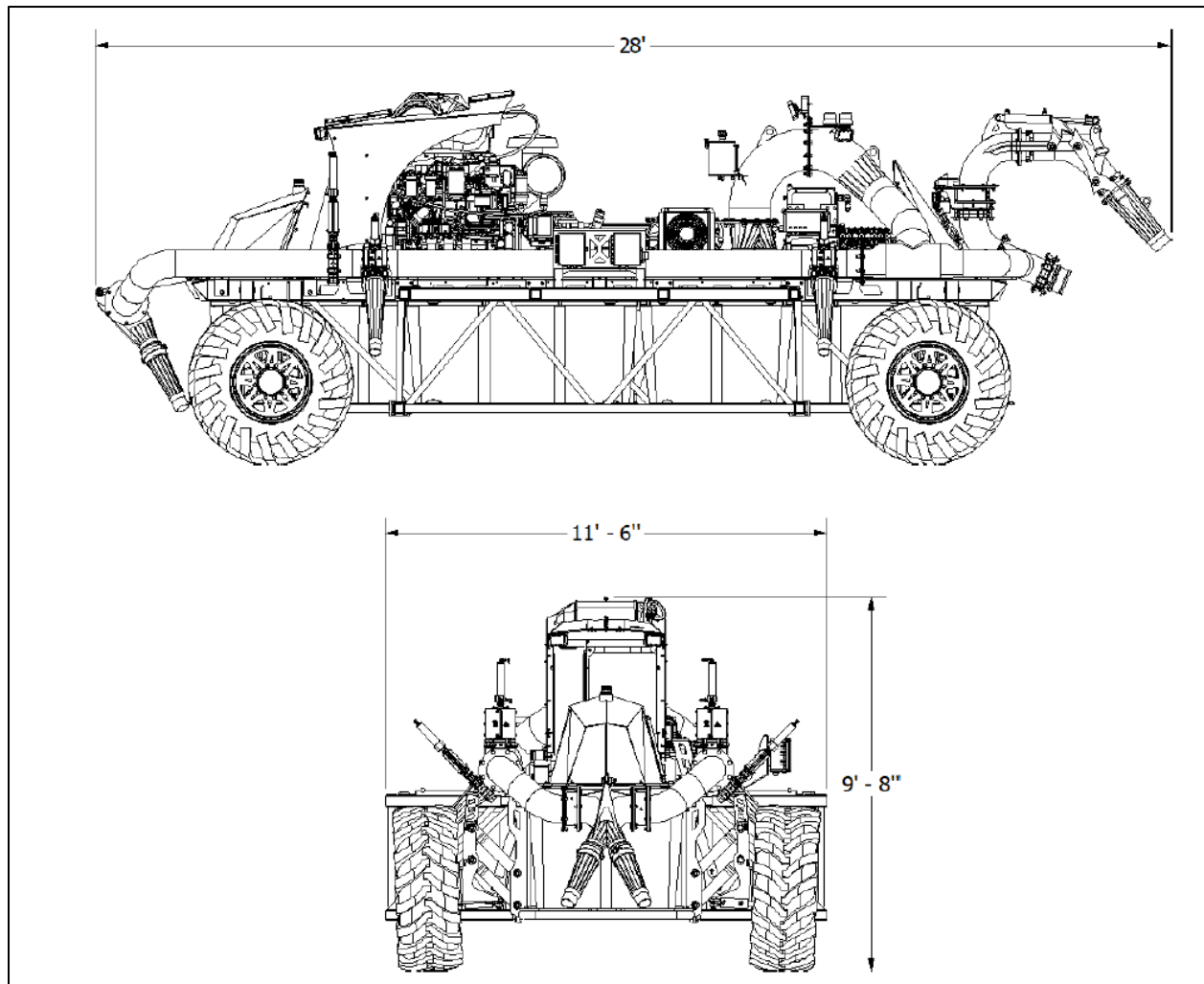
324. A brochure for the Gen 3 Lagoon Crawler states that the pump is “submerged at all times.” EX2043, 1.

325. The parts catalog for the MY2021 Gen 3 Lagoon Crawler shows a pump to be positioned below a gearbox cooler.



EX2045, 32.

326. The Operator's/Safety Manual for the MY2020 Gen 3 Lagoon Crawler shows a gearbox cooler, which is directly above the fluid pump, positioned in a space between the four tires.



EX2044, 5.

The at least one fluid nozzle positioned above the floatable vehicle body to direct a flow of liquid manure from the liquid manure mover through the air and back into the manure lagoon ('835 Patent, substitute claim 57)

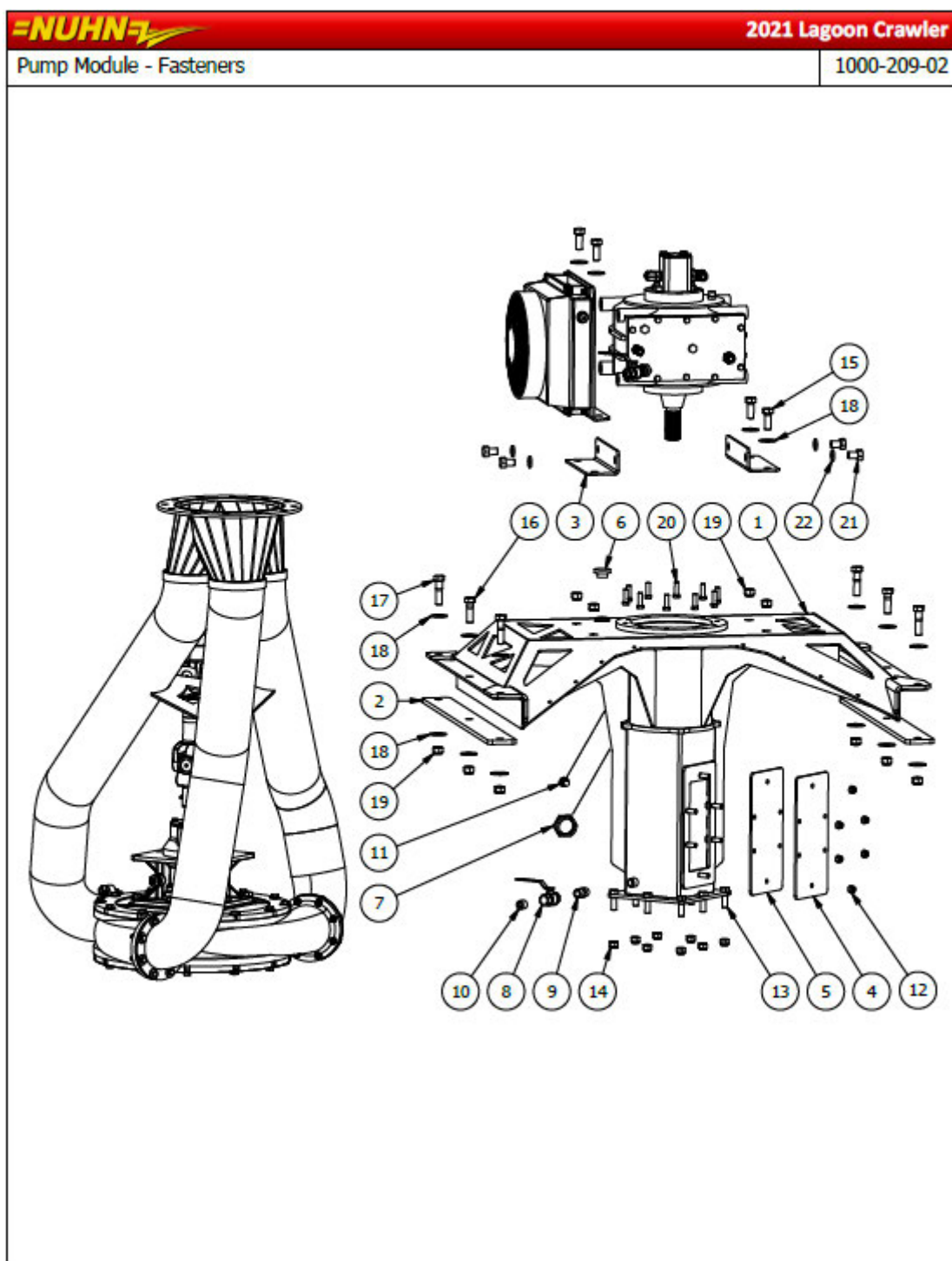
327. A brochure for the Gen 3 Lagoon Crawler illustrates a stream of manure propelled from a nozzle positioned above the floatable vehicle body.



EX2043, 2.

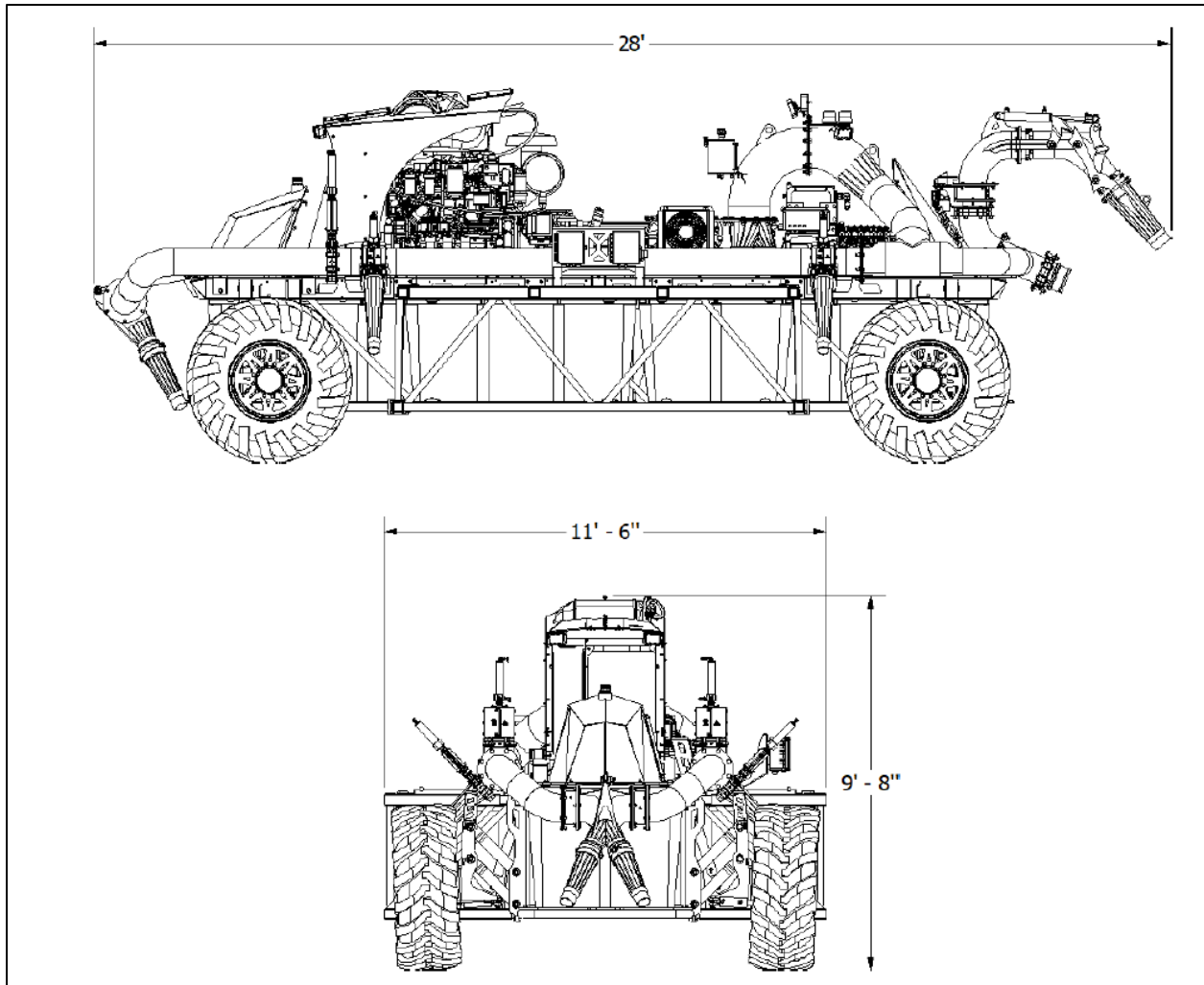
The at least one fluid nozzle is forward of the power source while the liquid manure pump is rearward of the power source ('835 Patent, substitute claim 41, 80)

328. The parts catalog for the MY2021 Gen 3 Lagoon Crawler shows a pump to be positioned below a gearbox cooler.



EX2045, 32.

329. The Operator's/Safety Manual for the MY2020 Gen 3 Lagoon Crawler shows a gearbox cooler, which is directly above the fluid pump, rearward of the engine, and a fluid nozzle forward of the engine.

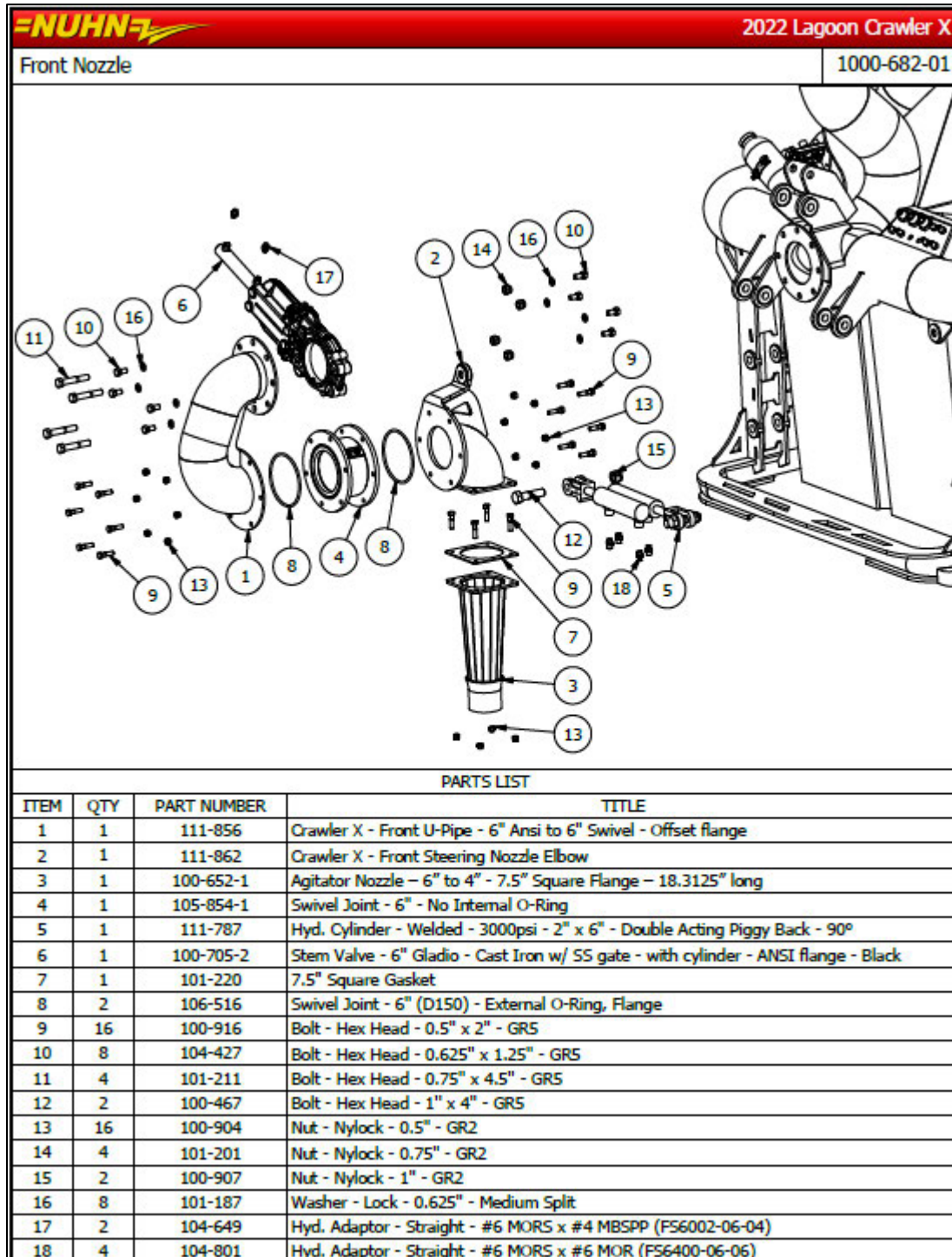


EX2044, 5.

iv. Nuhn's Crawler X

A valve structure in the fluid conduit, the plurality of fluid nozzles and the valve structure co-operating to provide directional control and motive power for the vehicle when floating ('638 Patent, claim 1; '638 Patent, claim 10)

330. The parts catalog for the 2022 Lagoon Crawler X illustrates a nozzle structure comprising a nozzle and stem valve.



EX2047, 19.

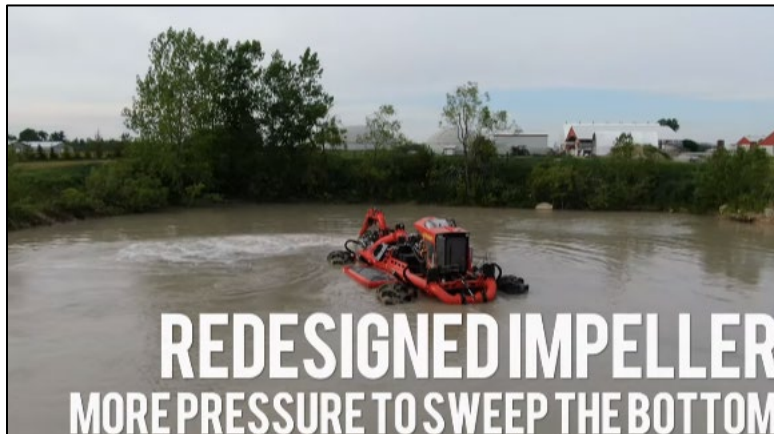
331. A brochure for the Lagoon Crawler X displays a fluid nozzle labeled as “steering.”



EX2046, 2.

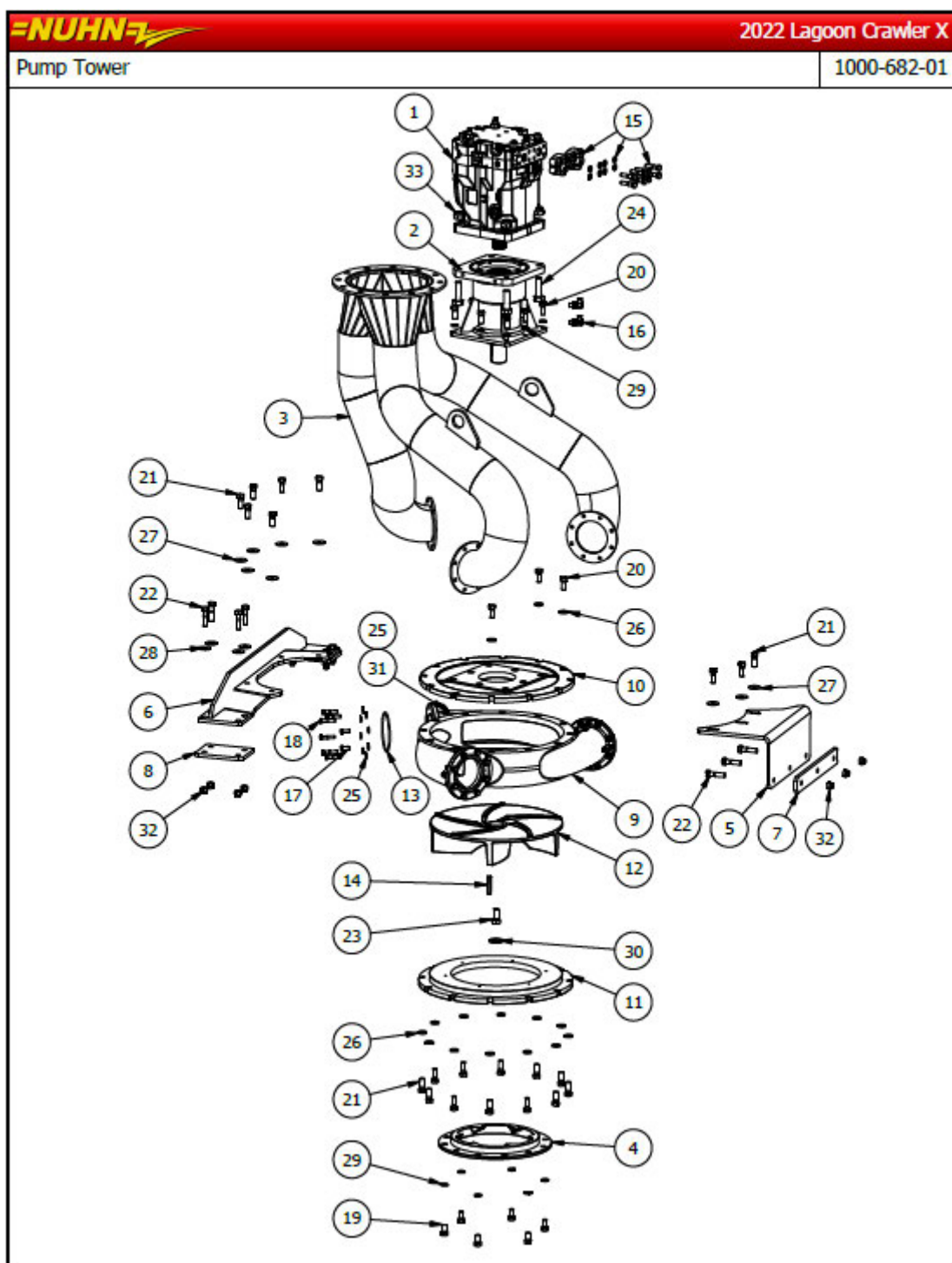
The immersible liquid manure pump of the liquid manure mover including a housing and an impeller that are positioned along the underside of the floatable vehicle body ('835 Patent, substitute claim 57 and 79)

332. A video of the Lagoon Crawler X shows an impeller positioned on the bottom of the vehicle so it can “sweep the bottom” of the lagoon.



EX1155, 3.

333. The parts catalog for the 2022 Lagoon Crawler X illustrates a pump tower having both a housing and impeller that is positioned along the underside of the vehicle.



EX2047, 36.

=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

Id., 37.

The immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating ('835 Patent, substitute claim 41, 57, 79, 80)

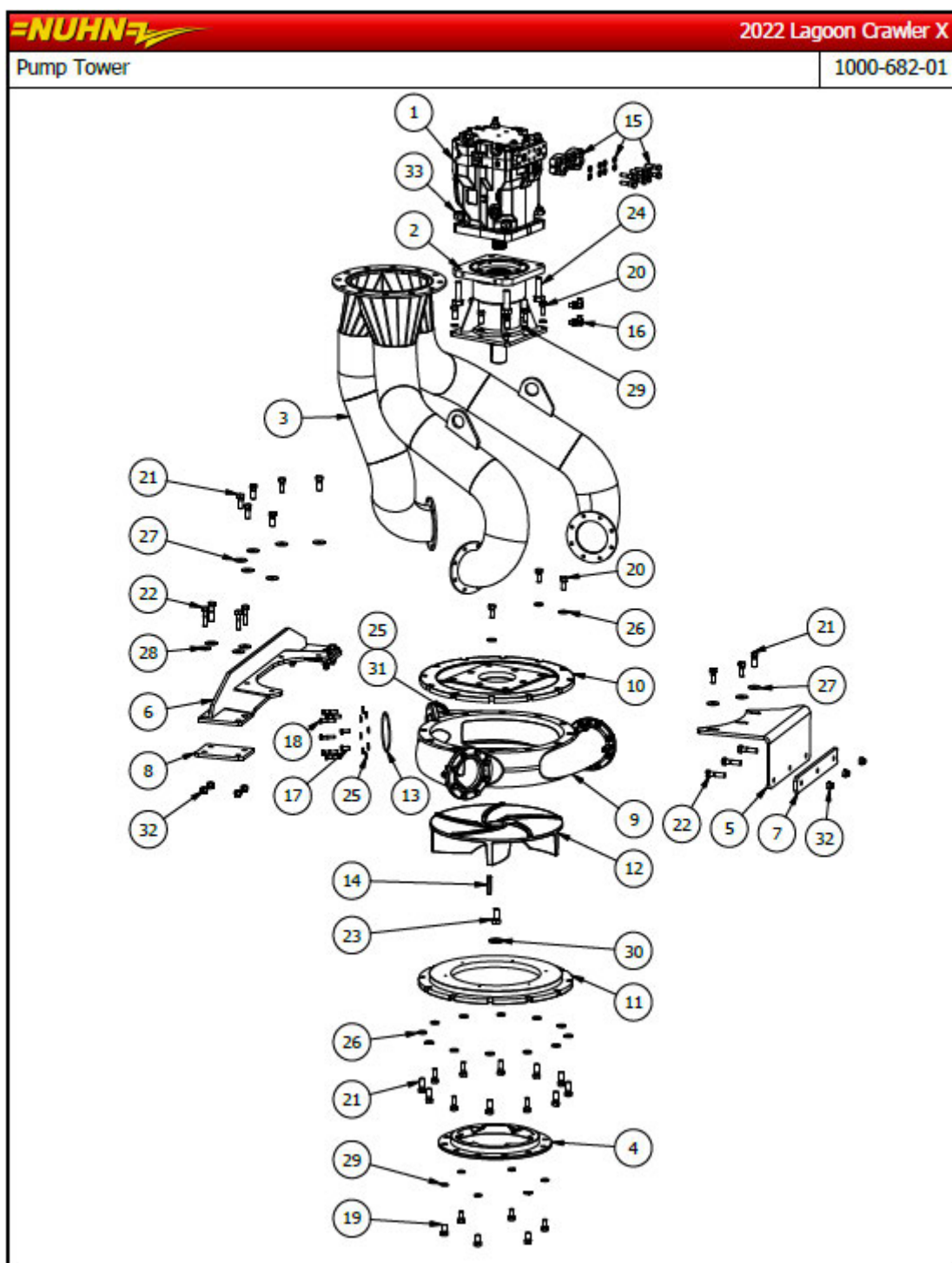
334. A brochure for the Lagoon Crawler X shows the pump submerged within liquid manure when the vehicle is floating in the lagoon.



EX2046, 2.

The immersible liquid manure pump of the liquid manure mover including a substantially vertical drive shaft powering an impeller ('835 Patent, substitute claim 41, 79, 80)

335. The parts catalog for the 2022 Lagoon Crawler X illustrates a pump tower with a vertically oriented shaft and a semi-open impeller.



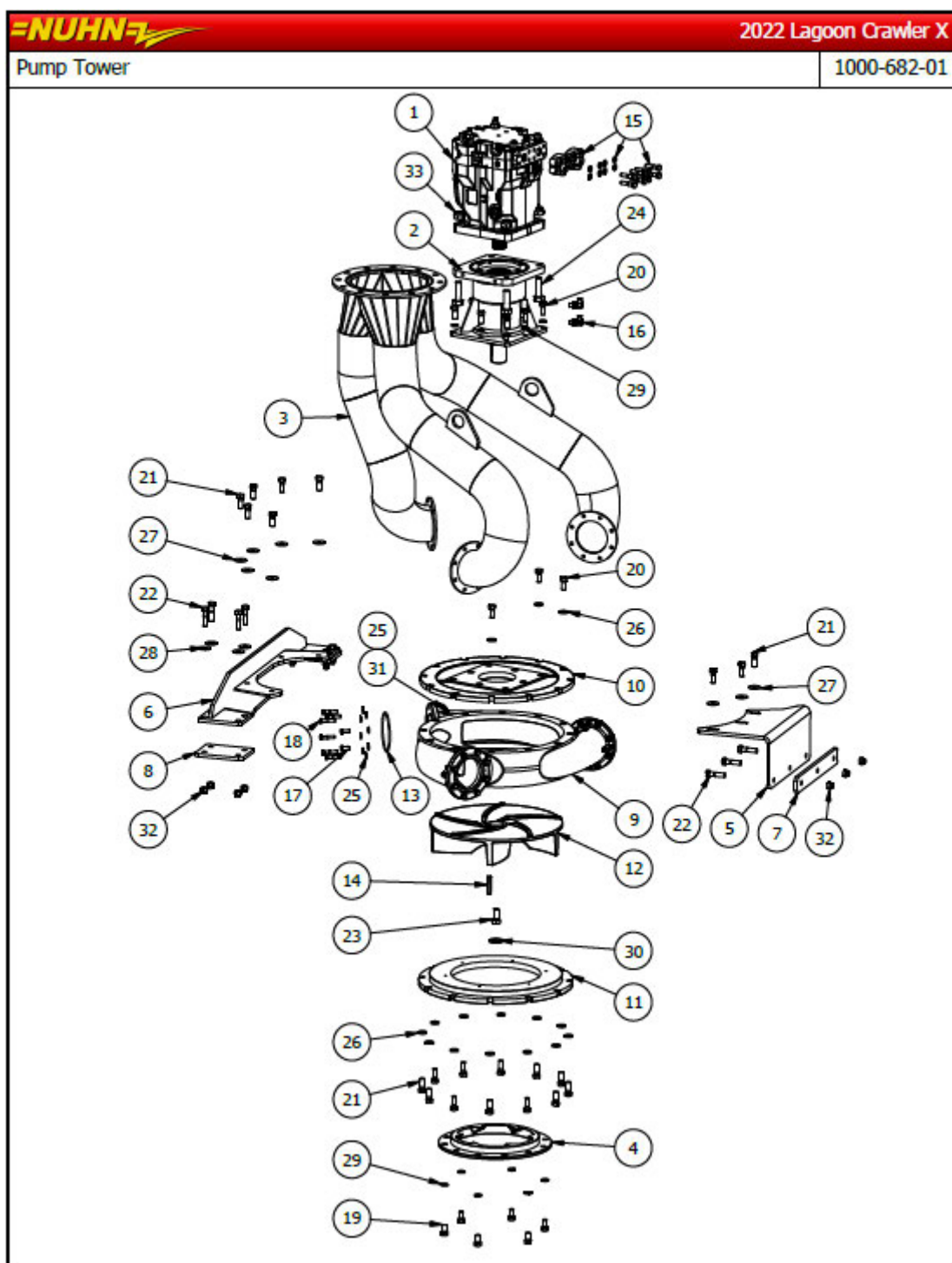
EX2047, 36.

			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

Id., 37.

The immersible liquid manure pump of the liquid manure mover including a housing and the impeller located in a space between the four ground engaging wheels ('835 Patent, substitute claim 79)

336. The parts catalog for the 2022 Lagoon Crawler X illustrates a pump comprising an impeller and housing.

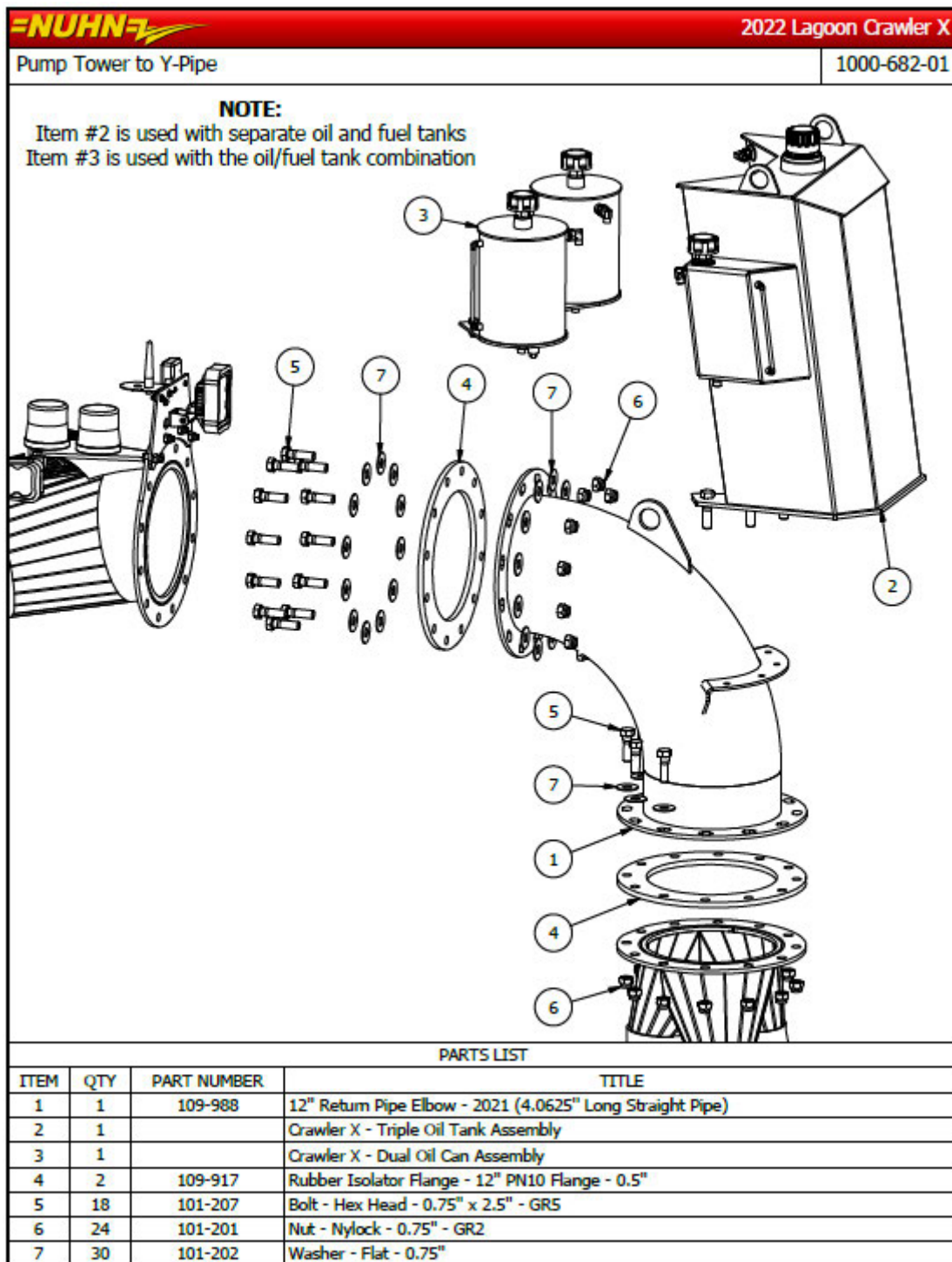


Id., 36.

=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
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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

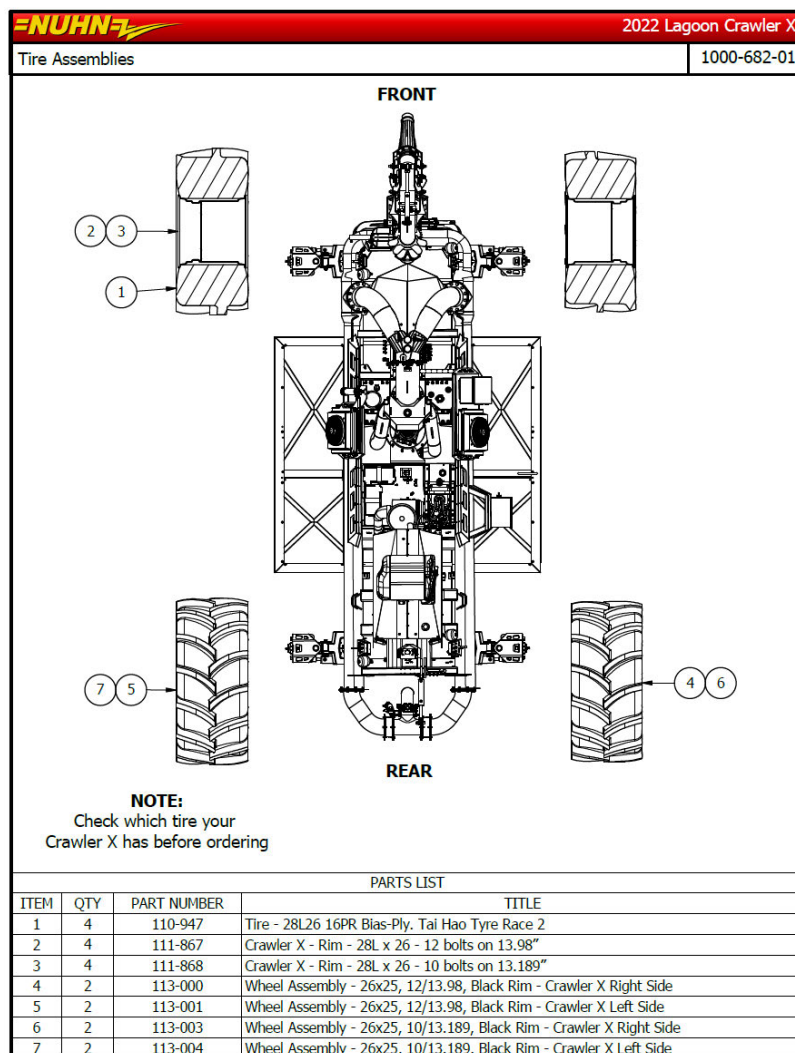
Id., 37.

337. The parts catalog for the 2022 Lagoon Crawler X illustrates the positioning of the pump below a Y-pipe.



Id., 31.

338. The parts catalog for the 2022 Lagoon Crawler X illustrates the positioning of the Y-pipe, which is directly above the fluid pump, in between the four ground engaging wheels.



Id., 42.

The at least one fluid nozzle positioned above the floatable vehicle body to direct a flow of liquid manure from the liquid manure mover through the air and back into the manure lagoon ('835 Patent, substitute claim 57)

339. A video of the Lagoon Crawler X shows a flow of liquid manure propelled from a nozzle through the air and back into the lagoon.

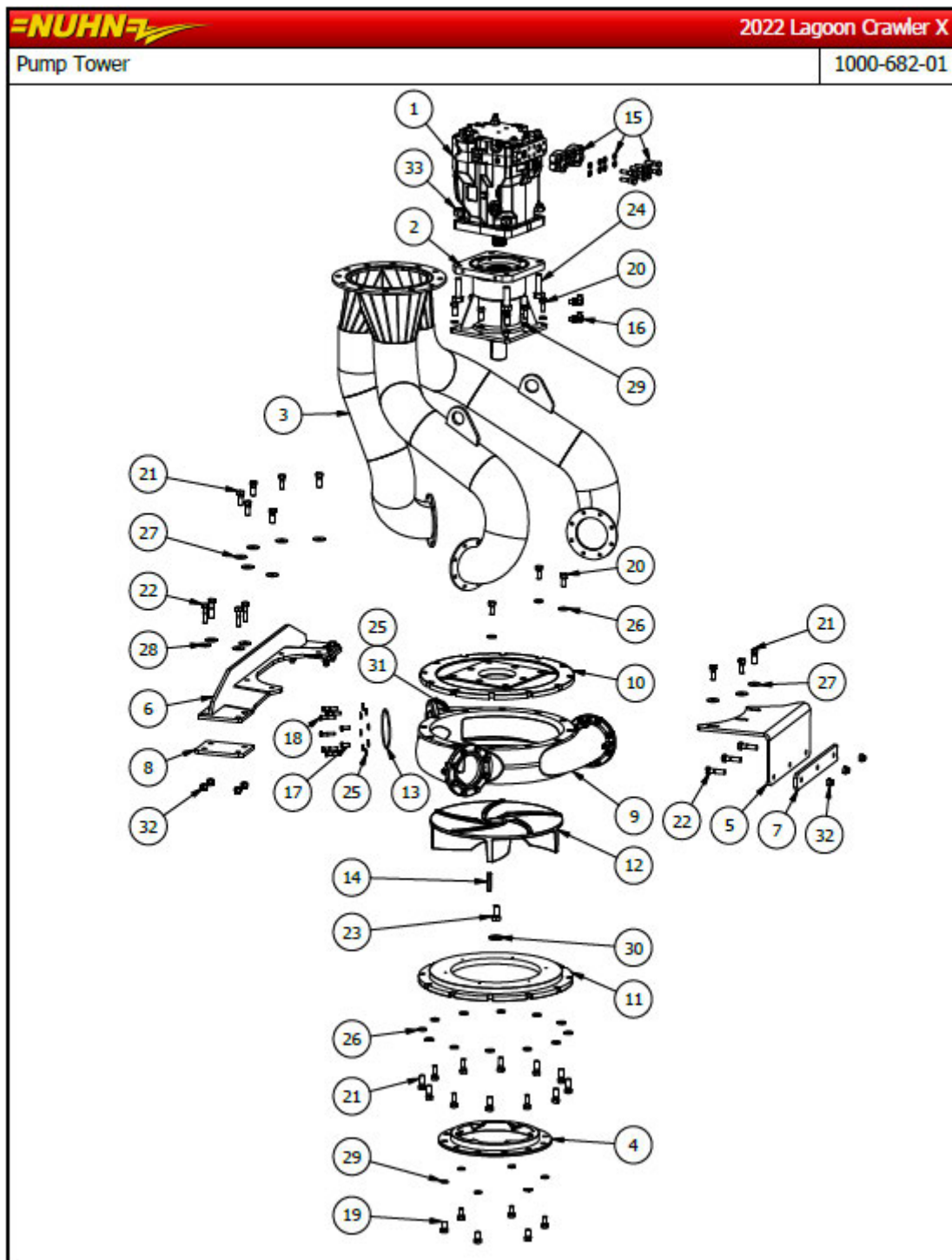


EX1155, 2.

The at least one fluid nozzle is forward of the power source while the liquid manure pump is rearward of the power source ('835 Patent, substitute claim 41, 80)

340. The parts catalog for the 2022 Lagoon Crawler X illustrates a pump comprising an impeller and housing.

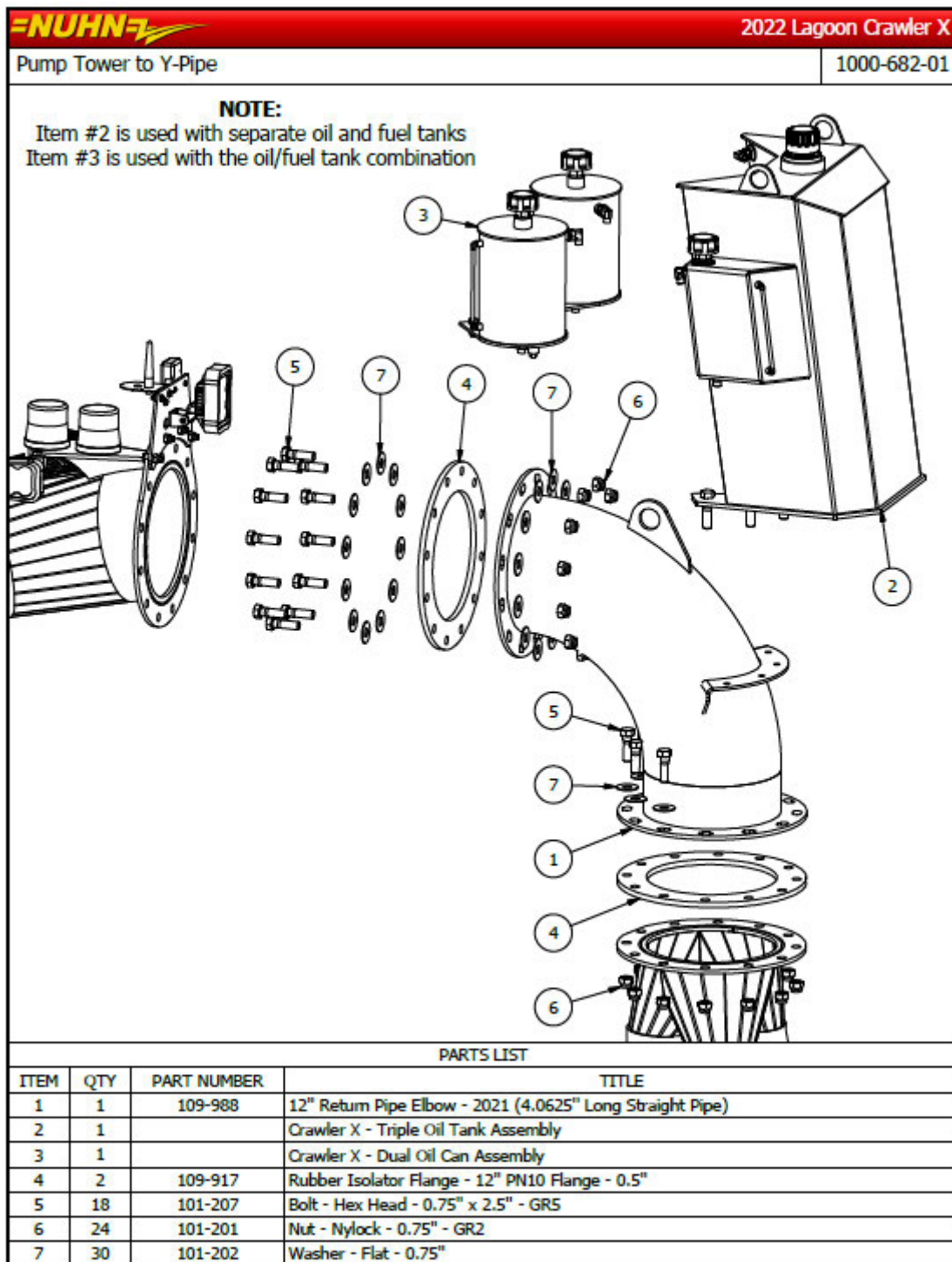
EX2047, 36.



=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
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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

Id., 37.

341. The parts catalog for the 2022 Lagoon Crawler X illustrates the positioning of the pump below a Y-pipe.



Id., 31.

342. A brochure for the Lagoon Crawler X shows the Y-pipe, which is directly above the fluid pump, rearward of the engine, and a fluid nozzle forward of the engine.



EX2046, 2.

343. As described above, each of the features noted above are described in patents or pending claims before the USPTO. Nuhn characterized these features as being *material* and *contributing directly* to both its products' commercial success and new, unexpected results. Each of these features is present in Nuhn's Lagoon Crawler products. Accordingly, given that Nuhn's secondary considerations are tied to features other than those recited in the '708 Patent claims, it is my opinion that there is no nexus between Nuhn's secondary considerations evidence and the claims of the '708 Patent.

B. Nuhn's Long Felt Unsolved Need Was Already Solved.

344. Nuhn and Mr. Prairie argue that Nuhn solved the problem of breaking a crust on a large lagoon, mixing solids, and forming a slurry. Nuhn's characterization of the alleged "long felt need" is belied by the '708 Patent's

specification, which only identifies the problem with shore-based, tractor mounted agitators that cannot “recirculate manure to the middle of large lagoons.” EX1001, 1:40-49. The problem identified by the ’708 Patent was agitating the manure in the middle of large lagoons with land-based agitators. However, the Background does not even mention floating agitation vehicles, such as Puck, or amphibious agitation vehicles, such as SenwaTec, that were already used agitate the middle of large lagoons.

345. Moreover, crust is only mentioned three times in the Specification, and it is clear that a crust is not always present, but the sediments on the bottom of the lagoon need to be agitated. Importantly, the background of the ’708 Patent teaches exactly what was used to break up crust: “[p]umps are employed for this purpose [to break up crusts] 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.*, 1:33-52. That is exactly what shore-based agitators used and what Nuhn’s alleged invention discloses, i.e. pumps and nozzles, and what the prior the prior art, such as Puck and SenwaTec, relied upon herein teach.

346. Nuhn argues that it solved the problem of breaking a crust, mixing solids, and forming a slurry in large lagoons. But Puck’s product was already available before Nuhn filed its provisional application. EX1099. As described in the Puck patent application publication, the Puck vehicle was equipped to “break[] up

the crust (126)” and “cause the sludge (130) at the bottom (138) of the lagoon (22) to mix with the supernatant (128) and form [a] slurry (50).” EX1014, ¶[0036]. Mr. Prairie alleges that Puck’s vehicle did not have any design problems and would have adequately addressed each of these needs. IPR2023-01161, EX2029, ¶306. These were the same “long felt need[s]” that were supposedly solved by Nuhn’s vehicle. And while Nuhn mentions its vehicle’s ability to pump liquid manure from a lagoon into a tank, that feature is never even mentioned in the ’708 Patent, let alone the claims. Any ‘need’ met by the vehicle of the ’708 Patent was already solved prior to its effective filing date.

C. Nuhn’s Amphibious Vehicle Provided Only Expected Results.

347. I understand that unexpected results used to support patentability of a claimed feature must be tied to the limitations recited in the claims.

348. Regarding Nuhn’s “unexpected results,” Nuhn and Mr. Prairie argue extensively about the “pocket” created by the vehicle and how this “pocket” “start[s] a ‘working zone’ for the liquid manure pump to operate in[.]” Paper 21 at 19-21. However, to the extent that this pump/pocket arrangement refers to anything other than what is already disclosed in Truxor or SenwaTec, that arrangement does not appear in any of the claims of the ’708 Patent, which say nothing about where the pump is located on the vehicle or in relation to the lagoon. Rather, the only relevant difference from Truxor or SenwaTec that appears in the claims of the ’708 Patent is

the remote control of the vehicle components—a feature that was added to those products in 2013 and 2016, respectively. EX1109, 185:3-10; EX1110, 109:16-22. Allowing the operator to control the vehicle functions from outside the vehicle is not an unexpected result from the addition of remote control.

349. Mr. Prairie also identifies the vehicle being able to crawl through, rather than over, the crust of a liquid manure lagoon as an “unexpected result.” This is also an unclaimed feature, and not all liquid manure lagoons even have crusts. As for those that do, a POSA would have understood that an amphibious vehicle would be heavy enough to break through a crust on a lagoon and could assist in agitating the material contained in the lagoon. Once again, this is the same result that was realized by the use of the SenwaTec product in manure reservoirs. *Supra* Section VIII.B.

350. Nuhn also notes how others were skeptical of the placement of the nozzles/pump on the vehicle. Specifically, Nuhn alleges that others were skeptical about whether this configuration would be controllable or whether the pump would clog. Paper 21 at 24. However, Nuhn completely ignores that Puck was already successfully using this same arrangement of a pump with a bottom fluid inlet and nozzles in its product before 2013. *See, e.g.*, EX1014; EX1099. As Nuhn concedes, Puck was the market leader in large lagoon agitation at that time. These features were well understood and accepted prior to Nuhn’s alleged invention.

D. The Lagoon Crawler Implemented Only Known Features.

351. Nuhn argues that prior to its alleged invention, others were skeptical about the development of the Lagoon Crawler and the results achieved by the Lagoon Crawler product were “unexpected.” However, others were already successfully using and marketing these techniques for manure agitation before 2013.

352. Nuhn attributes the skepticism of its product to concerns regarding the performance of the hydraulically driven wheel system in a manure lagoon. However, Nuhn ignores the fact that others, including UD Umwelt-Dienste (SenwaTec) and Sealegs (the commercial embodiment of Bryham), were already using and marketing amphibious vehicles with hydraulically driven wheels in sewage reservoirs and other corrosive environments prior to Nuhn’s alleged invention. *See* EX1012; EX1015; EX1031; EX1111; EX1113.

E. Bazooka’s Wolverine Product Is not a Copy of Nuhn’s Lagoon Crawler.

353. It is my opinion that Bazooka’s Wolverine product is not a copy of the Lagoon Crawler. I understand that the Wolverine utilizes propellers to agitate and propel its vehicle, not nozzles, as utilized by the Nuhn’s Lagoon Crawler. EX2104, 1; *see* EX1001 (“[T]he vehicle does not comprise a propeller.”). Propeller propulsion and nozzle propulsion are different methods of propelling vehicles in fluid, have different efficiencies, and produce different fluid flow results. Additionally,

propellers and pumps/nozzles differ in their respective agitation capabilities and characteristics. I also understand that Bazooka's Wolverine product does not include wheels that raise and lower relative to the vehicle body, as is the case in Nuhn's Lagoon Crawler products.

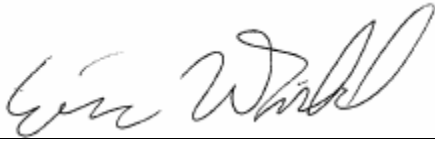
354. In this same vein, I understand that Bazooka's product also only includes a single fluid outlet (as opposed to the seven outlets of the Lagoon Crawler) and lacks any kind of valve structure that is used to selectively direct the flow of manure through its fluid conduit. Removal of these extraneous features may be beneficial, as it may reduce cost, complexity, and number of failure modes for the vehicle.

XVI. CONCLUSION

355. I reserve the right to supplement my opinions as appropriate.

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

Submitted by:



Eric S. Winkel, Ph.D., P.E., CFEI,
CVFI
Senior Consultant

November 6, 2024

Date

Appendix A

List of Materials Considered

Patents and Patent Applications

- U.S. Patent No. 8,256,692 (Knowles)
- U.S. Patent No. 10,118,138 (Tews)
- Preliminary Amendment of U.S. Patent Application No. 18/073,035

Declarations

- Affidavit of Nathaniel E. Frank-White Regarding the Nuhn Header Series Vertical Pit Pump, Dated Jul. 18, 2023

Non-Patent Literature

- *Air - Density vs. Pressure and Temperature*, ENG'G TOOLBOX, https://www.engineeringtoolbox.com/air-temperature-pressure-density-d_771.html (last visited Nov. 6, 2024)
- *Anatomy of a Tire*, P2 INFOHOUSE (Nov. 6, 2024), <https://p2infohouse.org/ref/11/10504/html/intro/tire.htm>
- Brian Trompeter, *Company Hopes Amphibian Unit Will Be Game-Changer in Emergency Response*, INSIDENOVA (Feb. 9, 2012), https://www.insidenova.com/news/arlington/company-hopes-amphibian-unit-will-be-game-changer-in-emergency-response/article_2ed36532-078d-5982-8fec-75dd7a15042f.html
- CAD Image Depicting Lagoon Crawler Side View Produced as NUHN15000127406 in the '015 Litigation
- CAD Image Depicting Lagoon Crawler Top View Produced as NUHN15000127407 in the '015 Litigation
- *Cavity*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/cavity> (last visited Nov. 6, 2024)
- Deposition Transcript of Douglas Prairie, Taken on October 29, 2024
- Deposition Transcript of Dr. Reinhard Speerschneider, taken on October 23, 2024
- Deposition Transcript of Ian Nuhn, Taken on October 28, 2024
- Deposition Transcript of Maurice Bryham, taken on October 29, 2024
- Mike Hanlon, *Humdinga - the 4WD amphibious vehicle*, NEW ATLAS (Jan. 20, 2004), <https://newatlas.com/humdinga-the-4wd-amphibious-vehicle/2823/>
- NORTHAMERICAN MANUREXPO, PROFESSIONAL APPLICATION: INNOVATION & TECHNOLOGY (2012)
- Paul M. Mayer et al., *Where the rubber meets the road: Emerging environmental impacts of tire wear particles and their chemical cocktails*, 927 SCI. TOTAL ENV'T 171153 (June 1, 2024), <https://doi.org/10.1016/j.scitotenv.2024.171153>
- Raul Lutas, *What is the Density of Steel?*, BUY BEAM: STEEL BEAMS (Sept. 26, 2022), <https://buyabeam.com/blogs/steel-beams/what-makes-steel-so-dense/>
- U.S. WAR DEP'T, TM 9-802 TRUCK, AMPHIBIAN, 2 1/2 TON, 6 X 6 GMC DUKW-353, 1942 (1947)

- VAL S. LOBANOFF & ROBERT R. ROSS, CENTRIFUGAL PUMPS: DESIGN & APPLICATION (2nd ed. 1992)
- Water Science School, *Water Density*, USGS (June 5, 2018), <https://www.usgs.gov/special-topics/water-science-school/science/water-density#:~:text=In%20practical%20terms%2C%20density%20is,cubes%20float%20in%20your%20glass>