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Expert Declaration Of Eric S. Winkel, Ph.D., P.E. In Support Of Petitioner's Reply to Patent Owner's Response – Case IPR2023- 01161

Bazooka Farmstar, LLC v. Nuhn Industries, Ltd.

ESi Matter No: 97175

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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: IPR2023-001161

U.S. Patent No. 11,358,425

EXPERT DECLARATION OF ERIC S. WINKEL, PH.D., P.E.
IN SUPPORT OF PETITION FOR *INTER PARTES*
REVIEW OF U.S. PATENT NO. 11,358,425

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	SUMMARY OF OPINIONS	1
III.	LEGAL PRINCIPLES	1
	A. Invalidity by Anticipation, Obviousness, and Interpreting Claims Before the Patent Office	2
	B. Means-Plus-Function Claim Terms	2
	C. Secondary Considerations	4
	D. Materials Considered	6
IV.	BACKGROUND	7
V.	PERSON OF ORDINARY SKILL IN THE ART	9
VI.	CLAIM CONSTRUCTION	14
	A. “Fluid Pump for Pumping Liquid Manure”	14
	i. Nuhn Failed to Identify Any Structure Associated with a Pump for Pumping Liquid Manure.	15
	ii. [REDACTED] “Liquid Manure” Includes Low Solid Content Forms of Manure.	16
	iii. Mr. Prairie’s Arguments Concerning Liquid Manure Are Wrong.	18
	B. “Fluid Mover”	22
VII.	GROUND 1: CLAIMS 1-21 ARE ANTICIPATED BY CARRIER	27
	A. Claim 1	27
	i. Carrier Discloses a Fluid Pump for Pumping Liquid Manure.	28
	a. Carrier Discloses a Fluid Pump.	28
	b. A POSA Would Have Understood the Carrier Pump to Have the Same Structure as Fluid Pumps for Pumping Liquid Manure.	28
	c. The Carrier Pump at Least Pumps Dilute Forms of “Liquid Manure.”	31

d.	Nuhn’s Counterarguments Are Wrong.....	32
ii.	The Wireless Remote Control Limitations of Claim 1	34
B.	Claims 7 and 19	37
C.	Claims 8-11 and 20-21	40
D.	Claim 12	43
E.	Claims 2-6, 8, and 13-18	45
VIII.	GROUND 2: CLAIMS 1-7 AND 12-19 ARE RENDERED OBVIOUS BY TRUXOR IN VIEW OF YOON OR CARRIER.....	47
A.	Motivation to Combine	47
B.	Claim 1	54
i.	Truxor Discloses a Fluid Pump for Pumping Liquid Manure.	55
ii.	The Combination of Truxor and Yoon or Carrier Discloses the Remote-Control Limitations of Claim 1.....	67
iii.	Truxor Discloses the Claimed Combination of Elements.	68
iv.	A POSA Would Have Had a Reasonable Expectation of Success in Combining Truxor with Yoon or Carrier.....	69
C.	Claims 7 and 19	70
D.	Claim 12	75
E.	Claims 2-6, 13-18	77
IX.	GROUND 3: CLAIMS 1-7 AND 12-19 ARE RENDERED OBVIOUS BY SENWATEC IN VIEW OF YOON OR CARRIER	78
A.	Motivation to Combine	79
B.	Claim 1	79
i.	SenwaTec Discloses a Fluid Pump for Pumping Liquid Manure.	80
ii.	The Combination of SenwaTec and Yoon or Carrier Discloses All of the Remote-Control Limitations of Claim 1.....	89
iii.	SenwaTec Discloses the Claimed Combination of Elements...	90

iv.	A POSA Would Have Had a Reasonable Expectation of Success in Combining SenwaTec with Yoon or Carrier.	91
C.	Claims 7 and 19	95
D.	Claim 12	98
E.	Claims 2-6, 8, and 13-18	99
X.	GROUND 4: CLAIMS 1-21 ARE RENDERED OBVIOUS BY THE COMBINATION OF PUCK AND BRYHAM.....	101
A.	Motivation to Combine	101
B.	Claim 1	104
i.	The Combination of Puck and Bryham Discloses a Power Source Configured to Provide Power to Both the Ground Engaging Propulsion Structure and the Fluid Pump.....	104
ii.	The Combination of Puck and Bryham Discloses Remote Control Configured to Control the Ground Engaging Means.	109
iii.	A POSA Would Have Had a Reasonable Expectation of Success in Combining Bryham with Puck.....	113
C.	Claim 13	123
D.	Claims 2-12 and 14-21	125
XI.	GROUND 5: CLAIMS 1-21 ARE RENDERED OBVIOUS BY THE COMBINATION OF PUCK AND BRYHAM AND BENNETT-II.....	127
A.	Motivation to Combine	127
B.	Claim 1	128
i.	The Combination of Puck, Bryham, and Bennett-II Disclose Remote Control Configured To Control The Ground Engaging Propulsion Structure.	129
ii.	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.	132
iii.	A POSA Would Have Had a Reasonable Expectation of Success in Combining Puck, Bryham, and Bennett-II.	134
C.	Claim 13	134

D.	Claims 2-12 and 14-21	136
XII.	GROUND 6: CLAIMS 1-21 ARE ANTICIPATED BY LYSENG	138
XIII.	SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS	138
A.	The Challenged Claims Lack Nexus to Nuhn’s Secondary Considerations.	138
i.	Nuhn’s Gen 1 Lagoon Crawler (MY2014-MY2017).....	141
ii.	Nuhn’s Gen 2 Lagoon Crawler (My2018).....	153
iii.	Nuhn’s Gen 3 Lagoon Crawler (My2020-My2022).....	168
iv.	Nuhn’s Crawler X.....	183
B.	Nuhn’s Long Felt Unsolved Need Was Already Solved.	202
C.	Nuhn’s Amphibious Vehicle Provided Only Expected Results.	204
D.	The Lagoon Crawler Implemented Only Known Features.	206
E.	Bazooka’s Wolverine Product Is not a Copy of Nuhn’s Lagoon Crawler.	207
XIV.	CONCLUSION.....	207

TABLE OF ABBREVIATIONS

Abbreviation	Definition
Bazooka or Petitioner	Bazooka-Farmstar, LLC
Bennett	U.S. Patent Application Publication No. 2014/0288763
Bennett-II	U.S. Patent Application Publication No. 2021/0331752
Bradley	Great Britain Patent No. 2,366,218
Bryham	U.S. Patent No. 7,314,395
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
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
Manure Manager	MANURE MANAGER, Jan./Feb. 2011 (EX1088)
Manure Manager II	MANURE MANAGER, July/Aug. 2011 (EX1089)
Nuhn	Patent Owner or Nuhn Industries Ltd.

Abbreviation	Definition
Nuhn Pump	Patent Owner's pump disclosed in Manure Manager (EX1089, 27).
Patent Owner	Nuhn Industries Ltd.
POSA	Person of Ordinary Skill in the Art
Puck	U.S. Patent Application Publication No. 2014/0112093
PTAB	U.S. Patent Trials and Appeals Board
Respondent	Patent Owner or Nuhn Industries Ltd.
The '125 Application	U.S. Patent Application No. 17/590,125
The '133 Provisional	U.S. Provisional Patent Application No. 61/805,133
The '224 Patent	U.S. Patent No. 11,448,224 (continuation of the '758 Patent)
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

Abbreviation	Definition
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 '758 Patent	U.S. Patent No. 8,944,758 (incorporated-by-reference into the '425 Patent)
The '789 PCT	PCT Application No. PCT/CA2014/050,789
The '835 Patent	U.S. Patent No. 11,491,835
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) (EX1021)
Truxor-III	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (2013) (EX1022)

Abbreviation	Definition
Truxor-IV	DOROTEA MEKANISKA AB, TRUXOR AMPHIBIAN TOOL CARRIER (EX1023)
SenwaTec	SENWATEC-SCHRÖER UMWELT-& GEWÄSSERTechnologie GmbH & Co. KG, LIGHT AMPHIBIOUS BOAT/VEHICLE “AMPHI-KING®” SWT--AB380 (EX1012)
Sundstrom	The Sundstrom Boat (Referenced in EX1115)
USPTO	United States Patent and Trademark Office
Yoon	KR Publication No. 20130016490

I. INTRODUCTION

1. I have been retained by Merchant & Gould P.C. to serve as an expert on behalf of Bazooka in the above-referenced matter to provide my technical review, analysis, and opinions concerning the validity of claims 1-21 of the '425 Patent.

2. I previously executed a declaration relating to the validity of the '425 Patent claims, which I understand was filed with Bazooka's petition for *inter partes* review of the '425 Patent as EX1004. I am providing this declaration as a supplement to my prior declaration to address the arguments made by Nuhn and Dr. Burns in conjunction with Nuhn's Patent Owner Response. *See* Paper 27 and EX2029.

3. 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

4. A summary of my opinions regarding the validity of claims 1-21 of the '425 Patent is provided in my previous report. EX1004, ¶¶12-18. My opinions on these topics remain unchanged since the filing of that report.

III. LEGAL PRINCIPLES

5. 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

6. My prior declaration, executed on June 29, 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. Means-Plus-Function Claim Terms

7. I understand that 35 U.S.C. §112(f) allows a patentee to claim an invention in functional rather than structural language. I understand that this form of claim drafting is referred to as means-plus-function claiming. I understand that means-plus-function claiming applies only to purely functional limitations that do not provide the corresponding structure for performing the claimed function.

8. I understand that the interpretation of claim language as a means-plus-function limitation under 35 U.S.C. §112(f) is a legal question that is based on the following underlying factual questions: (1) whether the words of the claim are understood by persons of ordinary skill in the art (POSAs) to have a sufficiently definite meaning as the name for structure, and (2) what structure is disclosed in the specification for performing the claimed function. I understand the PTAB will determine as a matter of law whether a term or phrase is a means-plus-function claim limitation. I am not providing an opinion on the legal question of whether any phrases are means-plus-function limitations; however, I have provided my opinions

on the underlying factual determinations as to what a POSA would have understood about specific claim terms and the content of the specification.

9. I understand that the presence of the word “means” in a claim creates the presumption that the claim term is a means-plus-function claim term. Likewise, I understand that the absence of the word “means” in a claim creates the presumption that the claim term is not a means-plus-function claim term. However, I understand that this presumption is not a strong presumption. I understand that the key inquiry for determining whether a claim term is a means-plus-function term is whether the words of the claim are understood by persons of ordinary skill in the art (POSA) to have a sufficiently definite meaning as the name for structure.

10. I understand that once a claim term is determined to be a means-plus-function term, then the function recited in the claim must be determined. I understand that the function of a means-plus-function claim term is defined only by the words of the claim language. I also understand that a means-plus-function claim term may recite multiple functions, in which case, the corresponding structure in the specification must perform all the functions recited in the claim.

11. Once the function of a claim is determined, I understand that the structure in the specification corresponding to the claimed function must be determined. I understand the corresponding structure is the structure in the

specification that performs all of the functions recited in the means-plus-function claim term.

C. Secondary Considerations

12. 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.

13. 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.

14. 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.

15. 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-obviousness.

16. 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.

17. 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.

18. 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.

19. I understand that a claim-embodying 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.

D. Materials Considered

20. 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

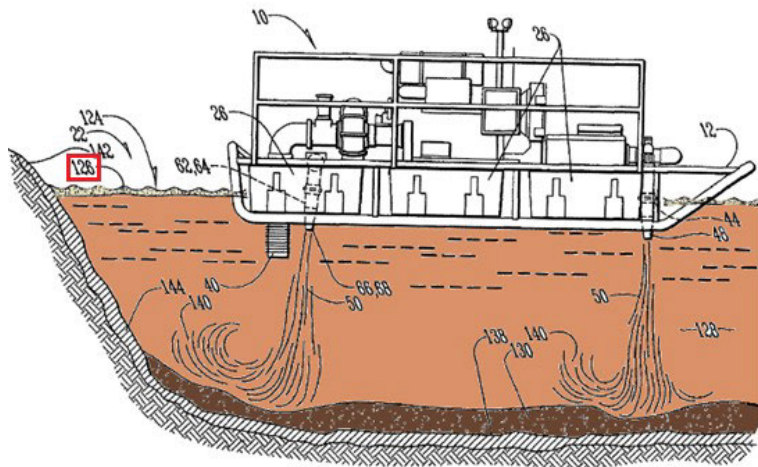
referenced in my prior declarations submitted in conjunction with IPR2023-01161, the materials referenced in my declarations submitted in conjunction with IPR2024-00004 and IPR2024-00098, the declaration and materials referenced in the declarations of Douglas Prairie (EX2004, EX2029), and the additional materials provided in Appendix A.

IV. BACKGROUND

21. The '425 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, 1:33-35) after which the diluted “[l]iquid manure ... [is] *irrigate[d]* onto farm land for disposal.” EX1029, 1:14-17 (emphasis added) (incorporated-by-reference).

22. 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]. At that point, conventional farmland irrigation (water pumping) equipment may be used to pump

the nutrient-rich liquid manure mixture onto farmland for fertilization. EX1029, 1:14-17; EX1040, 64; EX1064, 15; EX1066, 88; EX1114, ¶7. Using this irrigation equipment, liquid manure is transferred “at a much faster rate than hauling,” making the application process more efficient. EX1064, 15.



EX1014, FIG. 4 (annotated).

23. 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 '425 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[.]” EX1063, 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

24. 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 27 at 13; EX2004, ¶¶63.

25. Along with his own definition, Mr. Prairie offers two criticisms (EX2029, ¶¶58-59) of my previously provided POSA definition. EX1004, ¶¶81-82. First, Mr. Prairie alleges that my definition excludes those most familiar with manure agitation equipment. EX2029, ¶58. 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.*, ¶59. 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.

26. As support for his POSA definition, Mr. Prairie states that the ’425 Patent has been classified as being directed to “amphibious vehicles specially adapted for particular purposes” and “manure” handling. Mr. Prairie also opines that the claimed vehicle has no utility in doing anything other than operating in manure lagoons. EX2029, ¶¶59-61.

27. However, as the PTAB correctly found in its institution decision, the ’425 Patent is not limited to liquid manure lagoons. Paper 12 at 8-9. Instead, the summary of the invention and preamble of the claims are directed to a general “amphibious pumping vehicle.” EX1001, 1:56-57; 8:36. While the ’425 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, 2:21-24; EX1029, 4:3-9 (incorporated-by-reference).

28. 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.” EX2029,

¶63. 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.

29. While a livestock farmer or manure applicator may certainly be capable of servicing or performing maintenance on farming equipment, as alleged by Mr. Prairie, a farmer is not equipped to design a multi-functional amphibious vehicle like the one described in the '425 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.

30. 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.* 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.

31. 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.

32. Furthermore, as acknowledged by the PTAB, Petitioner’s definition of a POSA properly includes a broad familiarity with “fluid pumps and livestock manure.” Paper 12 at 9. Nuhn faults this definition for not requiring a POSA to have “imperative” hyper-specific knowledge of “storage places for manure[.]” Paper 27 at 13-14. 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 27 at 13.

33. It is my opinion that Mr. Prairie is not a POSA. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

VI. CLAIM CONSTRUCTION

34. I understand that, in addition to “a fluid pump for pumping liquid manure,” Nuhn now identifies the term “fluid mover” as requiring construction. It is my opinion that Nuhn’s claim constructions of both terms are wrong.

A. “Fluid Pump for Pumping Liquid Manure”

35. It is my opinion that the claim terms “for pumping liquid manure” and “to control a flow of liquid manure” are merely statements of intended use for the fluid pump recited in the claims. This is because the specification does not provide any specific structure associated with or required “for pumping liquid manure.” EX1004, Section IV.F.i.a. Furthermore, the extrinsic evidence demonstrates that no specific structure is required for pumping liquid manure. EX1004, Section IV.F.i.b. This is supported by the prior art literature, which shows that conventional water and irrigation pumps have long been used to pump liquid manure. EX1004, Section V.B.iii.a.

36. The PTAB’s preliminary construction of the term “fluid pump for pumping liquid manure” also properly covers a “pump with a structure that is

capable of pumping liquid with suspended solids.” Paper 12 at 12. In its Response, Nuhn fails to identify any specific structure required by this term. Mr. Prairie has not provided any associated structure in his declaration and, in fact, was unwilling to provide any description of the structure of a liquid manure pump in deposition testimony. *Supra* Section V. As described below, a POSA would have understood that the structure of such a pump would include a water pump capable of pumping high volumes of water from lakes and streams.

i. Nuhn Failed to Identify Any Structure Associated with a Pump for Pumping Liquid Manure.

37. Nuhn argues in its Response that “a fluid pump for pumping liquid manure” communicates to a POSA that the fluid pump should be limited to the structure disclosed in the “four corners of the ’425 Patent” and its equivalents. Other than broadly referring to its specification, which does not include specific structural requirements for a fluid pump capable of pumping liquid manure, Nuhn provides no other identification of the structural features associated with a fluid pump for pumping liquid manure. [REDACTED]

[REDACTED]

38. It is my opinion that a POSA would have understood the term “a fluid pump for pumping liquid manure” to not be limited to the four corners of the ’425 Patent specification—which only describes submersible impeller centrifugal multi-

outlet pumps—when multitudes of other pumps have long been used for pumping liquid manure. *See, e.g.*, EX1040 at 52 (identifying ten distinct types of “[l]iquid manure handling pumps”).

ii. [REDACTED] **“Liquid Manure” Includes Low Solid Content Forms of Manure.**

39. 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 ’425 Patent distinguishes between these “smaller pits” ((EX1001, 1:42) containing higher solid contents manure) and “large lagoons” ((*id.*, 1:47) 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.*, 1:26-29; EX1029, 1:14-17. And Nuhn’s own evidence states that “crusts do not occur on pig slurry stores[.]” EX2030 at 6. [REDACTED]

[REDACTED] And the ’425 Patent, which is directed to “hog and cattle manure,” notes that “during storage, a crust *can* develop[.]” EX1001, 1:33-38 (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. EX1054, 76 (describing typical solid contents levels in pits versus lagoons); EX1121, 5 (same).

40. “Liquid manure” is understood in the literature as a mixture of water and manure with a total solid content of less than about 5%. EX1066, 89; 1064, 11-14 (“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....”); EX1062, 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.”); 1041, 2; 1042, 2. [REDACTED]

[REDACTED] 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%.” [REDACTED]

[REDACTED] As acknowledged by the ’425 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.” EX1040, 64; *see* EX1042, 5; EX1054, 80; EX1029, 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.

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

41. Mr. Prairie contends that my positions do not account for pre-agitation characteristics of liquid manure or the crust on lagoons. EX2029, ¶67. 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, or 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.

42. Mr. Prairie also notes that AWMFH, one of the references relied upon for my opinions related to the solids content of liquid manure (EX1062), also provides that these ranges “must be considered generalizations subject to variation and interpretation.” EX2029, ¶71. 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. EX1040, 64; EX1062, 13. Similarly, a POSA would have understood that the range of solids concentration considered liquid may vary somewhat from one source animal to another. EX1064, 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.*, EX1040, 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* EX1042, 5; EX1054, 80.

43. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

44. 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 ’425 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 ’425 Patent would not have understood the ’425 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. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

45. 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. EX2029, ¶75. 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. EX1054, 76; EX1121, 5.

46. Mr. Prairie instead cites other patents, alleging that these patents use liquid manure broadly to refer to the contents of lagoons. EX2029, ¶76. Mr. Prairie is wrong. He provides no citations that would support his position that solids, and trees, and six-foot-thick crusts are liquid. The large majority 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 contents manure. Those references that do describe liquid manure handling technology say nothing about the percentages of total solids found within a liquid manure lagoon. 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.

47. Citing a *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. EX2029, ¶82. Mr. Prairie’s reliance on this reference and his conclusion is incorrect. Obviously, small trees are not growing on the liquid manure or suspended solids in liquid manure, it is growing on a solid crust, which is not liquid and is not liquid manure. It is crust. It is equally

hard to imagine a POSA would have considered small trees to be “liquid” or being considered “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 ’425 Patent. Furthermore, this very same reference acknowledges that “crusts do not occur on pig slurry stores[.]” EX2030 at 6. Mr. Prairie’s assertions that liquid manure always includes a crust are contradicted by his own cited evidence.

B. “Fluid Mover”

48. I understand that Nuhn argues in its Patent Owner Response that “fluid mover” should be afforded a means-plus-function construction. Paper 27 at 18-19. If the PTAB applies a mean-plus-function construction, it is my opinion that the term should be interpreted as a “pump, conduit, and nozzle.”

49. It is my understanding that the interpretation of claim language as a means-plus-function limitation under 35 U.S.C. §112(f) is a legal question that is based on the following underlying factual questions: (1) whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure, and (2) what structure is disclosed in the specification for performing the claimed function. I am not providing an opinion on

the legal issue of whether this phrase is a means-plus-function limitation, however, I have provided my opinions on the underlying factual determinations below.

50. Regarding the second question, “what structure is disclosed in the specification for performing the claimed function,” a POSA would have understood that the term “fluid mover” has a single function: moving fluid. A POSA would have understood that different components described in the specification of the ’425 Patent perform the function of moving fluid. For example, the wheels would cause fluid to move when rotating in the fluid reservoir, or the body of the vehicle would move fluid as it is driven through the lagoon. However, the surrounding claim language of claims 7 and 19 further requires that “at least one of the speed and direction of the vehicle is controlled by a fluid mover when the vehicle is floating.”

51. A POSA would have understood that the pump, conduit, and nozzle are the components disclosed in the ’425 Patent specification that would move fluid and would also control at least one of the speed and direction of the vehicle when the vehicle is floating.

52. Regarding the fluid pump, conduit, and nozzle assembly, the ’425 Patent describes the pump as being fluidically connected to the fluid nozzles of the vehicle via fluid conduits.

The fluid pump 9 comprises a pump housing 18 with three tangential fluid outlets 19 that are combined into a single fluid conduit 20. The single fluid conduit 20 is then split into left side 21 and right side 22 fluid conduits which connect at the front and rear of the vehicle to form a complete circuit. The fluid pump 9 is thus fluidically connected to all fluid nozzles of the vehicle via the fluid conduits 20-22.

EX1001, 5:42-48 (emphasis added).

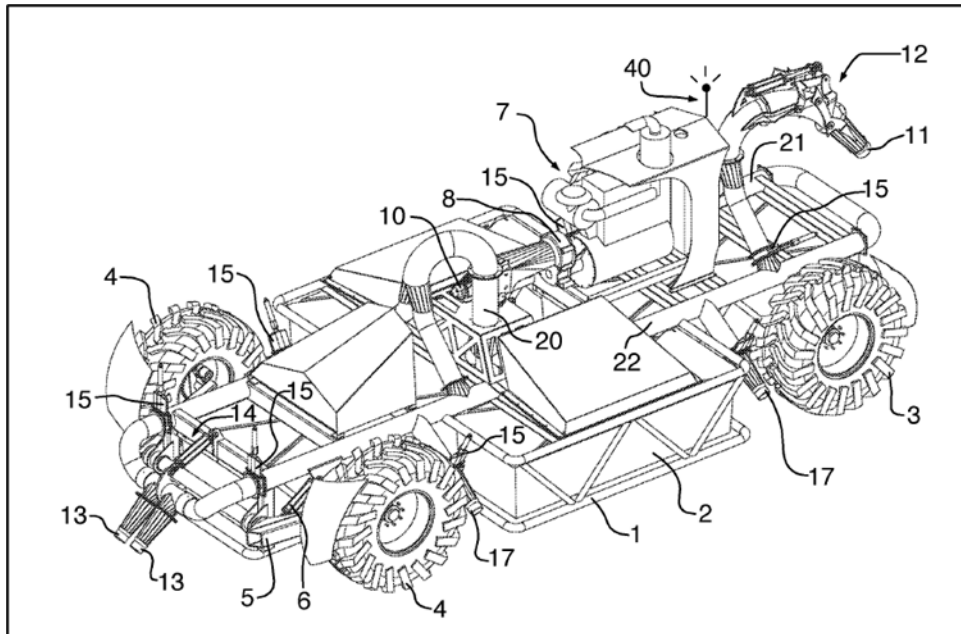
53. The '425 Patent also describes the use of the pump to drive fluid through the conduits and out of the nozzles to vary the speed and direction of the vehicle while floating.

valves 15 and the plurality of fluid nozzles is used to provide directional control and motive power for the vehicle while floating. For example, proportioning fluid flow from the right side fluid nozzles 17 to the left side fluid nozzles 16 causes the vehicle to turn to the right while floating. Similarly, fluid flow may be proportioned between the first fluid nozzle 11 and the second fluid nozzles 13 to cause the vehicle to move forward or backward. By rotating the second fluid nozzles 13 fully downwardly and then up toward the front of the vehicle using the second articulation means 14, the vehicle may also be directed rearward and/or slowed in its forward movement speed. Thus, the combination of proportioning flow between the plurality of fluid nozzles using the valve structure and/or articulating the nozzles may be used to control forward, rearward, left and right movement and speed of the vehicle. The flow rate of the fluid pump 9 may also be adjusted to enhance directional and speed control via the plurality of nozzles while floating.

EX1001, 6:1-18 (emphasis added).

54. I understand that Mr. Prairie has argued that the structure associated with the term “fluid mover” should be interpreted to mean “valve(s) and fluid nozzle(s).” EX2029, ¶¶118. This interpretation is incorrect because valve(s) and fluid nozzle(s) lack any structure that would cause a fluid to move. In contrast, a fluid pump is a structure that provides motive force to a fluid and causes a fluid to move or flow. Valves and nozzles may restrict or alter the flow generated by a pump; however they are not capable of moving liquid on their own. Therefore, a POSA would not have understood “valve(s) and fluid nozzle(s)” as the structure that performs the function of moving fluid nor have understood the term “fluid mover” to refer to valves and/or nozzles.

55. The '425 Patent identifies the valves with reference number 15 and the nozzles with reference number 11, 13, 16, and 17, which are shown in Figure 2 of the '425 Patent, below.



EX1001, FIG. 2.

56. The valve(s) and fluid nozzle(s) do not drive the movement of the fluid that is discharged through the conduits and fluid nozzles. Rather, this function is performed by a pump. *See, e.g.,* EX1001, 8:5-11 (“In operation an operator ... begin[s] pumping fluid with the fluid pump through the fluid conduits and selectively open[s] at least the second fluid nozzles to cause the vehicle to move....”). Without the pump, the valves and nozzles of the ’425 Patent would not move any fluid. Therefore, a POSA would expect the fluid mover to require some additional component (i.e. the pump) for driving the movement of the fluid. The valves and nozzles that Nuhn and Mr. Prairie attempt to associate with the term “fluid mover” lack any capacity to create fluid movement or flow. In other words,

the structures they associate with the term “fluid mover” are incapable of moving fluid by themselves.

57. Instead, as explained above, a POSA would have understood that the pump, conduit, and nozzle described in the '425 Patent would perform the function of moving the fluid and would be capable of controlling the speed and direction of the vehicle while floating. Therefore, if the term “fluid mover” is construed as a means-plus-function limitation, it is my opinion that the structures associated with the function of moving fluid would be understood by a POSA to mean a “pump, conduit, and nozzle.”

VII. GROUND 1: CLAIMS 1-21 ARE ANTICIPATED BY CARRIER

58. Carrier anticipates claims 1-21 of the '425 Patent because Carrier discloses a pump that is capable of pumping at least some forms of liquid manure, e.g., the form that contains the lowest concentration of solids, typically below 4% or 5%, exhibits characteristics and behaviors that are very similar to water, and is readily pumped by conventional water pumps. Nuhn and Mr. Prairie contend that claims 1-21 are not anticipated by Carrier. As explained herein, they are wrong.

A. Claim 1

59. Nuhn and Mr. Prairie assert that Claim 1 is not anticipated by Carrier, at least because Carrier does not: (1) disclose or suggest a fluid pump for pumping liquid manure; (2) disclose all of the wireless remote-control limitations of claim 1.

Paper 27 at 19-27; EX2029, ¶¶145-151. Nuhn and Mr. Prairie are wrong on each of these points. Carrier discloses every element of claim 1.

i. Carrier Discloses a Fluid Pump for Pumping Liquid Manure.

a. Carrier Discloses a Fluid Pump.

60. It is my opinion that the claim term “for pumping liquid manure” is a non-limiting statement of intended use. *See supra* Section VI.A. Carrier teaches an amphibious vehicle that includes a fluid pump. EX1005, ¶¶[0050]-[0051]. “The use of a pump mounted to the all-terrain vehicle which is capable of pumping water from a lake or stream onto a fire is another feature of the present invention.” *Id.*, ¶[0061]. Therefore, Carrier teaches the claim element “a fluid pump for pumping liquid manure.”

b. A POSA Would Have Understood the Carrier Pump to Have the Same Structure as Fluid Pumps for Pumping Liquid Manure.

61. Carrier describes an amphibious “forest fire” fighting vehicle including a “draft capable” “[h]igh [v]olume” pump system for pumping “from a lake or stream,” as well as “foam and or dry chemical” mixtures. *Id.*, ¶[0007], [0051], [0061]. [REDACTED]

[REDACTED] POSA would have understood that Carrier would be used in environments where the pump would need to handle fluid containing debris and other suspended solids. A POSA would also have understood

that in order to function in lakes, ponds, and rivers, and draw fluids from these bodies of water, the Carrier pump would need to handle fluids laden with stones, clay, mud, sand, muck, vegetation, and other potential debris or even biological life. If the fluid pump of Carrier were incapable of pumping fluid containing some suspended solids, it would not be capable of pumping water from lakes, ponds, or streams. EX1005, ¶¶[0060], [0063]. Therefore, a POSA would have understood that the Carrier pump necessarily pumps liquid with suspended solids.

62. Furthermore, a POSA would have understood that such a pump would be capable of pumping liquid manure, as the literature and long-time industry veterans all confirm that liquid manure has long been pumped using conventional irrigation equipment. *See* EX1040, 64; EX1042, 5; EX1054, 80; EX1114, ¶7; EX1115, ¶15.

63. POSAs would have understood that, as stated in the USDA Forest Service Wildland Fire Engine Guide, pumps used on wildland fire engines “are either centrifugal or positive displacement” and that “centrifugal pumps are usually larger ... and employed for higher volumes.” EX1113, 64. Accordingly, a POSA would have understood that the high-volume pump systems disclosed in Carrier would comprise a centrifugal pump or a positive displacement pump.

64. [REDACTED]

[REDACTED]

████████████████████ These centrifugal pumps are specifically described as being used to pump liquid manure. *Id.*; EX1029, 1:8-10.

65. A POSA would have also understood that centrifugal and positive displacement pumps have long been used to pump liquid manure. EX1040, 51-52; EX1054, 76-80; EX1066, 42-46. A POSA would have also understood that these pumps can be scaled up or down in size to pump higher or lower volume flow rates. *See* EX1124, 4-5. For example, a pump manufacturer may offer the same pump design over a wide range of sizes and capacities. *Id.* A POSA would have generally understood that larger pumps are capable of generating greater flow rates and would have larger fluid passageways than smaller pumps, and accordingly would be capable of passing larger solids through them. *Id.* POSAs would have therefore understood Carrier's pump to be capable of pumping suspended solids in dilute forms of liquid manure, which are generally in the 1-6mm range (EX1004, Section V.B.ii.b (citing EX1043, 9))—much smaller than the larger solids capable of being pumped by these centrifugal and positive displacement pumps.

████████████████████
████████████████████

c. The Carrier Pump at Least Pumps Dilute Forms of “Liquid Manure.”

66. Nuhn concedes that its construction of “liquid manure” includes mixtures of water and animal waste having total solid contents of less than about 5%. Paper 27 at 15-16. [REDACTED]

[REDACTED]. A POSA would have understood that even Mr. Prairie’s unlimited range of solids concentration in liquid manure would have included liquid manures with approximately 4-5% total solids or less.

67. As explained above, a POSA would have understood that liquid manure contains the lowest solids content of the various forms of manure, and a POSA would have understood that manure lagoons typically contain a relatively low solids content, which is why they are described as “liquid” based on their solids content and the physical characteristics which they exhibit. *Supra* Section VI.A.ii-iii. A POSA would have therefore understood that the Carrier “[h]igh [v]olume” firefighting pump, which is capable of pumping liquid from “lake[s] or stream[s],” would have at least been capable of pumping dilute forms of liquid manure. EX1005, ¶[0051], [0061]. A POSA would have understood that dilute forms of manure were pumped with conventional water pumps, including pumps used for irrigation. EX1040, 64; EX1041, 5; EX1054, 80, 84-85. A POSA would have understood that

these water irrigation pumps would be capable of pumping liquid manures containing suspended solids, as would the high-volume water pump of Carrier.

68. Nuhn and Mr. Prairie have not demonstrated or even attempted to demonstrate why the pump of Carrier would not be capable of at least pumping dilute forms of liquid manure with approximately 4-5% or less total solids.

d. Nuhn's Counterarguments Are Wrong.

69. Mr. Prairie cites to the '425 Patent and to Houle (EX2010) to suggest that liquid with solid particles in suspension tends to clog "traditional pumps." EX2029, ¶147. The cited section of the '425 Patent is related to the purported benefits of an immersion pump which obviates the need for priming, but it does not support his position that "traditional pumps" would be incapable of pumping liquid manure. Mr. Prairie misrepresents the disclosure of the '425 Patent.

70. Mr. Prairie also refers to the Depeault patent and cites to the potential for crusts to form six feet thick. *Id.*, ¶148 (citing EX2003). This argument is irrelevant. Fluid pumps, including Nuhn's pump disclosed in the incorporated-by-reference '758 Patent (EX1029), are not designed to pump, and are not capable of pumping, solid objects six feet in dimension. A POSA would have understood that a fluid pump for pumping liquid manure would not be capable of, or would be not required to, pump hard, solid materials six feet in dimension. Mr. Prairie's continued reliance on a potential six-foot-thick crust is irrelevant, misleading, and has nothing

to do with the requirements or capabilities of a fluid pump for pumping liquid manure at issue in the '425 Patent.

71. Mr. Prairie contends that a POSA “would also expect Carrier’s water pump to have clogging problems if used to pump liquid manure because Carrier discloses a screen for filtering debris that would otherwise clog hoses or the pump.” EX2029, ¶149. This is incorrect because screens were known in the art and were used in liquid manure pumping applications. EX1004, ¶¶105-113. Mr. Prairie’s conclusions are speculative and contrary to the understanding of a POSA. Specifically, a POSA would have understood that screens are used in many pumping applications, including liquid manure, and allow solids under a certain size to pass through and be processed by the pump while preventing larger solids above a certain size from entering. This same approach was known in the art for pumping liquid manure. *Id.* Contrary to Mr. Prairie’s assertions, the screen would not render the high-volume fluid pump of Carrier incapable of pumping liquid manure. Even under Mr. Prairie’s overly broad construction of liquid manure, which would include trees, solid objects six-feet-thick, and objects containing no liquid at all, Carrier would have at least been capable of pumping those forms of liquid manure containing 4-5% solids or less.

ii. The Wireless Remote Control Limitations of Claim 1.

72. Mr. Prairie contends that Carrier does not describe the wireless remote-control functionality of Claim 1. EX2029, ¶150. He asserts that Carrier fails to teach wireless remote control of “a flow of liquid manure from the fluid pump[,]” based on his contention that Carrier does not disclose a pump that pumps liquid manure. As explained above, this conclusion is wrong. Carrier would be capable of pumping liquid manure, e.g., “liquid with some suspended solids.” *Supra* Section VII.A.i.

73. Mr. Prairie further asserts that Carrier does not expressly describe remotely controlling speed and/or direction when the vehicle is floating. EX2029, ¶150. This is inaccurate and does not reflect what a POSA would have understood from the teachings of Carrier. As explained below, a POSA would have understood that the amphibious vehicle disclosed in Carrier is capable of controlling its speed and direction while floating. Mr. Prairie also applies the wrong standard. I understand that anticipation does not require that the prior art “expressly describe” the claimed feature, as Mr. Prairie asserts. Rather, I understand that anticipation is established when a POSA would reasonably understand or infer from the prior art reference’s teaching that every claim was disclosed.

74. Carrier explicitly describes control of the vehicle’s speed and direction while the vehicle is floating. Carrier teaches that the amphibious vehicle includes a “hull” that “can preferably be shaped in such a configuration as that of a boat in a

slight curved V shape....” EX1005, ¶[0079]. A POSA would have understood that the hull described in Carrier is a feature of a floating watercraft designed to be driven on water. Carrier describes that the hull can facilitate amphibious operations, including: “(1) eliminating water drag on the vehicle as it moves through the water, (2) water build up distribution in front of and to the sides of the vehicle 100 (which slows the movement and turning capabilities of the vehicle 100), (3) significantly enhances both the movement directional speed i.e. forward or reverse and significantly enhances the turning capabilities left or right as well of vehicle [sic] 100.” *Id.*, ¶[0079]. A POSA would have understood from the plain language of Carrier that “forward or reverse” would involve controlling the speed of the vehicle, and that “turning capabilities left or right” would involve controlling the direction of the vehicle. The very same function described in the claim language of the ’425 Patent. However, Mr. Prairie completely ignores these teachings in their entirety.

75. Carrier teaches that the vehicle can be operated remotely, including controlling the speed and/or direction of the vehicle while it is floating. Carrier teaches that “the vehicle 100 via radio, satellite, cell... can be placed into remote control operation to continue the mission ... by a second or more party remote from the vehicle 100.” EX1005, ¶[0065]. Carrier also teaches that the remote control enables “vehicle 100 to be remotely controlled via line of sight, gps, or by air via aircraft such as the so-called ‘Preditor [sic].’” EX1005, ¶[0064].

76. A POSA would have also understood that the speed and/or direction of the Carrier vehicle would be controlled remotely while the vehicle is floating because Carrier teaches an amphibious vehicle. EX1005, ¶¶[0003], [0079]. A POSA would have understood that amphibious vehicles are designed and intended to be driven on both ground and on water. *Id.*, ¶[0005]. Implicit in the use of the term amphibious vehicle is the fact that the speed and/or direction of the vehicle is able to be controlled on both land and water. A POSA would have understood from the term “amphibious vehicle” alone that the vehicle of Carrier was drivable on water and that the speed and/or direction of the vehicle could be controlled while floating. Notably, Mr. Prairie does not provide a single example of an amphibious vehicle where the speed and/or direction of the vehicle cannot be controlled while the vehicle is floating, to support his position. EX2029, ¶150.

77. In sum, Mr. Prairie’s assertions that the speed and/or direction of the amphibious vehicle of Carrier cannot be controlled remotely while the vehicle is floating are without basis and are belied by the explicit teachings of Carrier and by a POSA’s general understanding of amphibious vehicles and their functions. A POSA would have understood that the speed and/or direction of the Carrier vehicle could be controlled by remote control while the vehicle is floating, anticipating claim 1 of the ’425 Patent.

B. Claims 7 and 19

[7] The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

[19] The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

78. Carrier discloses a pump, conduit, and nozzles. As described below, a POSA would have understood that these components would be capable of controlling speed and direction of the vehicle while floating.

79. Mr. Prairie alleges that Carrier's water cannon could not control the speed and direction of the vehicle while floating. EX2029, ¶¶158-160. Mr. Prairie disregards basic principles of physics and offers opinions contrary to what a POSA would have understood.

80. A POSA would have understood that the Carrier vehicle could be propelled while floating and a POSA would have further understood that propulsion would be accomplished by moving fluids. Carrier teaches that "propulsion pumps ... can preferably be operatively connected to the chassis 102 and or chassis 104." EX1005, ¶[0049]. A POSA would have understood that propulsion pumps are used to control the speed and direction of a floating vehicle by accelerating fluid. A POSA would have also understood that the firefighting pump systems of Carrier can provide various pressure and volume outputs, including "High Pressure/High Volume." *Id.*, ¶[0051]. A POSA would have understood that such pump systems

providing high pressure and high volumes of fluid flow disclosed in Carrier would produce reaction forces that would propel a floating vehicle.

81. Mr. Prairie suggests that Carrier's pump and water cannon are not powerful enough to overcome drag to propel or maneuver the Carrier vehicle while it is in water. EX2029, ¶158. Mr. Prairie is wrong. Carrier discloses that the vehicle and its pump systems may be powered by an engine "such as 166 horse power (124 KW) @3500 RPM FPT (Fiat Power Train) diesel engine." EX1005, ¶[0039]. Carrier also discloses that power may be supplied "using variable fuel sources such as electrical, LP gases, gasoline, diesel, bio chemical and even nuclear fuels etc." *Id.*, ¶[0007]. Mr. Prairie's suggestion that Carrier's pump and water cannon might not be "powerful enough" is without basis and ignores the fact that the Carrier vehicle includes an engine that can be at least 166 horsepower. A POSA would have understood that a 166 horsepower engine coupled to a high pressure-high volume pumping system would be capable of generating considerable flow and thrust, certainly enough to propel the Carrier vehicle.

82. A POSA would have understood that this type of engine could propel a 40- or 50-foot-long vessel at speeds of several knots. Diesel engines in the 150-200 horsepower range are found in many trawler vessels, which a POSA would have understood are capable of being propelled at several knots by these engines.

EX1132. Mr. Prairie's suggestions disregard basic physics, basic engineering principles a POSA would have understood, and common sense.

83. A POSA (a mechanical engineer), as described above (*Supra* Section V), would possess an understanding of basic physics, including concepts like conservation of momentum and the reaction forces generated when accelerating fluids using nozzles.

84. A POSA would also be aware of marine propulsion systems and methods for propelling amphibious vehicles while floating. A POSA would have been aware that using pumps to move fluid while floating is a known method for propelling marine vehicles. A POSA would have understood that doing so would create reaction forces that will cause the floating vehicle to move.

85. For example, Cheramie is a prior art patent which describes the use of an amphibious vehicle's fluid pump-based propulsion using a water pump connected to a "directable discharge." EX1087, 2:60-3:17, A POSA would have understood that this is the same form of propulsion that would be accomplished using the Carrier vehicle pump, conduit, and nozzle.

86. While Nuhn argues that this type of propulsion would render the vehicle incapable of remaining stationary and fighting fires (Paper 27 at 27-28), Nuhn's argument is irrelevant as to whether Carrier meets the claim limitations, which it does, and also ignores that the vehicle includes a propulsion pump that could be used

to offset any undesirable propulsion effect from the firefighting pumps and nozzles when fighting fires. EX1005, ¶[0049].

87. Furthermore, it is my opinion that even under Nuhn’s construction of “fluid mover,” Carrier still anticipates claims 7 and 19. Carrier discloses a “valve flow system” for controlling the operation of the firefighting system. EX1005, ¶[0051]. A POSA would have understood that the valve flow system used in the firefighting equipment disclosed by Carrier would regulate the flow from different pumps to provide the “cross over capabilities” and alternatively allow for water pumping or “hazardous material decontamination operations by merely the flip of an electronic switch and or a manual over-ride to the valve flow system.” *Id.*, ¶[0051]. A POSA would have understood that the combination of the valve flow system and nozzles would thereby allow for controlling the speed and direction of the vehicle while floating.

C. Claims 8-11 and 20-21

[8] The vehicle of claim 1, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

[9] The vehicle of claim 8, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

[10] The vehicle of claim 4, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

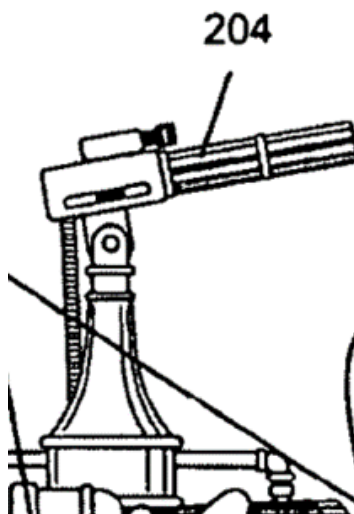
[11] The vehicle of claim 10, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

[20] The vehicle of claim 17, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

[21] The vehicle of claim 20, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

88. I understand that Nuhn argues that claims 8-11 and 20-21 are not anticipated by Carrier because Nuhn alleges that Carrier does not disclose a plurality of fluid nozzles. Paper 27 at 28-30. I understand that Mr. Prairie does not offer the same reasons for his opinions regarding claims 8-11 and 20-21.

89. Nuhn's arguments regarding the number of nozzles disclosed by Carrier are incorrect. Carrier states that the "fire-fighting equipment 200 include[es] ... **nozzles 204.**" EX1005, ¶[0050] (emphasis added).



Id., FIG. 1.

90. I understand that Nuhn argues that the nozzles described in Carrier do not anticipate the claims because, according to Nuhn, they only produce a single jet of fluid that is “discharged at single direction and flowrate.” Paper 27 at 29. However, I understand that none of claims 8-11 or 20-21 require that the nozzles produce a plurality of jets of fluid or that they discharge in multiple directions and/or flowrates. Therefore, it is my opinion that claims 8-11 and 20-21 are anticipated regardless of the number of jets that are produced by the multiple Carrier nozzles.

91. Mr. Prairie initially asserts that Claims 9 and 11 are not anticipated by Carrier at least because of their dependence on Claims 1 and 8. EX2029, ¶¶167-168, 170.

92. Mr. Prairie does not dispute that Carrier includes a plurality of nozzles as part of the firefighting equipment nor does Mr. Prairie dispute that the orientation of the firefighting equipment of Carrier is remotely controlled. Rather, Mr. Prairie’s arguments appear to be based solely on the ability of the firefighting equipment to control the speed and/or direction of the vehicle. *Id.* However, as explained above, a POSA would have been familiar with the various methods used for propelling amphibious vehicles while floating and would have understood that discharging a jet of fluid from a high-volume/high-pressure pump system will produce a reaction force that will propel a floating vehicle. *Supra* Section VII.B.

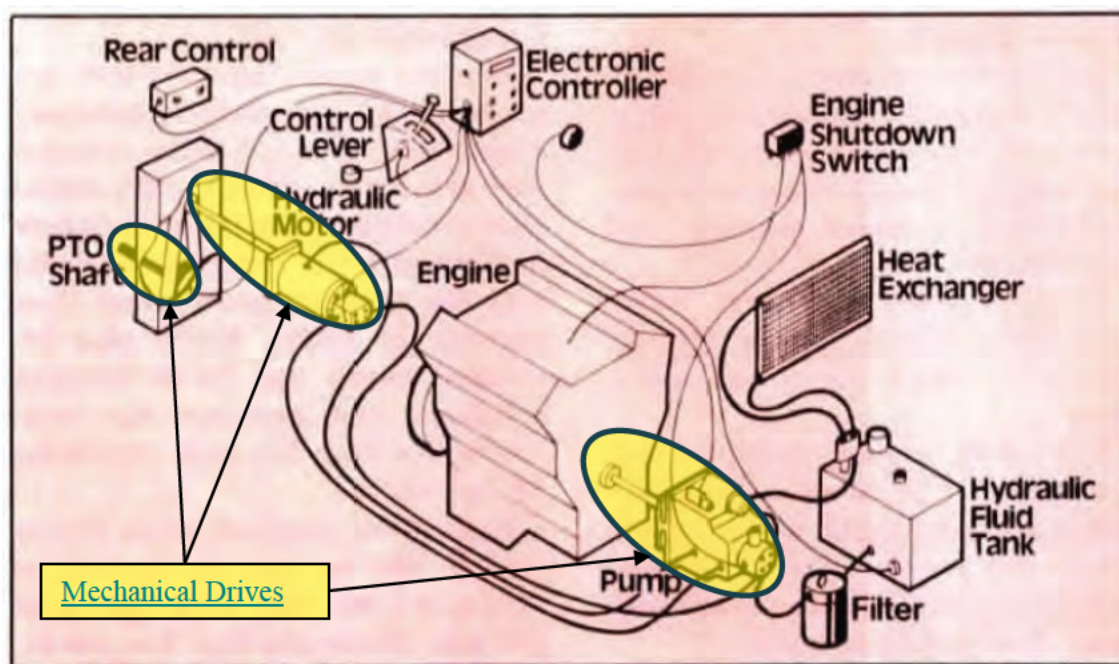
D. Claim 12

[12] The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive.

93. Mr. Prairie suggests that a hydrostatic PTO includes a hydraulic connection and not a mechanical connection. EX2029, ¶¶171-173. Therefore, Mr. Prairie incorrectly concludes that Carrier does not describe a power source connected to the hydraulic pump by a mechanical drive and the fluid pump by a mechanical drive. *Id.*

94. Mr. Prairie references a 1977 magazine article entitled “Hydrostatic Pto’s Run in Reverse.” *Id.* Mr. Prairie suggests that power transmission systems that utilize fluid or hydraulics for power transmission are no longer a mechanical system or a mechanical drive. This is wrong. Mr. Prairie provides no evidence to support his view that a power transmission system that utilizes fluid or hydraulics for power transmission is no longer a mechanical system or a mechanical drive. Rather, hydraulic power systems use mechanical forces produced by the flow of pressurized fluid to create movement of the mechanism they are supplying. EX1123, 4. Such hydraulic power transmissions would therefore properly be understood to be a “mechanical drive.” *See id.* (referring to hydraulic systems as arrangements of “hydro-mechanical elements”).

95. Furthermore, even if a hydraulic power transmission is determined to be something other than a “mechanical drive,” systems using a hydraulic power transmission necessarily include one or more “mechanical drives.” Mr. Prairie’s referenced magazine article demonstrates that his example of a hydrostatic PTO, such as the one described in Carrier, *would* include multiple mechanical drives. In the diagram relied on by Mr. Prairie (EX2029, ¶172), and illustrated below, a POSA would have recognized that at least the output shaft from the engine to the pump, the output shaft from the hydraulic motor, and the PTO shaft to be mechanical drives.



EX2029, ¶172 (annotated).

96. Specifically, this figure depicts a drive shaft extending between the engine and the hydraulic pump. The figure further depicts a drive shaft extending

between a hydraulic motor and a gear, which is connected to a PTO shaft by belt and another gear coupled to the PTO shaft. As described by Carrier, the fluid pump is powered by such a PTO shaft. EX1005, ¶[0051]. A POSA would have understood each of these components described in the figure to be a mechanical drive.

97. I understand that claim 12 depends from claim 1, which uses the transitional phrase “comprising.” I understand that this transitional phrase signifies that the claim may include additional components other than those listed in the claim. Therefore, even if a hydrostatic PTO, in its entirety, is not purely a “mechanical drive,” it is my opinion that, because the hydrostatic PTO of Carrier includes several “mechanical drives,” in addition to hydraulics, that comprise the connection between the power source and the fluid pump, Carrier discloses a fluid pump connected to the power source by a “mechanical drive” and anticipates claim 12.

E. Claims 2-6, 8, and 13-18

[2] The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump.

[3] The vehicle of claim 2, wherein the conduit comprises an opening at the end thereof.

[4] The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening.

[5] The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit.

[6] The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit.

[13] The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed.

[14] The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels.

[15] The vehicle of claim 14, wherein the set of wheels comprises at least two powered wheels.

[16] The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed.

[17] The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor.

[18] The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit.

98. Claims 2-6 and 13-18 each depend from claim 1. I understand that neither Nuhn nor Mr. Prairie provide any analysis or opinion regarding these claims and anticipation by Carrier, aside from referring back to previous claims from which they depend.

99. As discussed in my prior declaration, it is my opinion that claims 2-6 and 13-18 are anticipated by Carrier. EX1004, Sections VII.B-D and VII.K-O.

VIII. GROUND 2: CLAIMS 1-7 AND 12-19 ARE RENDERED OBVIOUS BY TRUXOR IN VIEW OF YOON OR CARRIER

100. Claims 1-7 and 12-19 of the '425 Patent are rendered obvious by Truxor in view of Yoon or Carrier. Truxor teaches every limitation of these claims with the exception of the remote-control features, which were well known to a POSA. Further, POSAs would have been motivated to add remote control features to Truxor to improve its overall safety and expand its ability to operate in dangerous environments, and would have a high probability of success in doing so. EX1004, Section VIII.A. As described herein, Nuhn's and Mr. Prairie's conclusions that Truxor combined with Yoon or Carrier would not render claims 1-7 and 12-19 obvious are wrong.

A. Motivation to Combine

101. As described in my prior declaration, the motivations to combine Truxor with Yoon or Carrier are substantially similar to the motivations to combine SenwaTec with Yoon or Carrier. EX1004, Section IX.A. Because Mr. Prairie does not provide any separate analysis regarding the motivations to combine Truxor and SenwaTec with Yoon or Carrier, I address both of these references below.

102. I understand that Nuhn does not provide any argument in its Response that a POSA would have lacked a motivation to combine, or a reasonable expectation of success in combining Truxor with Yoon or Carrier. 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 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.

103. Mr. Prairie's suggestion that there would have been no motivation to combine Truxor with Yoon or Carrier (*see* EX2029, ¶¶137-141) 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) are not able to withstand corrosion, (4) would not provide a remote operator with a line of sight, and (5) have hydraulic controls that could not be remotely controlled. Each of these arguments are demonstrably wrong and counter to the evidence.

104. First, contrary to Mr. Prairie's assertions, a POSA would have understood that the pumps of Truxor and SenwaTec are capable of pumping and agitating liquid manure. A POSA considering the teachings of Truxor and SenwaTec would have understood that both vehicles and their pumps 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, a POSA would have equally understood that these are not limitations of the '425 Patent claims, and breaking up “crust” is not a requirement for a fluid pump to pump liquid manure.

105. Mr. Prairie implies that the pumps of Truxor and SenwaTec would not be sufficiently powerful for pumping liquid manure. However, as describe below, dredging pumps such as the pumps of Truxor and SenwaTec have long been used to pump liquid manure and suspended solids. *Infra* Sections VIII.B.i and IX.B.i. 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.

106. 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 '425 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 '425 Patent claims. A POSA would have understood that the Truxor vehicle weighs approximately 1,380 kg (3042 lb.) (EX1006, 3) and that the SenwaTec vehicle weighs approximately 2480 kg (5500 lb.) (EX1012, 1). A POSA would have understood that a crust may not even be present, [REDACTED]

[REDACTED]. 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 [REDACTED]

107. Third, Mr. Prairie asserts that liquid manure in a manure lagoon is highly corrosive and because of that, a POSA would not have been motivated to use an amphibious vehicle in a liquid manure lagoon. EX2029, ¶141. However, Mr. Prairie is incorrect because a POSA would have understood that marine vehicles, specifically amphibious vehicles, can and do operate in corrosive environments, including salt water. For example, Truxor describes the use of “salt water-durable aluminum” and “[h]eat galvanized steel[.]” EX1006, 3. SenwaTec also describes “[r]obust marine aluminum construction.” EX1012, 3. A POSA would have been

familiar with corrosive environments and would have been familiar with various techniques for eliminating, or at a minimum mitigating, the effects of corrosion. A POSA would have understood that corrosion-resistant materials were known in the art and readily available for mitigating any such negative effects.

108. Fourth, 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 around the vehicle. EX2029, ¶142. 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. 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 (EX1081), 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.



EX1081, 5:09 (annotated).

109. Mr. Prairie offers no analysis to support his 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.

110. Fifth, Mr. Prairie alleges that the hydraulic controls of Truxor and SenwaTec would be difficult to implement remote control over. EX2004, ¶131. To the extent these difficulties exist, a POSA would have understood that they could be readily overcome. 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. EX1014, ¶¶[0026], [0064]. In addition, the '425 Patent shows that the use of remote control with hydraulic systems is not as difficult as Mr. Prairie asserts. The '425 Patent provides little or no information related to the structure and configuration of the remote control system, presumably due to its ease of implementation.

111. 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 12 at 20 (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.” Paper 12 at 20-21 (emphasis added).

112. As explained previously (EX1004, ¶¶255-262), 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.

B. Claim 1

[1.0] An amphibious vehicle comprising:

[1.1] a floatable vehicle body;

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

[1.3] a fluid pump for pumping liquid manure;

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

[1.5] a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion structure; (2) control a flow of liquid manure from the fluid pump; (3) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (4) control at least one of the speed and direction of the vehicle when the vehicle is floating.

i. Truxor Discloses a Fluid Pump for Pumping Liquid Manure.

113. Nuhn and Mr. Prairie allege that the Truxor Doro Pump is not a fluid pump for pumping liquid manure and would clog in liquid manure pumping applications. EX2029, ¶¶184-187. This is incorrect because Truxor clearly teaches that the Doro Pump is capable of pumping liquid containing suspended solids.

114. The capabilities disclosed by Truxor would have clearly demonstrated to a POSA that the Doro Pump was capable of pumping liquid manure. For example, Truxor teaches that the Doro Pump is capable of “dredging hard sediments,” including “sediment containing solid objects, e.g. stones, bits of wood, etc.” EX1006, 10. Truxor also discloses that the “wheel feeder has a rotating wheel with horizontal cutters and vertical teeth which aerate the sediment and cut off roots to facilitate the feeding into the inlet of the pump.” EX1006, 10.



EX1006, 10.

115. A POSA would have understood from the plain language and the images provided in Truxor that the Doro Pump was capable of pumping liquids and sediments containing hard objects, including stones, roots, bits of wood, etc. A POSA would have understood that with these capabilities, the Doro Pump would be

more than capable of pumping liquid manure, which I understand the PTAB has construed as “liquid with suspended solids.” Paper 12 at 12.

116. A POSA would have understood that dredge pumps, like the Doro Pump, are capable of pumping liquids containing suspended solids. In fact, that is the primary application of dredge pumps, like the Doro Pump, to transport solid materials in liquid environments and to move large volumes of liquids and solids. *See, e.g., The Dredge Pump*, ELLICOTT DREDGES, <https://www.dredge.com/the-dredge-pump/> (last visited Aug. 05, 2024). Furthermore, the Doro Pump specifically describes that the pump includes “screw feeding” for pumping sediment containing “stones, bits of wood, etc.” EX1006, 10.

117. I understand that Nuhn argues that because the Doro Pump uses a suction nozzle, wheel feed, or screw feed, to crush solids, it would not pump liquid manure. Paper 27 at 47-48. However, Nuhn ignores that when in a liquid manure lagoon, even if suspended solids were “crushed” by the Doro Pump’s wheel feed or screw feed, they would still be suspended in the liquid manure, and the Doro pump would be capable of processing and pumping them, just as it is capable of pumping “stones, bits of wood, etc.” It is my opinion that a POSA would have understood that the Doro Pump’s ability to “crush” solid objects with its wheel and screw feed systems, and its ability to process solid materials through its pump, would facilitate the pumping of liquid manure, rather than prevent it as Nuhn suggests.

118. Mr. Prairie contends that I did not conduct analysis of the characteristics of the Doro pump in comparison to other manure pumps. EX2029, ¶188. Such details are unnecessary because a POSA would have understood that the Doro Pump is a dredge pump. A POSA would have understood that the primary function of a dredge 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, 41-42, 54-58; EX1054, 38, 76-77; EX1066, 42-46, 104; EX1085, 1; EX1086, 3.

119. Further, the pumping capacity and engine power are specified within Truxor. Inconsistent with his own criticisms, Mr. Prairie does not provide any reference as to specific tolerances, pumping heads, capacities, powers, or any other pump characteristic that would be required for pumping liquid manure. [REDACTED]

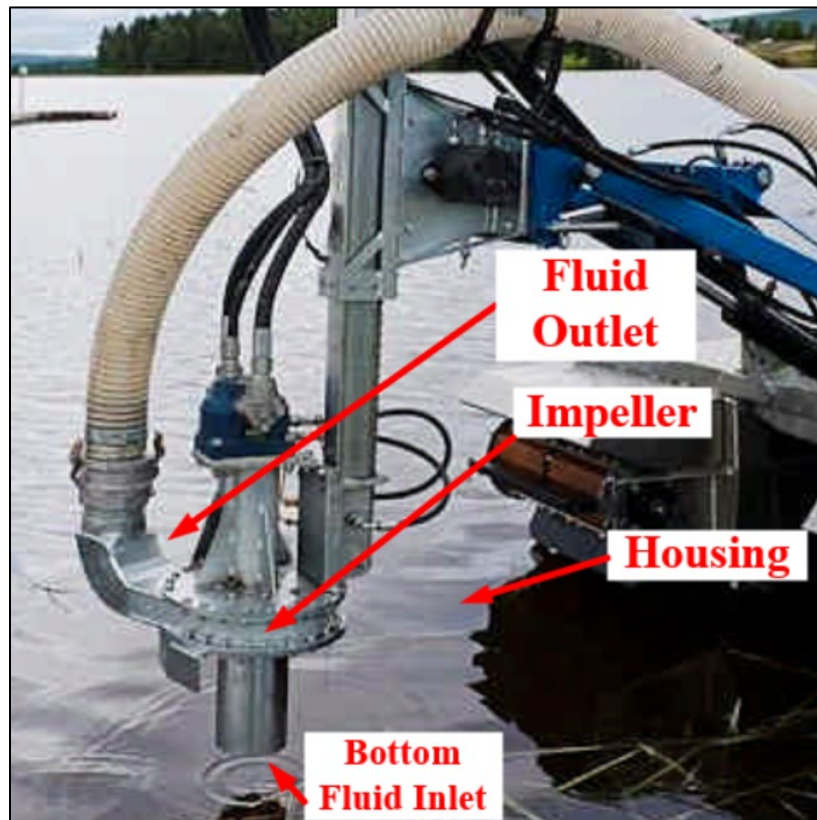
[REDACTED]

[REDACTED]

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

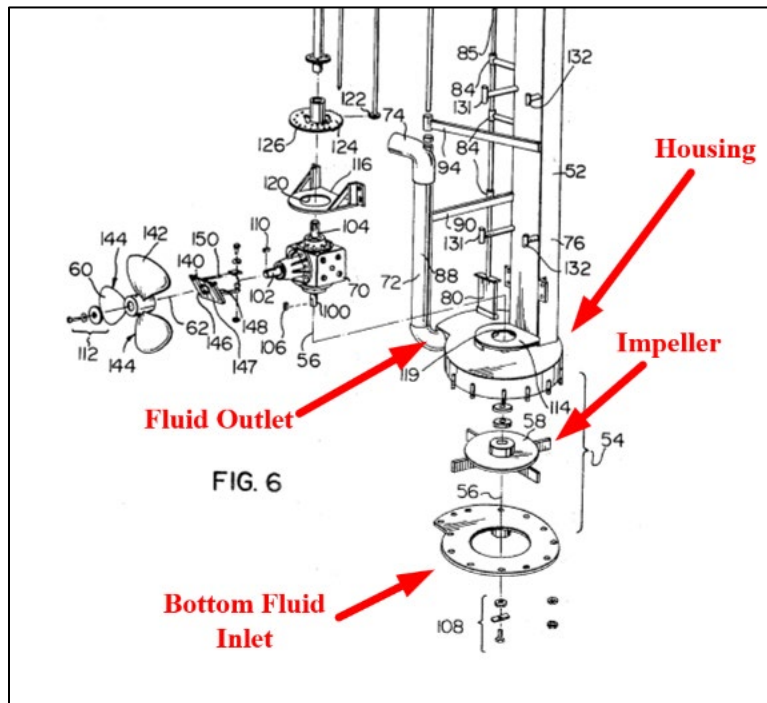
120. A POSA would have also understood that the Doro Pump is a centrifugal pump based on its geometry. A POSA would have understood that such centrifugal pumps include a spinning impeller inside a housing. A POSA would have understood that the Doro Pump includes a bottom fluid inlet that draws fluid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

121. 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.



EX1006, 10 (annotated).

122. As shown below, POSA would have also understood that each of the above-identified structural features of the Doro Pump are the same features that are described in Houle, which describes a centrifugal pump for pumping slurry manure. EX2010. These structural features are not required, nor are they the only pump configuration known in the art for pumping liquid manure. However, a POSA would have understood from the teachings of Truxor and these common structural features that the Doro Pump, like the Houle pump, could pump liquid manure.



EX2010, FIG. 6 (annotated).

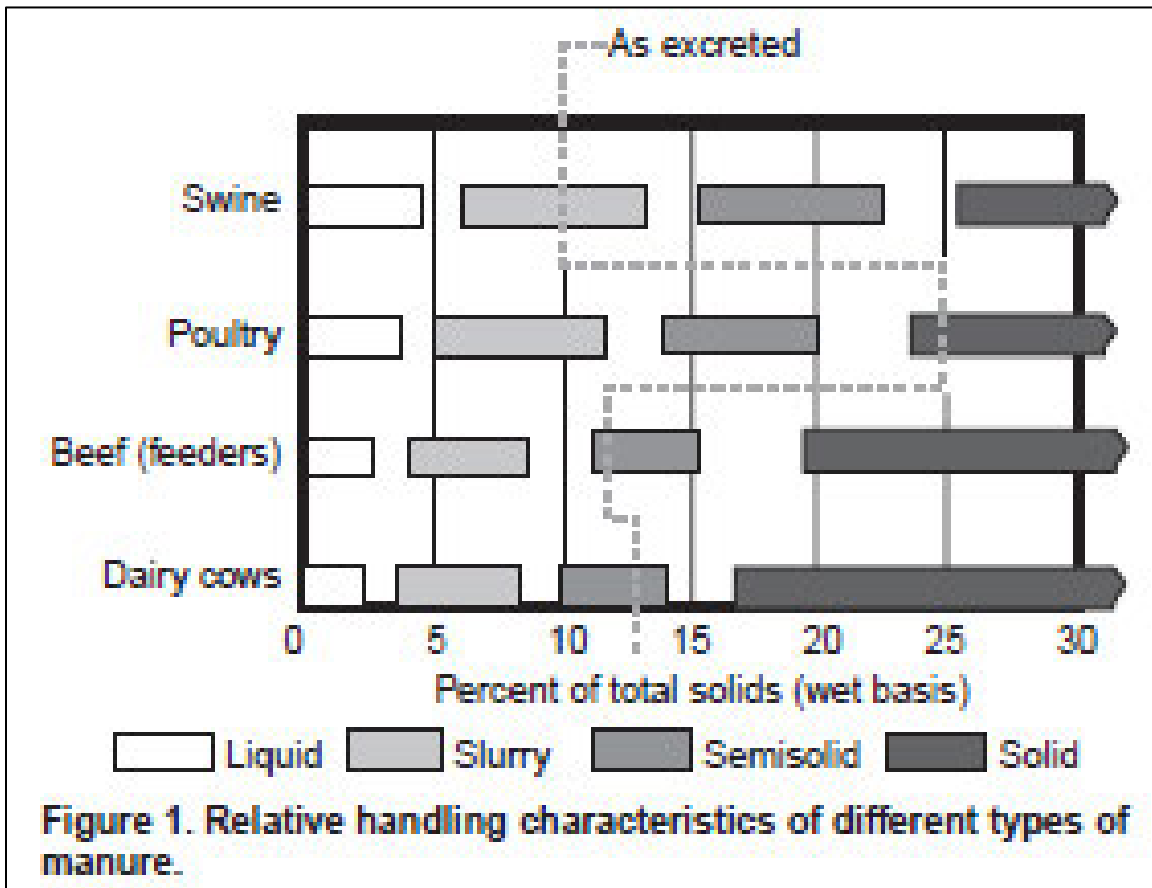
123. Mr. Prairie cites Houle, suggesting that centrifugal pumps are prone to clogging when used to pump manure (notably, choosing to refer to “manure” rather than “liquid manure,” as if they are one and the same). Mr. Prairie cites a portion of Houle that explains that centrifugal pumps are less efficient when used to pump heavy bottom sediments. EX2029, ¶244. Mr. Prairie’s arguments fail on multiple levels. First, pumping and transporting heavy bottom sediments like sand, silt, mud, stones, bits of wood, etc. is precisely the design intent of dredge pumps like the Doro Pump—and is explicitly described by Truxor. EX1006, 10. Second, Mr. Prairie’s reliance on this quote from Houle generically referring to centrifugal pumps is nonsensical, as Houle, the ’425 Patent, and the ’758 Patent all disclose centrifugal pumps

that are used for pumping manure.² Mr. Prairie provides no basis to suggest that this quotation from Houle is directed specifically to centrifugal dredge pumps, like the Doro Pump, but somehow does not apply to centrifugal pumps of Houle, the '425 Patent, or the '758 Patent. A POSA would have understood the basic function, application, and capabilities of a centrifugal dredge pump, including the Doro Pump of Truxor, and therefore would have understood such a pump to be capable of pumping liquid manure. A POSA would not look to Houle to determine whether the Doro Pump of Truxor would be capable of pumping liquid manure, and even if one did, they would not conclude from Houle that the Doro Pump could not pump liquid manure, as Mr. Prairie suggests. Looking to Houle, a POSA would have recognized the similarities between the centrifugal manure slurry pump of Houle and the Doro Pump of Truxor, and concluded that Truxor would be more than capable of pumping liquid manure.

² It is noted that the pump of the '758 Patent, incorporated by reference with the '425 Patent [REDACTED]

[REDACTED] is also a centrifugal pump [REDACTED] and Mr. Prairie's broad conclusory statements from Houle would equally apply to that pump.

124. Mr. Prairie also asserts, without support, that liquid manure has high total solids content and behaves like a non-Newtonian fluid. EX2029, ¶189. Mr. Prairie suggests that Truxor (EX1006) would not pump thick crusts on a liquid manure lagoon. EX2029, ¶187. Mr. Prairie, again, incorrectly substitutes solids for liquids and equates “crust” to “liquid manure.” Mr. Prairie offers the broad conclusions, which are demonstrably false, that liquid manure has “high total solids content” and “behaves like a non-Newtonian fluid.” There is considerable evidence to the contrary, and this 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 baselessly asserts. EX1041, 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; EX1054, 76; EX1040, 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). EX1062, 13.



EX1041, 2.

125. A POSA would have understood that some higher concentrations of manure exhibit non-Newtonian behaviors, specifically shear-thinning characteristics. *See, e.g.,* EX2033, 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.” EX1128, 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. EX1054, 76; EX1121, 5.

126. Regardless, Mr. Prairie has 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. 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. EX1040, 52.

127. 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. EX1128, 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 seems to assert. *Id.* Furthermore, a POSA would have understood that “sand-laden manure ... approaches Newtonian fluid when concentration decreases....”

EX1129, 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).

128. 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, “Liquid manures with less than approximately 4% total solids can be pumped from earthen basins or lagoons using pumps designed for conventional water irrigation.” EX1040, 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.

129. 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.

ii. The Combination of Truxor and Yoon or Carrier Discloses the Remote-Control Limitations of Claim 1.

130. As noted by Nuhn in its Response, as of the filing date of the '425 Patent, “generally remote control was known.” Paper 27 at 47. Nevertheless, Nuhn and Mr. Prairie assert that the Truxor combination fails to disclose all of the wireless remote control limitations of Claim 1. EX2029, ¶191. Nuhn and Mr. Prairie contend that because Truxor does not disclose a pump that pumps liquid manure, the Truxor combination also fails to teach wireless remote control of “a flow of liquid manure from the fluid pump.” *Id.*, ¶191. Nuhn and Mr. Prairie are wrong.

131. Neither Nuhn nor Mr. Prairie provide any analysis and do not offer any arguments that the remote-control system of Yoon or Carrier would not function to control the flow of liquid manure from the Doro Pump of Truxor. Rather, Nuhn and Mr. Prairie base their arguments around the notion that the Doro Pump, a dredge pump, disclosed in Truxor would be incapable of pumping liquid manure. As explained above, a POSA would have understood that the Doro Pump was capable of pumping liquid manure. *Supra* Section VIII.B.i. Also explained above, a POSA would have been motivated to add remote control to the Truxor vehicle and would have had a reasonable expectation of success. *Supra* Section VIII.A.

iii. Truxor Discloses the Claimed Combination of Elements.

132. Mr. Prairie asserts that the claims of the '425 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. EX2029, ¶¶192-193. Mr. Prairie's statement is contrary to the express language of the '425 Patent claims. Specifically, claims 1-21 of the '425 Patent do not provide any reference to "crust" or to the function of "disrupting the crust."

133. In an effort to support this position, Mr. Prairie states that because Truxor describes various other capabilities in addition to dredging, it would not serve as an amphibious manure lagoon pumping/agitation vehicle. *Id.*, ¶¶250-252. Mr. Prairie's analysis focuses on other capabilities of Truxor, like reed cutting and gathering, while summarily ignoring the function, purpose, and capabilities of dredge pumps, like 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. *Supra* Section VIII.A.i.

iv. A POSA Would Have Had a Reasonable Expectation of Success in Combining Truxor with Yoon or Carrier.

134. Separate from his discussion of the motivation to combine Truxor or SenwaTec with Yoon or Carrier, which is refuted above, 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. EX2029, ¶¶197-199. However, Mr. Prairie is wrong because regardless of his concerns regarding tactile feedback that an operator would experience onboard the vehicle, 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.

135. Mr. Prairie relies on EX2025 to support his opinion that hydraulic excavator controls are not easily converted to teleoperation. EX2029, ¶199. This argument is irrelevant. The '425 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.

136. 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. EX2029, ¶199. 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. *Id.*, ¶214. 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.

137. 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. [REDACTED]

[REDACTED]. Mr. Nuhn’s testimony illustrates the ease with which remote control systems can be adapted for different control applications.

C. Claims 7 and 19

[7] The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

[19] The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

138. Nuhn and Mr. Prairie suggest that the combination of Truxor and Yoon or Carrier does not render Claims 7 and 19 obvious because of their dependence on claim 1. EX2029, ¶220. As explained above, the combination of Truxor and Yoon or Carrier discloses all the limitations of claim 1. *Supra* Section VIII.B.

139. Nuhn and Mr. Prairie also consider claims 7 and 19 if “fluid mover” is construed as a means-plus-function limitation. Mr. Prairie contends that Truxor “fails to disclose the structure described in the ’425 Patent specifications that performs the function of ‘moving fluid to control at least one of the speed and direction of the vehicle when the vehicle is floating.’” EX2029, ¶222. Nuhn and Mr. Prairie’s arguments are based around their incorrect interpretation of “fluid mover,” referencing a structure that performs the function of moving fluid: “valve(s) and fluid nozzle(s).” As noted above, these assertions are incorrect and these valve and nozzle structures, either alone or in combination, have no capability to move fluid and do not perform the function of moving fluid. In contrast, if the term “fluid mover” is construed as a means-plus-function limitation, a POSA would have understood the fluid mover disclosed in the ’425 Patent specification to be the pump, conduit, and nozzles. *Supra* Section VI.B.

140. Contrary to Mr. Prairie’s assertions, a POSA would have understood that the Truxor vehicle includes a fluid mover capable of controlling at least one of the speed and direction of the vehicle when floating. As shown in the image below, Truxor includes a pump, conduit, and nozzle for moving fluid.



EX1006, 10.

141. A POSA would have understood that pumping and discharging fluid through a conduit and nozzle will produce reaction forces in the opposite direction. Thus, operation of the Doro Pump and the nozzle of Truxor would produce a stream of fluid and a corresponding reaction force in the opposite direction. A POSA would have understood that the Doro Pump is hydraulically controlled and Truxor teaches “[a]djustable flow for all functions of the hydraulic system[.]” EX1006, 3. Thus, a POSA would have understood that by varying the adjustable flow to the Doro Pump’s hydraulic motor, the flow rate through the pump, conduit, and nozzle would also vary. A POSA would have understood that this would control the magnitude of

the reaction force generated by discharging fluid through the nozzle and along with it, the speed of the vehicle. A POSA would have understood that this is the same principle of operation that is used to control the speed or direction of jet boats.

142. Mr. Prairie also suggests that Truxor's Doro Pump is not powerful enough to overcome drag to propel or maneuver the Truxor vehicle while it is in water. EX2029, ¶236. A POSA would have understood that drag is a force which occurs when there is relative motion to a fluid, so when the pump of Truxor is turned on and reaction forces from the pump, conduit, and nozzle are generated, the vehicle will begin to accelerate in response to these forces. When those propulsive forces are balanced by the drag force, the vehicle will stop accelerating and reach an equilibrium speed. A POSA would have understood these basic engineering concepts related to hydrodynamics and propulsion. A POSA would have therefore understood that drag would not prevent motion of the vehicle, but would only serve to limit the speed at which the vehicle moves through the water. Thus, the pump, conduit, and nozzle of Truxor would control the speed and direction of the vehicle while floating. Mr. Prairie's opinion that the pump of Truxor would not be sufficiently powerful to overcome drag is without basis. A POSA would have understood that the drag force is effectively nil until the vehicle begins moving.

143. Mr. Prairie also argues that because the Truxor vehicle is shown in the brochure as partially on land and not moving when the pump is operating, the Doro

Pump would not control the speed or direction of the vehicle while floating. Nuhn similarly argues that if the vehicle were able to be controlled by the pump, conduit, and nozzle, the vehicle would be unable to hold station or maneuver with the dredge pump in use. Paper 27 at 50. Both of these arguments are nonsensical. A POSA would have understood that the Truxor vehicle can operate on land or water, not just an intermediary transitional position shown in one photograph. A POSA would have understood that the Truxor vehicle would respond and move in response to the reaction forces from the Doro Pump discharge when floating.

144. Contrary to Nuhn’s argument related to holding station, a POSA would have understood that the Truxor vehicle is equipped with paddle tracks and could be used to move fluid in the opposite direction and counter the reaction forces created by the Doro Pump discharge. Furthermore, as shown in the Truxor brochure, the vehicle may be positioned partially on land while pumping to anchor the vehicle so that it does not respond to the reaction forces from the pump.

145. Mr. Prairie incorrectly focuses his analysis on the presence or absence of a valve, given his proposed means-plus-function interpretation of “fluid mover,” even though a valve and nozzle cannot move fluid. *Supra* Section VI.B. Mr. Prairie suggests that because Truxor does not show a valve connected to the nozzle, it does not meet claims 7 and 19. EX2029, ¶222. Mr. Prairie fails to consider other methods that could be used to control the speed of the Truxor vehicle by varying the flow rate

from the pump and nozzle, and control the speed or direction of the vehicle, including varying the engine speed, and the flow-rate of hydraulic fluid to the Doro Pump.

146. Truxor discloses “[a]djustable flow for all functions of the hydraulic system[.]” EX1006, 3. A POSA would have understood that this adjustable flow of hydraulic fluid would be provided via valves in the hydraulic system, which are used to vary the flow hydraulic fluid to various components of the hydraulic system. EX1005, ¶¶[0042]-[0043]. A POSA would have understood that operation of the valves controlling the flow of hydraulic fluid to the Doro Pump hydraulic motor would vary the flow of fluid pumped by the Doro Pump to the nozzle. EX1123, 4-10. A POSA would have understood that varying the hydraulic flow to the Doro Pump would control the magnitude of the reaction force generated, and, accordingly, would control the speed or direction of the vehicle while floating.

D. Claim 12

[12] The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive.

147. Mr. Prairie contends that claim 12 is not obvious at least because of its dependence on claims 1-4. EX2029, ¶225. For the reasons described above, claim 1 is obvious and Mr. Prairie’s arguments to the contrary are unfounded. Mr. Prairie offers no critique as to the fact that the hydraulic pump of Truxor is connected to the

hydraulic pump by a mechanical drive. However, Mr. Prairie asserts that the connection between the diesel engine and the Doro Pump is not a mechanical drive, stating: “[i]nstead, it is a *hydraulic* connection.” *Id.*, ¶226 (emphasis in original).

148. It appears that Mr. Prairie is suggesting that any type of power transmission system that utilizes fluid or hydraulics for power transmission is no longer a mechanical system and cannot therefore include a mechanical drive. As explained above, it is my opinion that a hydraulic transmission system would properly be considered to be a “mechanical drive.” *Supra* Section VII.D.

149. Furthermore, as explained above, even if a hydraulic power transmission is determined to be something other than a “mechanical drive,” systems using hydraulic power transmission necessarily include one or more “mechanical drives” such as the drive shaft powering the hydraulic pump or the drive shaft that extends from the output of the hydraulic motor. *Supra* Section VII.D. A POSA would have understood that each of these components would be present in the Doro Pump hydraulic transmission system. A POSA would have understood that because independent claim 1 uses the term “comprising,” additional components present within the connection between the fluid pump and the power source would still meet the language of the claim. *Supra* Section VII.D.

E. Claims 2-6, 13-18

[2] The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump.

[3] The vehicle of claim 2, wherein the conduit comprises an opening at the end thereof.

[4] The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening.

[5] The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit.

[6] The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit.

[13] The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed.

[14] The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels.

[15] The vehicle of claim 14, wherein the set of wheels comprises at least two powered wheels.

[16] The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed.

[17] The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor.

[18] The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit.

150. Claims 2-6 and 13-18 each depend from claim 1. I understand that 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.

151. As discussed in my prior declaration, it is my opinion that claims 2-6 and 13-18 are rendered obvious by Truxor in view of Yoon or Carrier. EX1004, Section VIII.

IX. GROUND 3: CLAIMS 1-7 AND 12-19 ARE RENDERED OBVIOUS BY SENWATEC IN VIEW OF YOON OR CARRIER

152. Claims 1-7 and 12-19 of the '425 Patent are rendered obvious by SenwaTec in view of Yoon or Carrier. SenwaTec teaches 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. As described herein, Nuhn's and Mr. Prairie's allegations that SenwaTec combined with Yoon or Carrier would not render claims 1-7 and 12-19 obvious are wrong.

A. Motivation to Combine

153. I understand that Nuhn does not provide any argument in its Response that a POSA would have lacked a motivation to combine, or a reasonable expectation of success in combining SenwaTec with Yoon or Carrier. 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. *Id.*

154. Mr. Prairie provides the same arguments regarding the motivation to combine SenwaTec and Truxor. As described above, each of these arguments provided by Mr. Prairie are wrong and contradict the evidence regarding the motivations of a POSA. *Supra* Section VIII.A.

B. Claim 1

[1.0] An amphibious vehicle comprising:

[1.1] a floatable vehicle body;

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

[1.3] a fluid pump for pumping liquid manure;

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

[1.5] a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion

structure; (2) control a flow of liquid manure from the fluid pump; (3) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (4) control at least one of the speed and direction of the vehicle when the vehicle is floating.

i. SenwaTec Discloses a Fluid Pump for Pumping Liquid Manure.

155. Mr. Prairie asserts that Claim 1 is not rendered obvious by SenwaTec in view of Yoon or Carrier, because the dredge pump of SenwaTec is not a fluid pump to pump liquid manure. EX2029, ¶241.

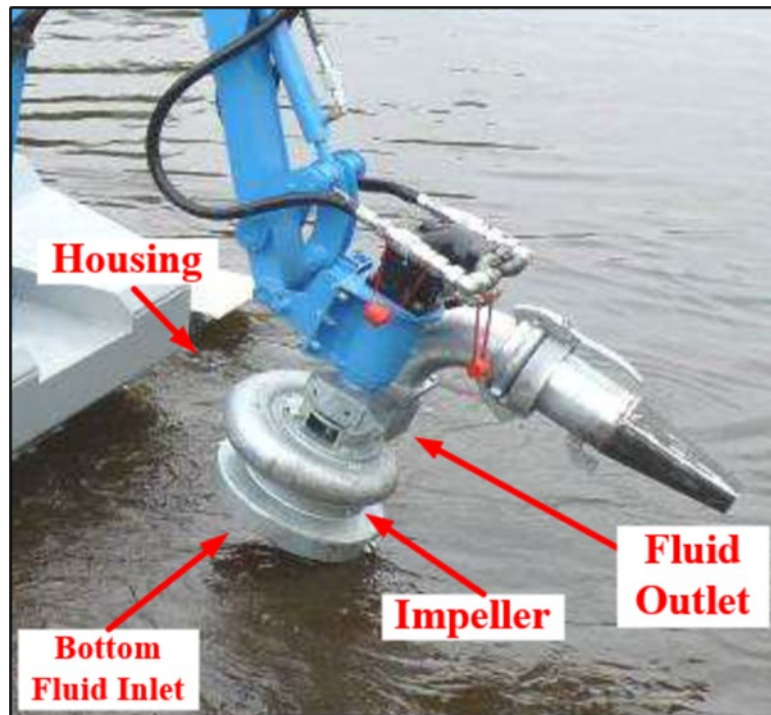
156. Mr. Prairie contends that SenwaTec does not teach that the SenwaTec pump is capable of pumping liquid manure. *Id.*, ¶244. Mr. Prairie cites the institution decision where the PTAB noted that he argued that sewage ponds and manure lagoons are different. *Id.*, ¶243. However, this does not show that SenwaTec does not pump liquid manure. Rather, 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 12 at 26.

157. Mr. Prairie repeats the argument presented in Ground 2 (*supra* Section VIII), regarding a comparative analysis of the SenwaTec pump to other manure pumps. EX2029, ¶245. As noted above, such details are unnecessary because a POSA would possess a general understanding of the capabilities of a dredging pump. Further, the pumping capacity and engine power are specified within SenwaTec.

Nonetheless, as detailed below, the SenwaTec includes many of the same structural characteristics as the Houle pump, relied on extensively by Nuhn and Mr. Prairie.

158. 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 the fluid outlet.

159. 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.

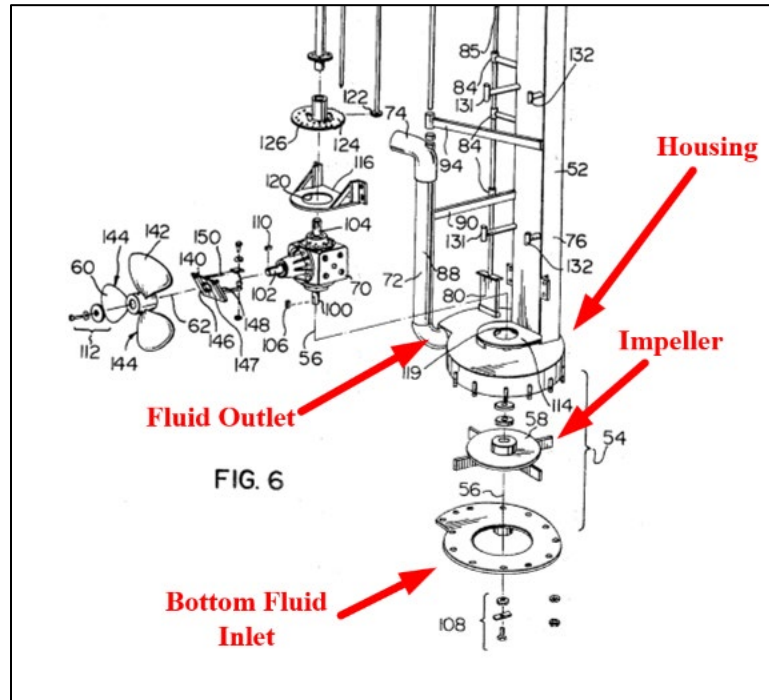


EX1012, 1 (annotated).

160. A POSA would have understood that dredge pumps such as the SenwaTec pump have long been used to pump liquid manure. EX1040, 41-42, 54-58; EX1054, 38, 76-77; EX1066, 42-46, 104; EX1085, 1; EX1086, 3.

161. As shown 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, 5. While these structural features are not required nor are they the only pump configuration known in the art for pumping liquid manure, 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. EX1064, 11-13.



EX2010, FIG. 6 (annotated).

162. Once again, Mr. Prairie argues about the capability of centrifugal pumps for pumping liquid manure. As described above, these arguments are incorrect and contradicted by the '425 Patent, Houle, and the manure pumping literature. *Supra* Section VIII.B.i. Mr. Prairie's arguments regarding the alleged high total solids content and non-Newtonian behavior of liquid manure are similarly flawed. *Supra* Section VIII.B.i. As described 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. *Supra* Section VIII.B.i.

163. Moreover, SenwaTec discloses a pump that was used to pump various forms and concentrations of manure. I understand that EX1081 and EX1082 are the full video and accompanying translation of EX1028. As shown in EX1081 at 8:54-10:18, SenwaTec pumped human waste from a holding reservoir, 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 EX1081 and EX1082 to be manure.

164. EX1083-EX1084 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. EX2029, ¶23. Mr. Funk, the operator of the vehicle in EX1081-EX1084, 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. EX1094, ¶32 (emphasis added). And while Nuhn argues that human manure in "sewage treatment plants ... does not have straw or sand mixed in with the waste[,]" the video of EX1081 shows the reservoir containing large amounts of straw-like material

mixed in with the human manure. EX1081, 7:59-8:22; Paper 27 at 56. Nuhn also attempts to distinguish the manure pumped by the Amphi-King based on the bacterial breakdown of the waste (Paper 27 at 55), 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].

165. 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.

166. 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.” 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. EX1063, 42-80.

167. 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.” EX1063, 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.” EX1063, 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 EX1063, EX2022 describes sedimentation tanks where suspended solids sink to the bottom and the mass of solids is called primary sludge. EX2022, 11.

168. 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.

169. Mr. Prairie also suggests that there is nothing “in SenwaTec [EX1012] that describes or suggests that its pump is capable of pumping the hard thick crusts that a POSITA would have understood to be in the liquid manure prior to agitation.” EX2029, ¶246. Aside from the obvious application and disclosure that the SenwaTec

vehicle is used for dredging applications and would be capable of pumping solids, EX1028, 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 declaration of Mr. Lonnemann (EX1013, 2), 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 EX1082 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. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



EX1028, 1, 3.

170. 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.

171. 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.

ii. The Combination of SenwaTec and Yoon or Carrier Discloses All of the Remote-Control Limitations of Claim 1.

172. Nuhn and Mr. Prairie assert that the SenwaTec combination fails to disclose all of the wireless remote control limitations of Claim 1. Nuhn and Mr. Prairie do not provide any analysis and do not offer any arguments that the remote-control system of Yoon or Carrier would not function to control the flow of liquid manure from the dredge pump of SenwaTec. Indeed, a POSA would have been

motivated to add remote control to the SenwaTec vehicle and would have had a reasonable expectation of success. *Supra* Section IX.A. Rather, Mr. Prairie bases his entire argument around his notion that the dredge pump of SenwaTec would be incapable of pumping liquid manure. As explained above, a POSA would have understood that the SenwaTec dredge pump was capable of pumping liquid manure. *Supra* Section IX.B.i.

iii. SenwaTec Discloses the Claimed Combination of Elements.

173. Mr. Prairie asserts that the claims of the '425 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. EX2029, ¶¶250-251. Mr. Prairie's statement is contrary to the express language of the '425 Patent claims. Specifically, claims 1-21 of the '425 Patent do not provide any reference to "crust" or to the function of "disrupting the crust."

174. Mr. Prairie contends that because SenwaTec describes various other capabilities in addition to dredging, it would not serve as an amphibious manure lagoon pumping/agitation vehicle. *Id.*, ¶¶251-252. Mr. Prairie's analysis focuses on other capabilities of SenwaTec, while summarily ignoring the function, purpose, and capabilities of dredge pumps, like the centrifugal dredge pump of SenwaTec. The fact that SenwaTec is a multi-functional vehicle with other attachments and capabilities is irrelevant to the question at hand: whether the SenwaTec pump is

capable of pumping liquids with suspended solids. As described herein, a POSA would have understood that the dredge pump of SenwaTec was capable of pumping liquid manure containing some suspended solids. *Supra* Section IX.B.i. **A POSA Would Have Had a Reasonable Expectation of Success in Combining SenwaTec with Yoon or Carrier.**

175. Separate from his discussion of the motivation to combine Truxor or SenwaTec with Yoon or Carrier, 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. EX2029, ¶255.

176. Mr. Prairie, inappropriately, 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. *Supra* Section VIII.B.iv. 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. *Supra* Section VIII.B.iv.

177. Mr. Prairie relies on images from SenwaTec's marketing brochure (EX1012) of the operator standing up while operating the vehicle to support his position that remote control of the SenwaTec vehicle would be problematic.

EX2029, ¶264. First, Mr. Prairie's assumptions as to what the operators are doing and why they are doing it are speculative, at best. However, even if Mr. Prairie is correct in his assumptions that the operator is standing to provide a better view of the pump, Mr. Prairie has not demonstrated that would prevent the successful application of remote controls to the SenwaTec vehicle.

178. In fact, a POSA considering the images relied on by Mr. Prairie, 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. Mr. Prairie fails to consider that if the operator were positioned onshore, he might have an unobstructed view of the pump because the front end of the vehicle would not be obstructing his view, if he were operating remotely from shore.



EX1012, 2 (annotated).

179. Mr. Prairie asserts that a POSA would expect instability issues on the vehicle by implementing remote control. EX2029, ¶267. 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.

180. Mr. Prairie contends that a POSA would have not a reasonable expectation that adding remote control to SenwaTec would be successful because the vehicle would not be able to traverse the embankments on a liquid manure lagoon. *Id.*, ¶267. However, Mr. Prairie ignores the heavy-duty off-road tires that are

disclosed by SenwaTec, which a POSA would have understood to be well-suited for negotiating such conditions.



EX1012, 2.

181. In sum, Mr. Prairie's arguments that the combination of SenwaTec with the remote-control systems of Yoon or Carrier would be unsuccessful are unreliable and based on inappropriate and unrelated references. 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, ¶¶292-297; *Supra* Section IX.A.

C. Claims 7 and 19

[7] The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

[19] The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

182. Mr. Prairie suggests that the combination of SenwaTec and Yoon or Carrier does not render Claims 7 and 19 obvious because of their dependence on claim 1. EX2029, ¶274. As explained above, the combination of SenwaTec and Yoon or Carrier discloses all the limitations of claim 1. *Supra* Section IX.B.

183. Nuhn and Mr. Prairie also consider claims 7 and 19 if “fluid mover” is construed as a means-plus-function limitation. As discussed in my prior declaration, SenwaTec discloses a nozzle, a conduit, and a “powerful centrifugal pump” that would produce a reaction force when spraying fluid. EX1012, 1; *see* EX1004, ¶314. Thus, the vehicle of SenwaTec could be propelled and steered (and thus the speed or direction of the vehicle could be controlled) by using the “powerful centrifugal pump” to spray jets of fluid in the opposite direction. EX1012, 1. SenwaTec discloses that all of the hydraulics system functions are “variable and speed adjustable[.]” *Id.*, 3. Thus, a POSA would have understood that by varying the adjustable hydraulic flow to the centrifugal pump, the flow rate through the pump, conduit, and nozzle would similarly varied. A POSA would have understood that this would control the magnitude of the reaction force generated by discharging fluid

through the nozzle and along with it, the speed of the vehicle. This is the same principle of operation that is used to control the speed or direction of jet boats.

184. While Mr. Prairie argues that there is no disclosure in SenwaTec is powerful enough to overcome drag to propel or maneuver the SenwaTec vehicle while it is in water, SenwaTec discloses a “powerful centrifugal pump... delivering 40kW of pumping power.” *Id.*, 1. This is in the same range of horsepower of many jet boats, which utilize the same principle for propulsion. *Jet Boat vs. Inboard Boat*, J.D.POWER, (last visited Aug. 05, 2024) <https://www.jdpower.com/boats/shopping-guides/jet-boat-vs-inboard-boat>.

185. Furthermore, I understand that there are pictures which show Mr. Funck operating the Amphi-King and propelling the Amphi-King using the pump. I understand that Mr. Funck has described how he used the pump to control the vehicle speed and direction. EX1094, ¶33.h.



EX1131, 145.

186. While Mr. Prairie alleges that drag forces would prevent propulsion of the vehicle, as discussed above, a POSA would have therefore understood that drag would not prevent motion of the vehicle, but would only serve to limit the speed at which the vehicle moves through the water. *Supra* Section VIII.C. Thus, the pump, conduit, and nozzle of SenwaTec would control the speed and direction of the vehicle while floating. Mr. Prairie's comments and opinions on this concept with respect to Truxor and SenwaTec are seemingly based on speculation or willful ignorance or a combination thereof.

187. Nuhn has argued that if the similar vehicle of Truxor was able to be controlled by the pump, conduit, and nozzle, the vehicle would be unable to hold station or maneuver with the dredge pump in use. Paper 27 at 50. This argument is

nonsensical with respect to both Truxor and SenwaTec. Further, a POSA would have understood that the vehicle's separate hydraulic auger propulsion could be used to counter the reaction forces from the SenwaTec pump discharge while pumping. Furthermore, as shown in the SenwaTec brochure, the vehicle may be positioned partially on land while pumping to anchor the vehicle so that it does not respond to the reaction forces from the pump.

188. Mr. Prairie, incorrectly, focuses his analysis on the presence or absence of a valve, which again, is not capable of moving fluid. EX2029, ¶279. However, SenwaTec discloses that all functions of its hydraulics system are “variable and speed adjustable[.]” EX1012, 3. A POSA would have understood that this adjustable flow of hydraulic fluid would be provided via valves in the hydraulic system, which are used to vary the flow hydraulic fluid to various components of the hydraulic system. A POSA would have understood that operation of the valves controlling the flow of hydraulic fluid to the centrifugal pump's hydraulic motor would vary the flow of fluid pumped by the centrifugal pump to the nozzle. EX1123, 4-10. This would result in varying the speed or direction of the vehicle while floating.

D. Claim 12

[12] The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive.

189. Mr. Prairie contends that claim 12 is not obvious at least because of its dependence on claims 1-4. EX2029, ¶281. For the reasons described above, claim 1 is obvious and Mr. Prairie's arguments to the contrary are unfounded. *Supra* Section IX.A. Mr. Prairie offers no critique as to the fact that the dredge pump of SenwaTec is connected to the hydraulic pump by a mechanical drive. However, Mr. Prairie asserts that not to be the case between the diesel engine and SenwaTec's pump stating "[i]nstead, it is a **hydraulic** connection." EX2029, ¶282 (emphasis in original). Mr. Prairie is wrong.

190. For the same reasons as those described above with respect to Doro Pump of Truxor, a POSA would have understood that the centrifugal pump of SenwaTec is connected to the vehicle engine by a mechanical drive. *Supra* Section VIII.D.

E. Claims 2-6, 8, and 13-18

[2] The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump.

[3] The vehicle of claim 2, wherein the conduit comprises an opening at the end thereof.

[4] The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening.

[5] The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit.

[6] The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit.

[13] The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed.

[14] The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels.

[15] The vehicle of claim 14, wherein the set of wheels comprises at least two powered wheels.

[16] The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed.

[17] The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor.

[18] The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit.

191. Claims 2-6 and 13-18 each depend from claim 1. I understand that 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.

192. 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 IX.

X. GROUND 4: CLAIMS 1-21 ARE RENDERED OBVIOUS BY THE COMBINATION OF PUCK AND BRYHAM

193. Claims 1-21 of the '425 Patent are rendered obvious by Puck in view of Bryham. POSAs would have been motivated to add the ground engaging wheels to Puck and would have had a reasonable expectation of success.

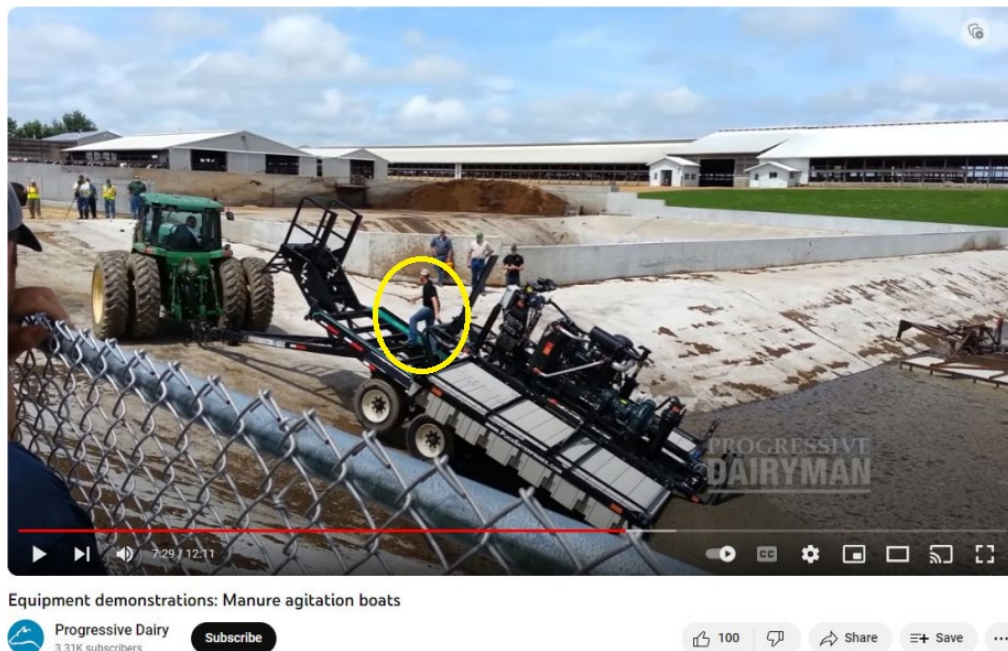
A. Motivation to Combine

194. 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, ¶¶331-340. Nuhn does not provide any counterargument to the fact that the combination of Puck and Bryham would not make launching and retrieving the vehicle safer and easier.

195. Mr. Prairie asserts that launching and retrieving Puck's boat does not require a user to enter or go near a manure lagoon. EX2004, ¶¶191-192. Mr. Prairie cites a 2014 video by Progressive Dairyman (EX2008) which shows the Puck boat being launched. However, Mr. Prairie is wrong.

196. The launching process of the Puck vehicle *does* put a user in close proximity to the reservoir, as illustrated in the Progressive Dairyman video below. 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.



EX2008, 6 (annotated).

197. Mr. Prairie fails to consider that EX2008 does not show the Puck vehicle being retrieved from the reservoir, 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. 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 in order 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. In order to rinse the vehicle as it is loaded onto the trailer, as Puck describes, an operator would need to be adjacent to or in the manure lagoon with a hose and nozzle to spray the vehicle down. Mr. Prairie fails to even consider the retrieval process and bases his opinions on one specific video which shows only half of the process of launching and retrieving the Puck vehicle.

198. 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. 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. EX1015, 1:57-58. 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.

199. For the reasons described herein, Nuhn and Mr. Prairie are wrong. A POSA would have understood that adding the amphibious wheels of Bryham to the

Puck vehicle would make launching and retrieving the Puck vehicle both easier and safer for a user.

B. Claim 1

[1.0] An amphibious vehicle comprising:

[1.1] a floatable vehicle body;

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

[1.3] a fluid pump for pumping liquid manure;

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

[1.5] a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion structure; (2) control a flow of liquid manure from the fluid pump; (3) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (4) control at least one of the speed and direction of the vehicle when the vehicle is floating.

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

200. Mr. Prairie asserts that neither Puck nor Bryham disclose a power source that provides power to both a manure pump and a ground engaging propulsion structure. EX2029, ¶297. Mr. Prairie is wrong. As an initial matter, Mr. Prairie misrepresents the content of Claim 1 and the term “manure pump” does not appear anywhere in Claim 1.

201. In offering this opinion Mr. Prairie disregards 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.

202. In view of these teachings of Bryham, it would have been obvious for a POSA to use the engine of Puck, which is already described as being connected to the slurry pump (EX1014, ¶[0025]), with a power take off shaft to power the hydraulic pump (as described in Bryham (EX1015, 15:61-67)) which Bryham describes as driving the vehicle wheels. Furthermore, Puck specifically describes how its preferred power source is a John Deere Tier 3 diesel engine. EX1014, ¶[0024]. A review of such diesel engines indicates that they are already equipped with an optional rear PTO. EX1130.

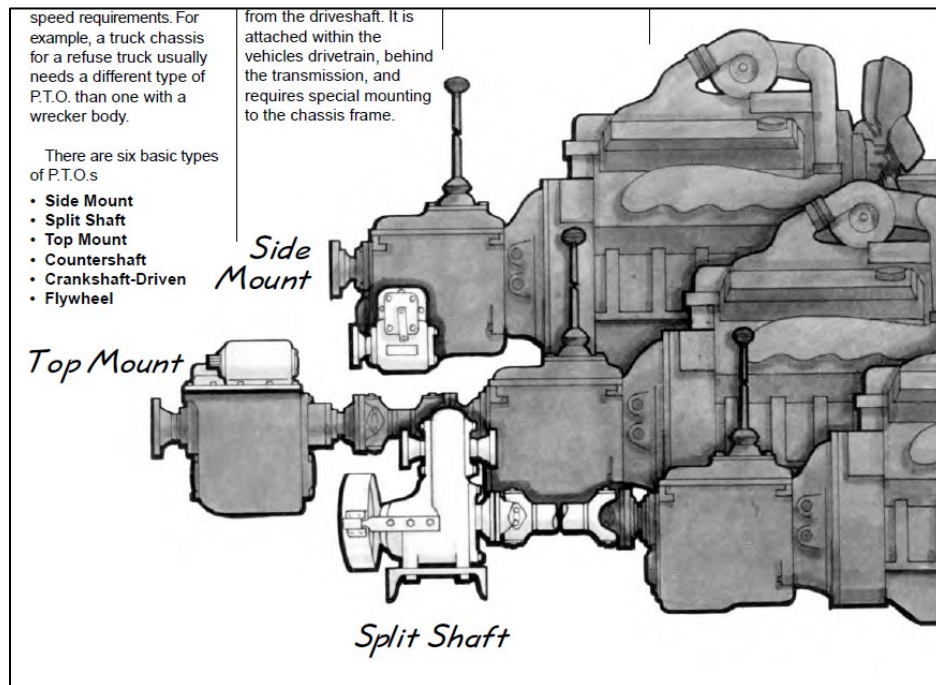
203. Without attempting to refute the accuracy of my opinion or what a POSA would have understood on the topic, Mr. Prairie alleges that I did not explain why powering the pump and ground engaging propulsions structure from a single engine would be less expensive, more efficient, take up less space and weigh less. EX2029, ¶¶298-299. Mr. Prairie disregards the understanding of a POSA with respect to well-known PTO systems.

204. 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 known to POSAs for a considerable period prior to the '425 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. EX1116, 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 provides that

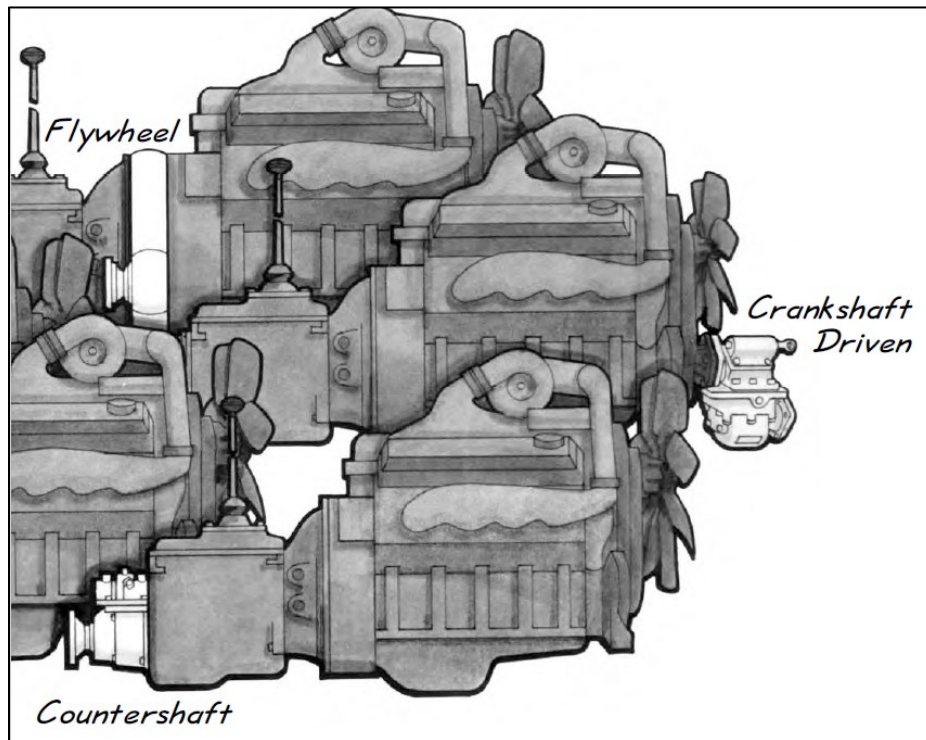
Improvements in tractor design and performance continued at a swift pace. In the 1920s the major innovation was the power take-off shaft. It enabled tractor power to be applied directly to harvesting implements, eliminating the need for auxiliary engines. The power take-off shaft also allowed the development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

EX1117, 71-72.

205. As to the weight and space requirements, a POSA would have understood that the cost of a PTO and the space required for 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 PTO and a secondary engine would have been readily apparent to a POSA. An example of the relative size of a PTO unit compared to the engine and transmission is illustrated in the images below (different types of PTO units are shown in white). EX1125, 6-7.



EX1125, 6.



EX1125, 7.

206. 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 PTO systems to power both. 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 are not obvious. A POSA would have been familiar with a variety of PTO options and would have understood the many benefits I have described herein.

207. 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 claim 1 obvious. EX2029, ¶299.

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 Tier 3 diesel engine on the Puck vehicle was readily capable of providing output power to more than one device with the integration of a PTO system.

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

208. Mr. Prairie asserts that Puck’s remote-control system could not provide wireless remote control of ground engaging propulsion. EX2029, ¶¶300-301. However, Mr. Prairie is 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, ¶¶331-340.

209. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

210. 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. 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.

211. The '425 Patent supports my conclusions on this topic. The '425 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 of the remote-control system or the devices it controls. EX1001, 4:32-58. For example, the '425 Patent provides that the “remote control structure may comprise a wireless transmitter and a wireless receiver.” EX1001, 4:37-38. Regarding the ground-engaging propulsion system, the '425 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.” EX1001, 4:39-41. Almost no other details of the remote-control system or its structure are provided in the '425 Patent. 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. EX1001, 4:50-52; EX1123, 4.

212. 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.

213. 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

the 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].

214. 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. 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. 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.

215. 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.

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

216. Separate from his discussion of the motivation to combine Puck and Bryham, Mr. Prairie opines that a POSA would not have had a reasonable expectation of success in making such a combination. EX2029, ¶311. Mr. Prairie cites the specific shape of the hulls of the Bryham and Puck vehicles and the off-road capabilities of the Bryham wheel system. *Id.*, ¶¶312-320. As explained herein, Mr. Prairie's perceived deficiencies do not reflect what a POSA would have understood. To the extent any such deficiencies exist, Mr. Prairie has not demonstrated that their solutions were not readily available with the application of common sense using the capabilities of a POSA and a general understanding of engineering design thereby preventing any reasonable expectation of success.

217. Mr. Prairie contends that Bryham's wheels could not be implemented on the barge shaped hull of Puck. *Id.* Mr. Prairie is wrong because his arguments are based on specific 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.

218. 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 airboats are not typically “vee-hulled” and are much flatter and boxier in shape and that they often have a broad up-turned bow:³

³ <http://www.classicairboats.com/Sites/48/Images/indexboat.jpg>



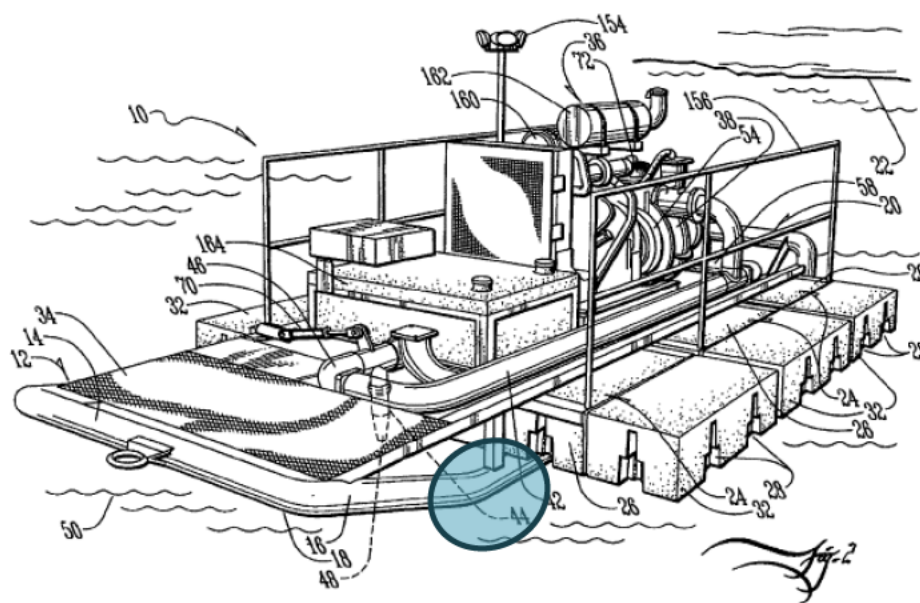
219. Three-wheel and four-wheel amphibious configurations were known in the art, and a POSA would have been capable of deciding between these design choices and adapting either to the vehicle of Puck. Bryham contemplates configurations with more than three wheels and the processes of applying a four-wheeled version of Bryham would be straightforward and would yield predictable results.

220. Alternately, a POSA would have understood that the bow of the Puck vehicle could accommodate a single wheel being attached at the bow in a three-wheeled configuration without significantly altering the capabilities of the vehicle. Again, the choice of three- or four-wheel configurations would have been a matter of design choice, and a POSA would have had a reasonable likelihood of success in attaching either three or four of Bryham's amphibious wheel assemblies to the Puck vehicle. Mr. Prairie has not provided any reliable evidence otherwise.

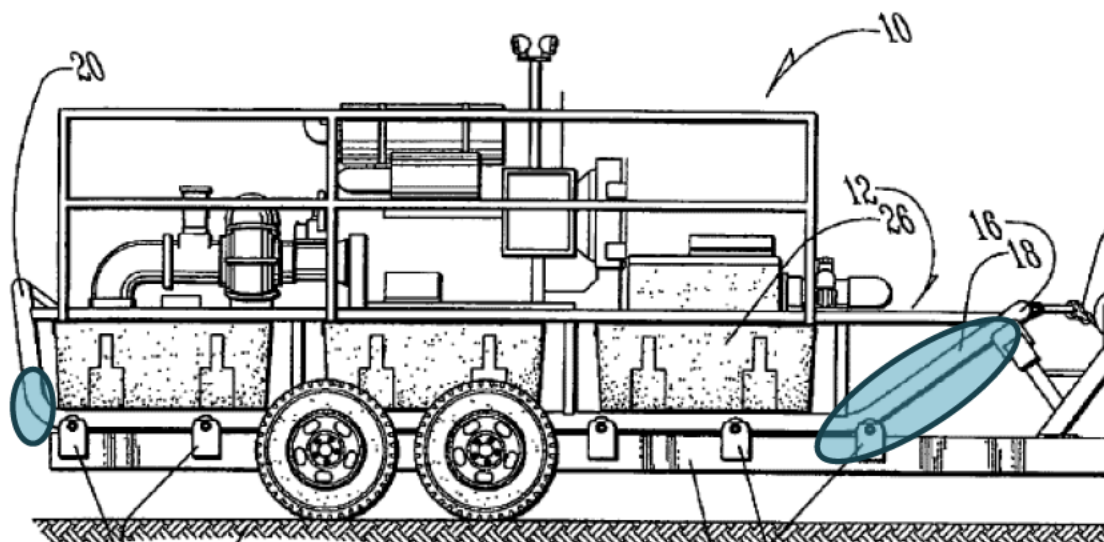
221. Regarding the retracting wheels of Bryham, Mr. Prairie contends that the combination may not be successful because Bryham's wheels would interfere with the modular dock sections of Puck. EX2029, ¶315. Mr. Prairie does not provide any drawings or analysis to support his position that the wheels of 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.

222. Mr. Prairie is 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).



EX1014, FIG. 8 (annotated).

223. Further, retractability of Bryham's wheels would not prevent a successful combination of Puck and Bryham. There is nothing about the claims of the '425 Patent that require the wheels of the amphibious vehicle to retract. While this is a feature of Bryham, a POSA would have understood that Bryham could function to provide an amphibious vehicle without using its retracting features. EX1015, 3:15-17. A POSA would have understood that many amphibious vehicles do not necessarily require that the wheels retract, and that for slower-speed displacement craft, like the Puck vehicle, retraction of the wheels is not necessary. *See, e.g.*, EX1115, ¶7.

224. Mr. Prairie also contends that the dock sections of Puck are not designed to be connected when raised off of the surface of the lagoon. EX2029, ¶317. Mr. Prairie’s arguments are 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.” EX2029, ¶317. 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.

225. 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. EX1014, ¶[0022]. 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,” (EX1014, ¶[0022]) rather than to the floating dock sections themselves.

226. Mr. Prairie also alleges that Bryham’s three-wheel design would be inherently unstable for entering and exiting a liquid manure lagoon. EX2029, ¶319. 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.

227. 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 a "slippery embankment" is misplaced. Bryham teaches the use of 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 type 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. The '425 Patent does not teach any structure or feature that a POSA would have understood to give it greater capabilities than Bryham for traversing "steep and slippery embankments," as Mr. Prairie contends. An archived webpage of Bryham's commercial embodiment confirms the all-terrain nature of the vehicle and its ability to navigate steep embankments. EX1122.

228. 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* EX1122.

229. Mr. Prairie provides the opinion that Bryham only has two powered wheels at the stern and concludes that the front wheel(s) of Bryham are unpowered. EX2029, ¶319. Mr. Prairie is wrong. Bryham does not teach, and a POSA would not have understood, that only two wheels of the Bryham vehicle can be powered. Mr. Prairie’s conclusion is not based on any specific teachings from Bryham, but seems to be based exclusively on his own incorrect assumption. On the contrary, Bryham teaches that “one *or more* of the ground engaging means ... is provided with motive power.” EX1015, 6:47-48 (emphasis added). A POSA would have understood from the teachings of Bryham that any number of wheels could be provided with motive power, including all the wheels. *Id.* The choice between two, three, four, or any number of powered wheels is a matter of design choice, and a POSA would have understood that any and all of the Bryham wheels could be powered. Mr. Prairie provides no reference to Bryham to support his position that Bryham is limited with “only two powered wheels.” Again, Mr. Prairie is inventing deficiencies that do not exist.

230. Mr. Prairie provides additional criticism of the front tire of Bryham, and seems to suggest that it would be incapable of turning the vehicle. EX2029, ¶319. 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. 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.

231. In sum, Mr. Prairie's bases for concluding that the combination of Puck and Bryham would not have a reasonable expectation of success have been demonstrated to be unreliable or non-existent. Many of his opinions are contrary to the explicit teachings in the art and contrary to what a POSA would have understood.

C. Claim 13

[13] The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed.

232. Regarding claim 13, Mr. Prairie asserts that Puck and Bryham would not be combined to provide a variable speed, remotely controlled ground engaging propulsion structure. EX2029, ¶332-336. Mr. Prairie is wrong.

233. 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. 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.

234. Furthermore, Bryham does not need to describe the specific type of valve and whether the valves are binary ON/OFF type valves or proportioning type valves. A POSA would have understood that both styles of valve could be implemented but would have also understood the benefits of using a proportional valve and have understood that most valves can be deployed in a variety of partially open or partially closed positions. EX1123, 6-10. A POSA would have understood that it would be desirable to regulate and provide a controlled amount of hydraulic flow to the hydraulic motors and to provide a vehicle that can operate at more than one speed.

235. Even if the valves of Bryham were single speed, a POSA would have understood that it would have been obvious to configure the valves to be operable at variable speed. The overwhelming majority of wheeled amphibious vehicles can be operated at variable speed, both on land and afloat. Mr. Prairie provides no explanation as to why a POSA would have believed that the wheels of Bryham would only be operable at a single speed.

D. Claims 2-12 and 14-21

[2] The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump.

[3] The vehicle of claim 2, wherein the conduit comprises an opening at the end thereof.

[4] The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening.

[5] The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit.

[6] The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit.

[7] The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

[8] The vehicle of claim 1, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

[9] The vehicle of claim 8, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

[10] The vehicle of claim 4, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

[11] The vehicle of claim 10, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

[12] The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive.

[14] The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels.

[15] The vehicle of claim 14, wherein the set of wheels comprises at least two powered wheels.

[16] The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed.

[17] The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor.

[18] The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit.

[19] The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

[20] The vehicle of claim 17, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

[21] The vehicle of claim 20, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

236. Claims 2-12 and 14-21 each depend from claim 1. I understand that 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.

237. 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 1-21 ARE RENDERED OBVIOUS BY THE COMBINATION OF PUCK AND BRYHAM AND BENNETT-II

A. Motivation to Combine

238. The arguments presented by Nuhn and Mr. Prairie with regard to the Puck, Bryham, and Bennett-II combination are generally the same as they provide for the Puck and Bryham combination. As explained previously, Mr. Prairie and Nuhn are incorrect in their assertions regarding the motivation and expectation of success in combining Puck and Bryham. *Supra* Sections X.A and X.B.iii.

239. With regard to Bennett-II, Mr. Prairie 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. EX2029, ¶374. 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.B.i.

240. While Mr. Prairie makes arguments about the relative traction and steering capabilities of Bennett-II and Bryham, he provides no comparative analysis or support for his conclusion that Bryham would provide worse traction and steering than the Bennett-II tracks. EX2029, ¶374. Even if Mr. Prairie were correct, it is completely irrelevant whether the wheels of Bryham provide less or more traction

than Bennett-II's tracks or whether the wheels of Bryham provide better or worse steering ability than Bennett-II's tracks. A POSA would have had a reasonable expectation of success in implementing remote control 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.

B. Claim 1

[1.0] An amphibious vehicle comprising:

[1.1] a floatable vehicle body;

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

[1.3] a fluid pump for pumping liquid manure;

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

[1.5] a wireless remote control configured to enable an operator who is remote from the vehicle to: (1) control the ground engaging propulsion structure; (2) control a flow of liquid manure from the fluid pump; (3) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (4) control at least one of the speed and direction of the vehicle when the vehicle is floating.

i. The Combination of Puck, Bryham, and Bennett-II Disclose Remote Control Configured To Control The Ground Engaging Propulsion Structure.

241. 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 '425 Patent itself, which further shows the ubiquitous and generally known nature of remote-control systems when Nuhn filed its provisional patent application.

242. 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]. The Bennett-II drive system is highly analogous to the Bryham drive system in that it includes a plurality of powered wheels (EX1017, ¶[0048]), a hydraulic drivetrain (*id.*, ¶[0083]), and hydraulic drive motors powering the wheels (*id.*), and valves controlling the flow of hydraulic fluid to the hydraulic drive motors (*id.*, ¶¶[0093]-[0094]).

243. 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 motors powering the Bennett-II tracks are controlled by valves which vary the flow of hydraulic fluid to the hydraulic

motors. 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 wheel motors, 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 be controlled to vary the position of such valves to operate the ground engaging propulsion structure at variable speed and direction. EX1014, ¶¶[0033]-[0034]; *supra* Sections X.B.ii and X.B.C.

244. 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. This is the same mechanism required to control the hydraulic wheel motors of Bryham for providing remote control of the ground engaging propulsion structure of the Bryham/Puck/Bennett-II combination. A POSA would therefore have understood that the remote-control system of Bennett-II would control the ground engaging propulsion system of

Bryham with little or no modifications required and a POSA would have reasonable expectation of success.

245. Mr. Prairie argues that Bennett-II lacks an “express teaching” of how remote control of its ground engaging propulsion structure is implemented. However, Bennett-II did not need to provide “any express teaching of how” to implement remote control, because a POSA would have been familiar with remote controls for a variety of systems and components, including the control of hydraulic valves and systems. Bennett-II provides considerable detail of how hydraulic pumps and valves are used to control the ground engaging means. EX1017, ¶¶[0093]-[0094]. A POSA would have understood that the remote-control system of Bennett-II would be used to control the position of these valves to regulate the flow of hydraulic fluid to the land-based propulsion system of Bryham.

246. Mr. Prairie’s argument that Bennett-II fails to *explicitly teach how* the remote-control system would control the ground engaging means, is also belied by the ’425 Patent. The ’425 Patent does not *explicitly teach how* remote control of various systems is accomplished and does not provide any details of the structure and/or individual components of the remote-control device(s) or how they interact with the structures and systems being controlled. For example, the ’425 Patent teaches that the vehicle can be controlled when ground engaging, but it does not explain *how*, because a POSA would have already known how to implement remote

control systems. Describing the remote control of ground engaging means, the '425 Patent provides that “[t]he vehicle may be remotely controllable by an operator remote from the vehicle when the vehicle is ground engaging and when the vehicle is floating.” EX1001, 4:34-37. Accordingly, Mr. Prairie’s criticisms and perceived deficiencies of the Bennett-II remote control system are belied by the '425 Patent and are arbitrary, unreliable, and inconsistent with what a POSA would have understood from the teachings of Bennett-II.

ii. 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.

247. 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.i.

248. 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.* 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* Sections X.A and X.B.i.

249. 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. Furthermore, Puck specifically describes how its preferred power source is a John Deere Tier 3 diesel engine. A review of such diesel engines indicates that they are equipped with an optional rear PTO. EX1030. A POSA would have understood that the Puck engine was readily configurable to power multiple devices, not just the fluid pump. 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. 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.

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

250. The arguments presented by Nuhn and Mr. Prairie regarding the Puck, Bryham, and Bennett-II combination are generally the same as they provide 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.B.iii.

251. 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. EX2029, ¶374. 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 XI.B.i. 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.

C. Claim 13

[13] The vehicle of claim 12, wherein the wireless remote control is configured to operate the hydraulic motor to operate the ground engaging propulsion structure at variable speed.

252. Regarding claim 13, Mr. Prairie asserts that one would not be motivated to provide remote control operation of the hydraulic motor to operate the ground engaging propulsion structure at variable speed. EX2029, ¶¶386-390.

253. As noted above, a POSA would have understood that Puck teaches the remote control of hydraulic flow and the remote control of valves to control the orientation of pivot pipes and slurry output for steering the vehicle when floating. EX1014, ¶¶[0032]-[0035]. It would be a straightforward process to utilize the remote control to open and/or close valves to regulate the flow of hydraulic fluid to the hydraulic wheel motors of Bryham and a POSA would have a reasonable expectation of success in combining the remote control of Puck with the wheels of Bryham. A POSA would have understood that either ON/OFF type valves or proportioning type hydraulic valves could be implemented and would have also understood the benefits of using a proportional valve. EX1123, 6-10. A POSA would have also understood that most valves can be deployed in a variety of partially open or partially closed positions. A POSA would have understood that it would be desirable to regulate and provide a controlled amount of hydraulic flow to the hydraulic motors and to provide a vehicle that can operate at more than one speed.

254. Furthermore, a POSA would have understood that the wheels of Bryham could be operated at variable speed using the remote control of Puck. 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. 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.

D. Claims 2-12 and 14-21

[2] The vehicle of claim 1, wherein the vehicle further comprises a conduit fluidly connected to the fluid pump.

[3] The vehicle of claim 2, wherein the conduit comprises an opening at the end thereof.

[4] The vehicle of claim 3, wherein the wireless remote control is configured to control an orientation of the opening.

[5] The vehicle of claim 4, wherein the vehicle further comprises a nozzle at the end of the conduit.

[6] The vehicle of claim 2, wherein the vehicle further comprises a nozzle at the end of the conduit.

[7] The vehicle of claim 1, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

[8] The vehicle of claim 1, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

[9] The vehicle of claim 8, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

[10] The vehicle of claim 4, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

[11] The vehicle of claim 10, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

[12] The vehicle of claim 4, wherein the power source is connected to the hydraulic pump by a mechanical drive and connected to the fluid pump by the mechanical drive.

[14] The vehicle of claim 13, wherein the ground engaging propulsion structure comprises a set of wheels.

[15] The vehicle of claim 14, wherein the set of wheels comprises at least two powered wheels.

[16] The vehicle of claim 14, wherein the set of wheels comprises four powered wheels, each wheel of the set of wheels is independently powered and is operable at variable speed.

[17] The vehicle of claim 16, wherein the wheels are operable at variable speed by the hydraulic motor.

[18] The vehicle of claim 17, wherein the vehicle further comprises a nozzle at the end of the conduit.

[19] The vehicle of claim 17, wherein the at least one of speed and direction of the vehicle when the vehicle is floating is controlled by a fluid mover.

[20] The vehicle of claim 17, further comprising a plurality of fluid nozzles fluidly connected to the fluid pump.

[21] The vehicle of claim 20, wherein the wireless remote control is configured to control the plurality of fluid nozzles to control the at least one of speed and direction of the vehicle when the vehicle is floating.

255. Claims 2-12 and 14-21 each depend from claim 1. I understand that 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.

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

XII. GROUND 6: CLAIMS 1-21 ARE ANTICIPATED BY LYSENG

257. I understand that other than by arguing that Lyseng is not prior art to the '425 Patent, neither Nuhn nor Mr. Prairie has substantively addressed the teachings of Lyseng and whether claims 1-21 would be anticipated by Lyseng if it were to be considered prior art. As stated in my prior declaration, it is my opinion that claims 1-21 are anticipated by Lyseng if Lyseng were deemed prior art to the '425 Patent. EX1004, Section XII.

XIII. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

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

258. Despite arguing that Nuhn's Lagoon Crawler commercial embodiments are commensurate in scope with the claims of the '425 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 '425 Patent. Rather, his analysis is limited to claim 1.

259. It is my opinion that the claims of the '425 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 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.

260. 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.

261. I understand that U.S. Patent Nos. 9,694,636, 10,124,638, 10,974,557, 11,491,835, 11,541,708 and the '425 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 '425 Patent. These features include, for example:

- A fluid pump comprising a pump housing for immersion within the fluid, the pump housing comprising a bottom fluid inlet and at least

two tangential fluid outlets ('636 Patent, claim 21; '638 Patent, claim 10)

- 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)

262. I also understand that Nuhn has filed for a motion to amend its patent claims in the present IPR, as well as 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).

263. 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 ’425 Patent does not claim features that Nuhn describes as “material” or essential to the synergy of the alleged invention, the ’425 Patent claims are not coextensive with the Lagoon Crawler.

264. 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 ’425 Patent claims.

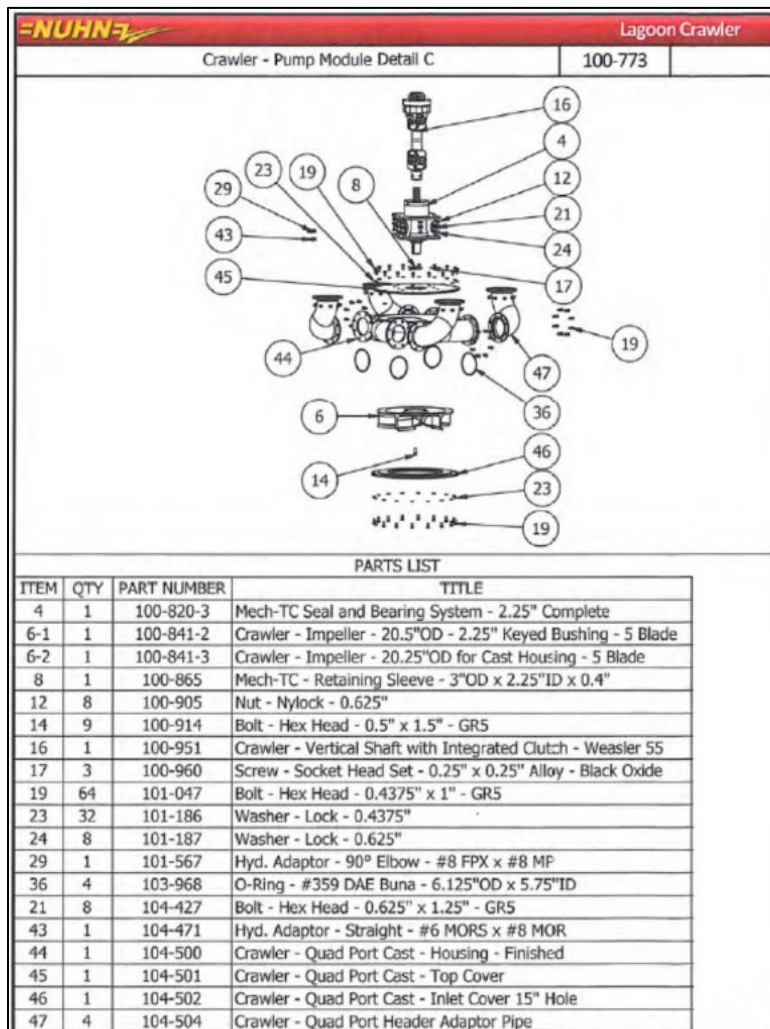
i. Nuhn’s Gen 1 Lagoon Crawler (MY2014-MY2017)

A fluid pump comprising a pump housing for immersion within the fluid, the pump housing comprising a bottom fluid inlet and at least two tangential fluid outlets (’636 Patent, claim 21; ’638 Patent, claim 10)

265. The Operator’s/Safety Manual for the MY2017 of the Gen 1 Lagoon Crawler describes a centrifugal pump with a “14” pump inlet” and “4 outlets off of

pump housing[.]” EX2036, 6. The manual further describes that the “[p]ump is submerged in lagoon so it will not lose its prime[.]” *Id.*

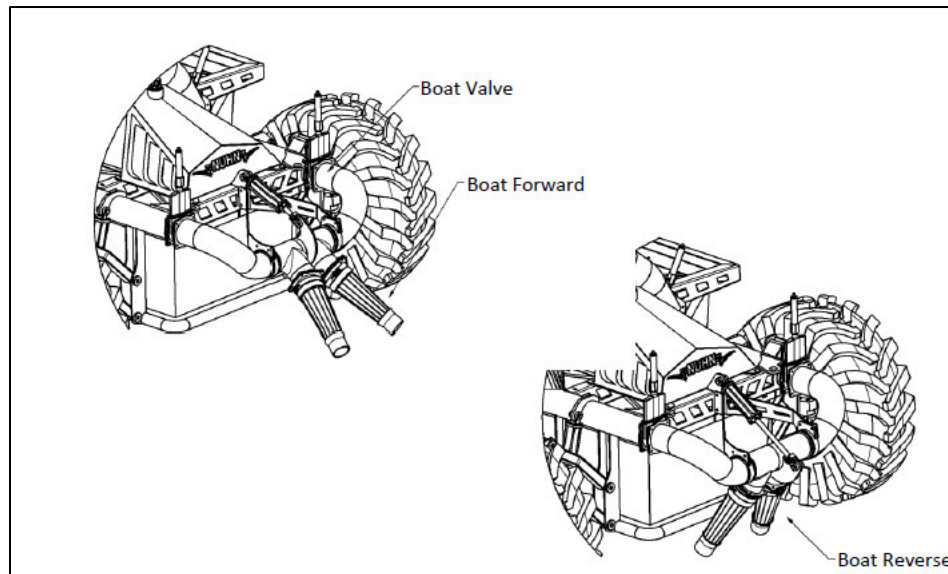
266. The parts catalog for Nuhn’s Gen 1 Lagoon Crawler shows that the pump includes a bottom fluid inlet.



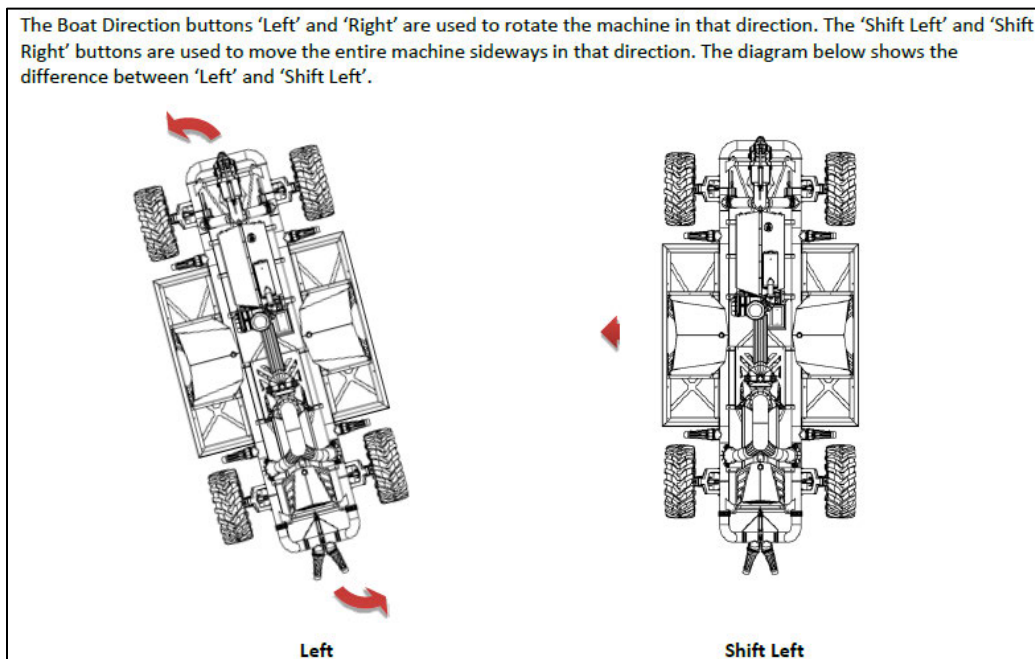
EX2037, 54.

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)

267. 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.



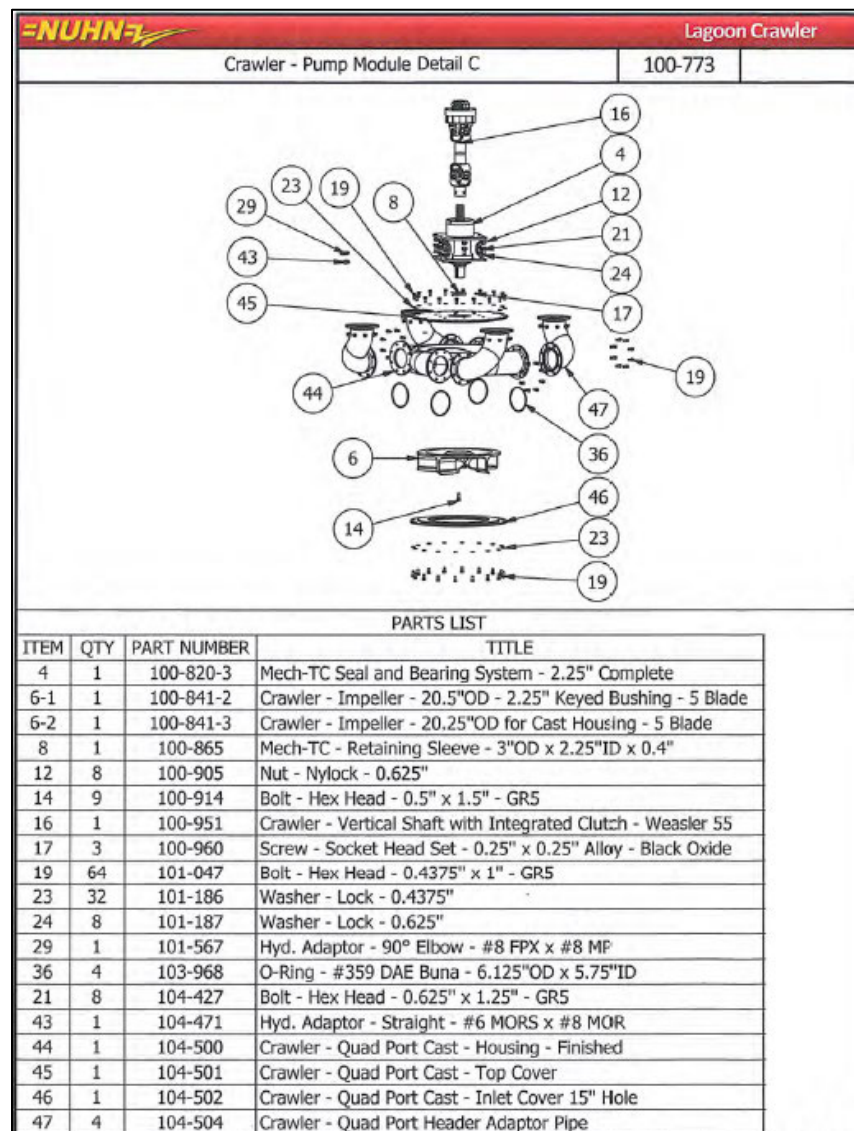
EX2036, 14.



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)

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



EX2037, 54.

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

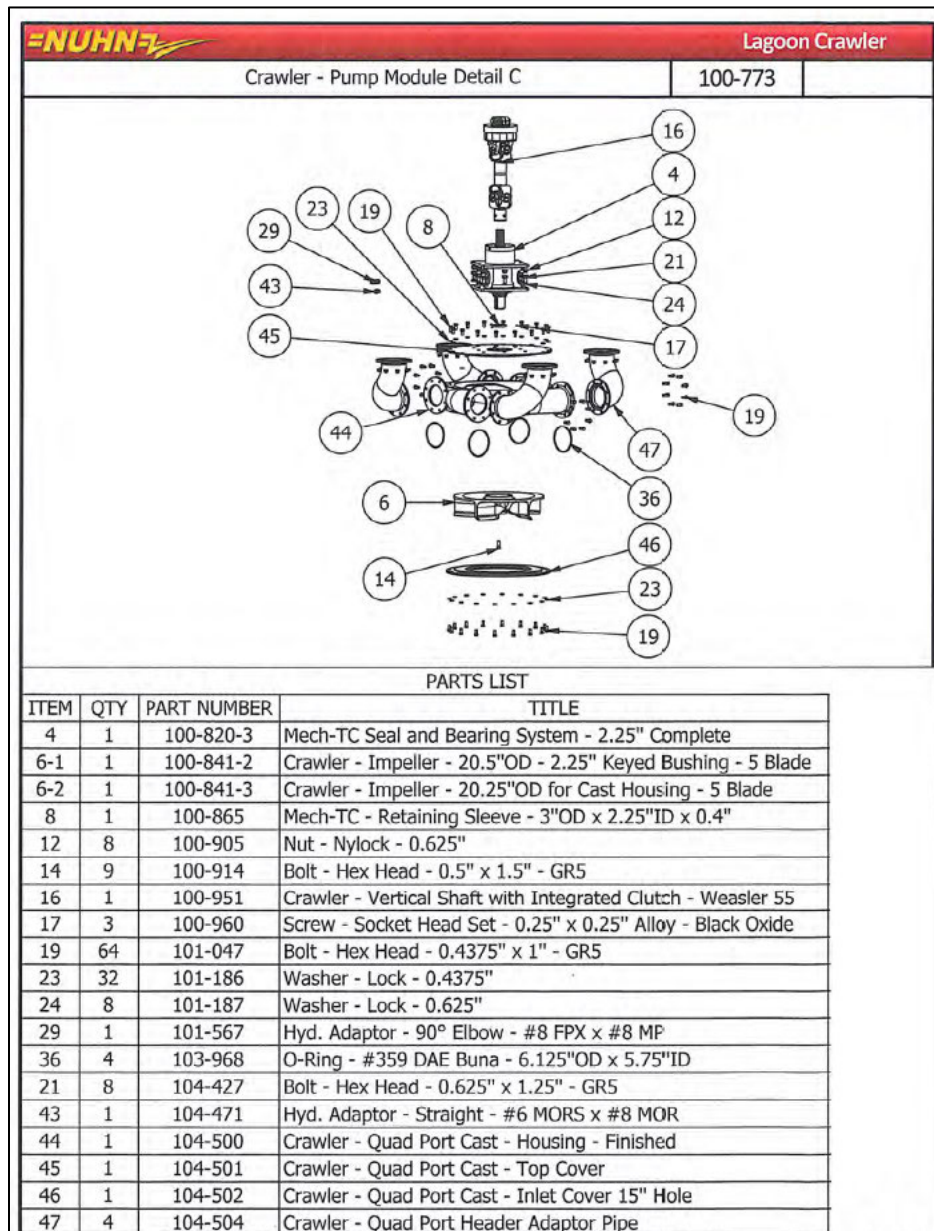
The immersible liquid manure pump of the liquid manure mover is positioned within liquid manure when the vehicle is floating ('835 Patent, substitute claim 41, 57, 79, 80)

270. 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.

271. 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)

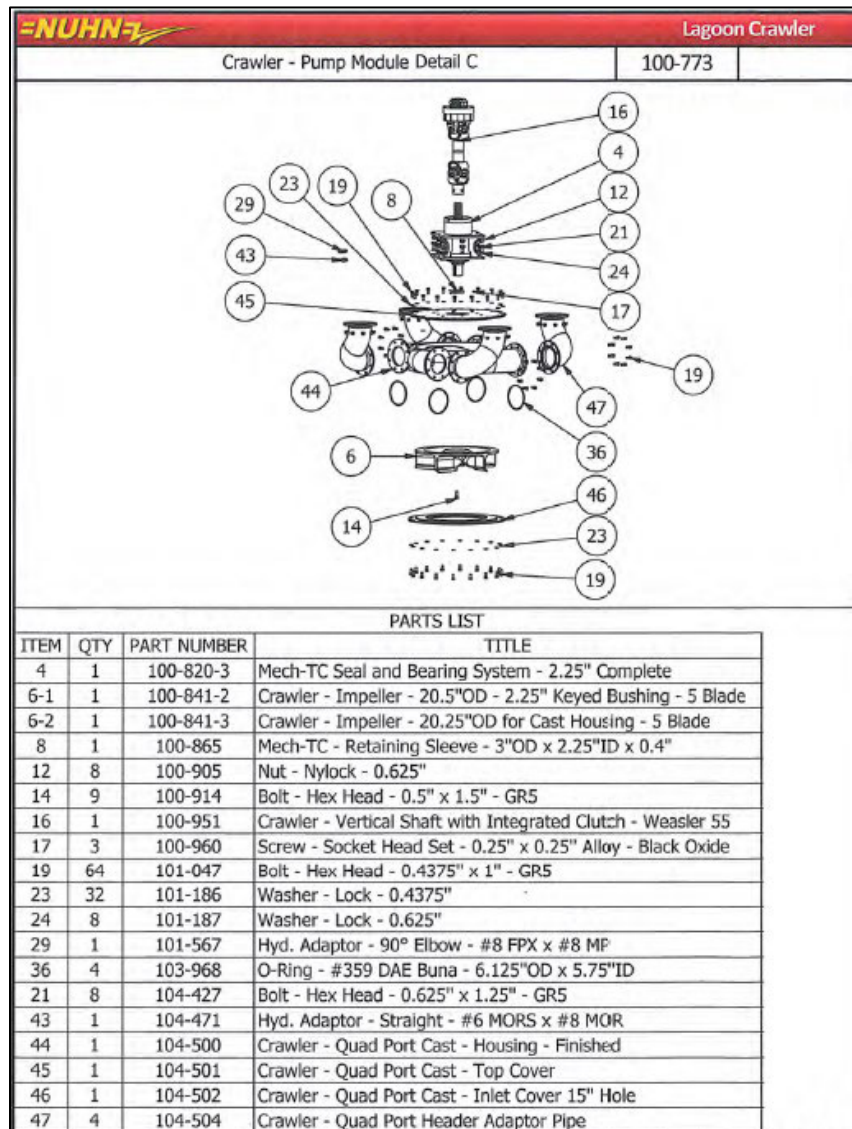
272. The parts catalog for the MY2014-MY2017 Gen 1 Lagoon Crawler shows a “[v]ertical [s]haft” that is connected to an impeller.



EX2037, 54.

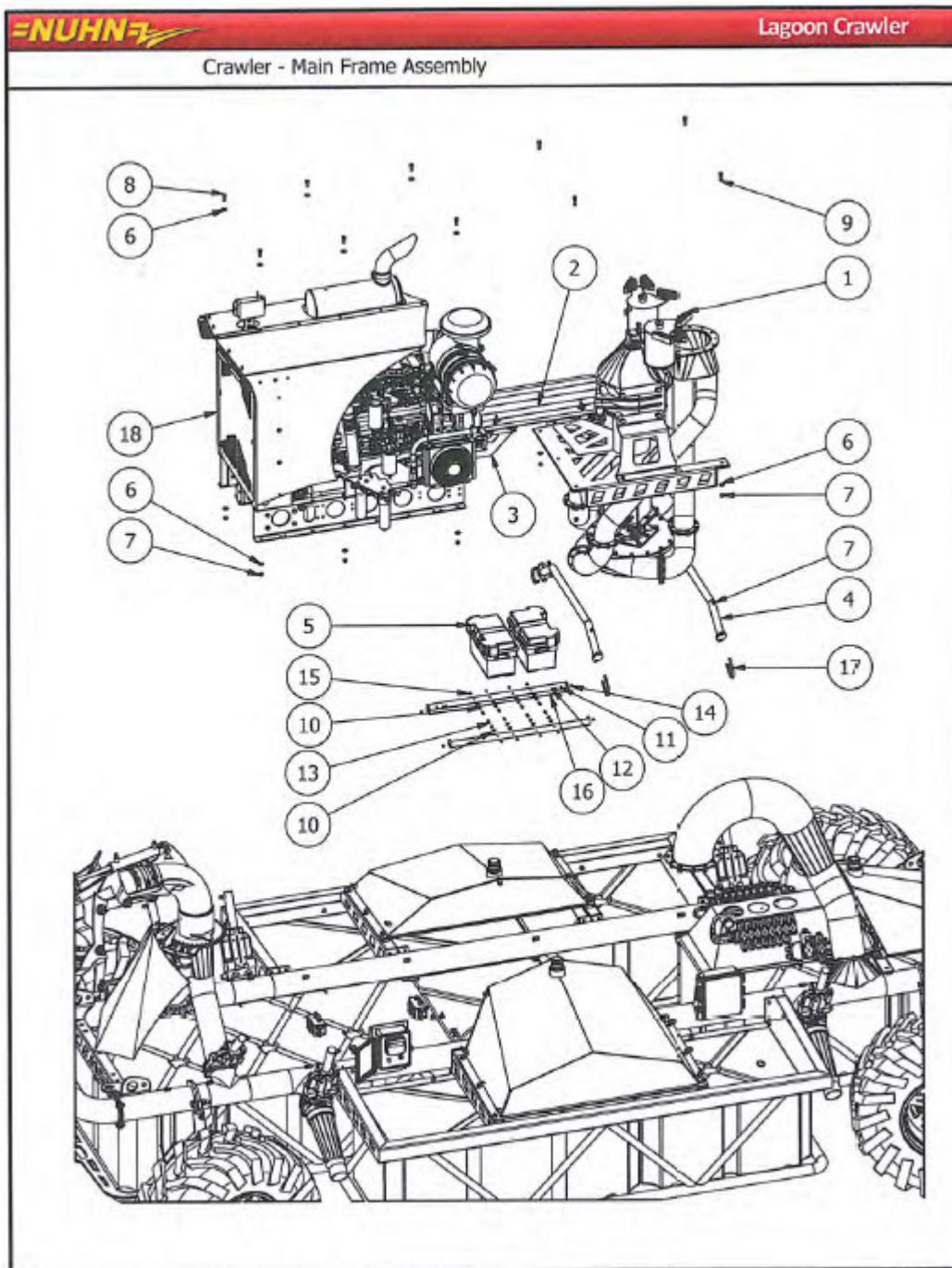
The immersible liquid manure pump of the liquid manure mover including a housing and the impeller located in a space between the four ground engaging wheels ('835 Patent, substitute claim 79)

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



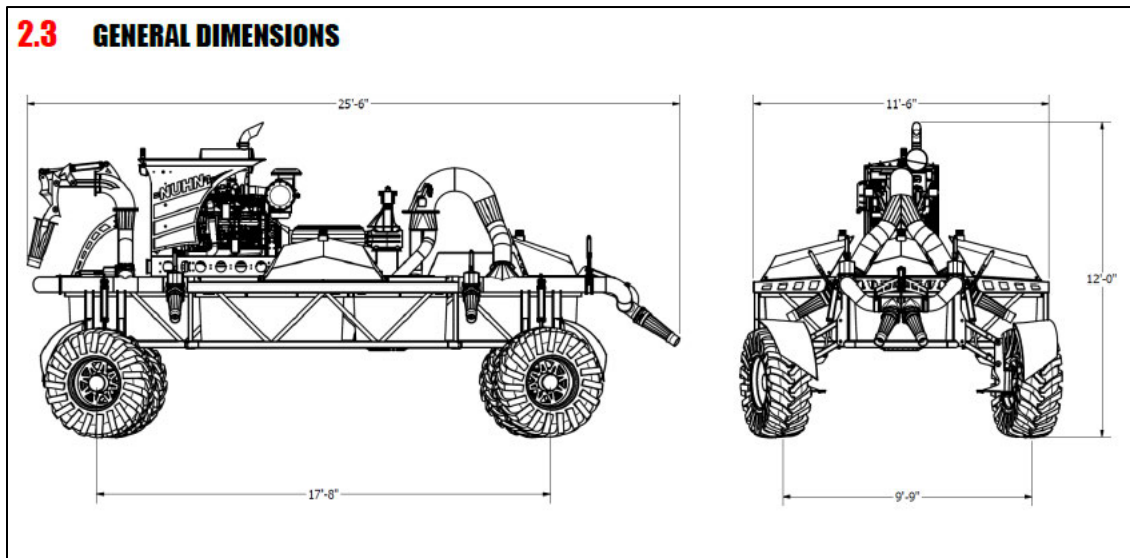
Id.

274. 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.

275. 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)

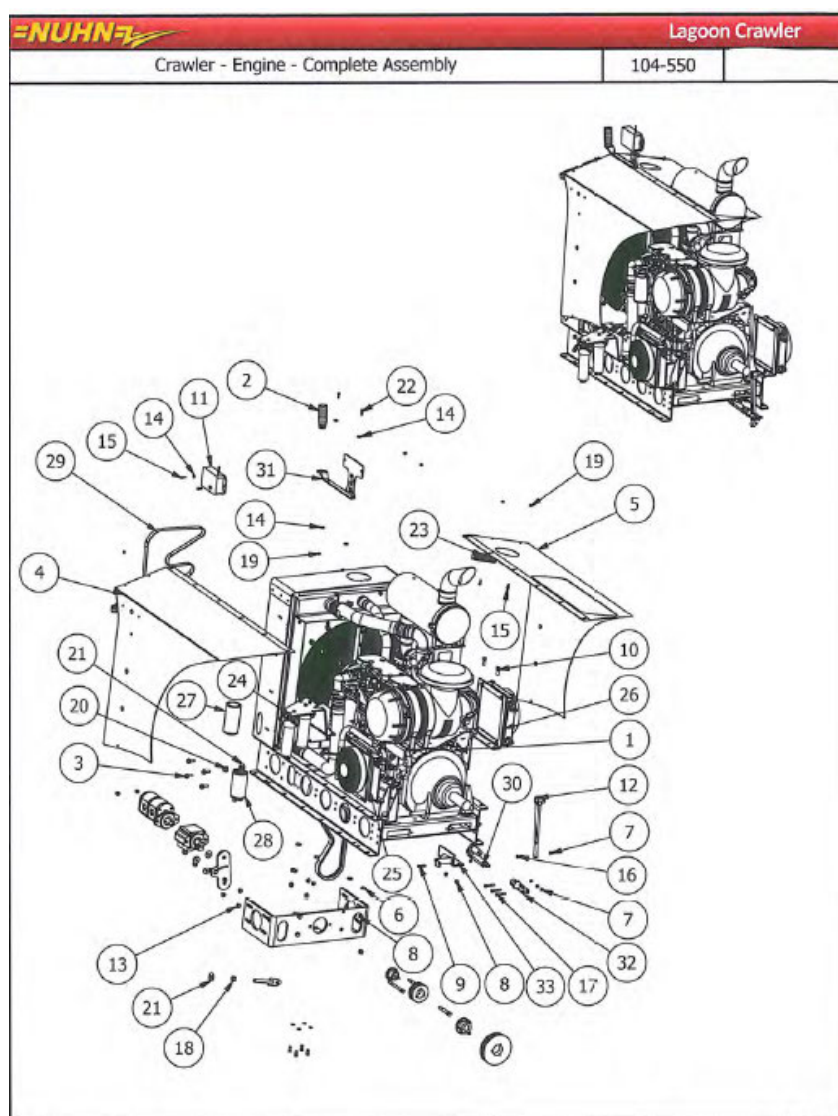
276. A brochure for the Gen 1 Lagoon Crawler illustrates a stream of manure propelled from a nozzle positioned above the floatable vehicle body.



EX2038, 1.

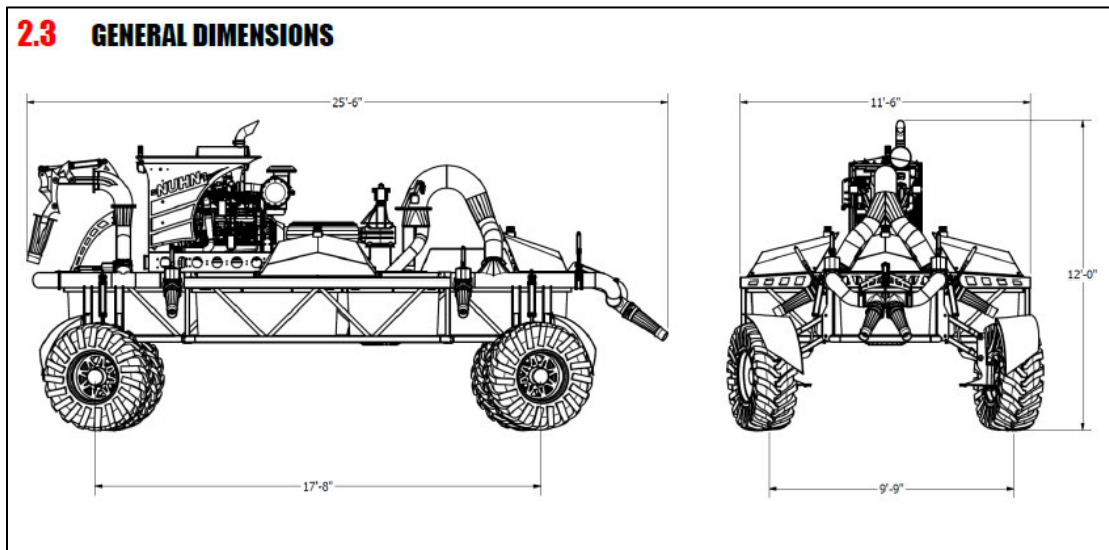
The at least one fluid nozzle is forward of the power source while the liquid manure pump is rearward of the power source ('835 Patent, substitute claim 41, 80)

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



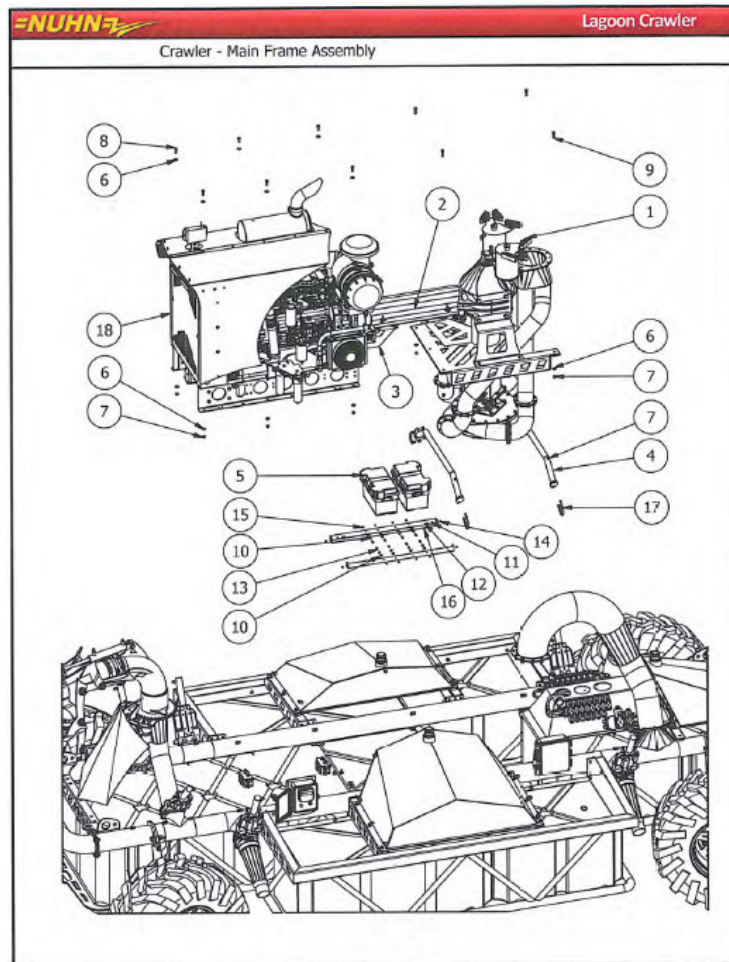
EX2037, 38.

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



EX2036, 5.

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



EX2036, 36.

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

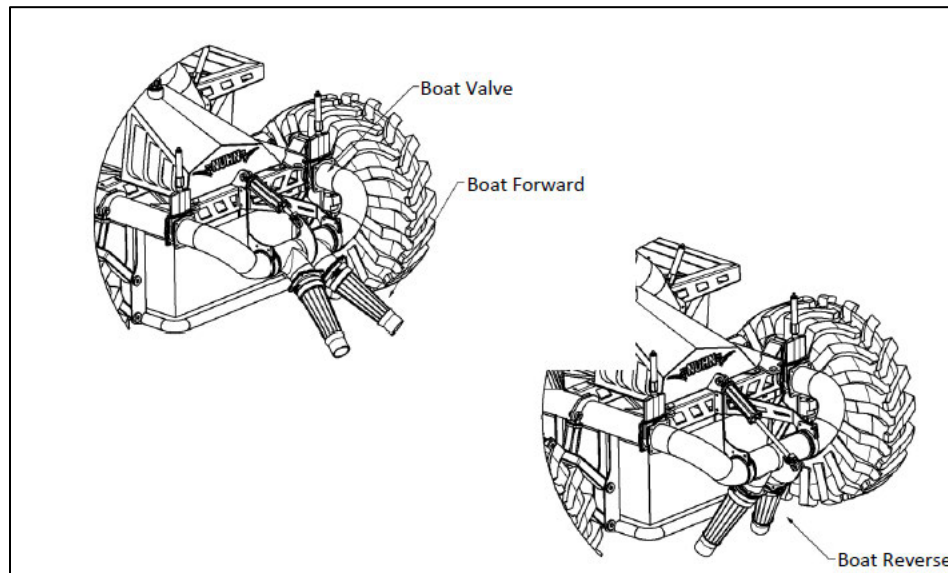
A fluid pump comprising a pump housing for immersion within the fluid, the pump housing comprising a bottom fluid inlet and at least two tangential fluid outlets ('636 Patent, claim 21; '638 Patent, claim 10)

280. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler describes a centrifugal pump with a "14" pump inlet" and "3 outlets off of pump housing[.]" EX2040 at 6.

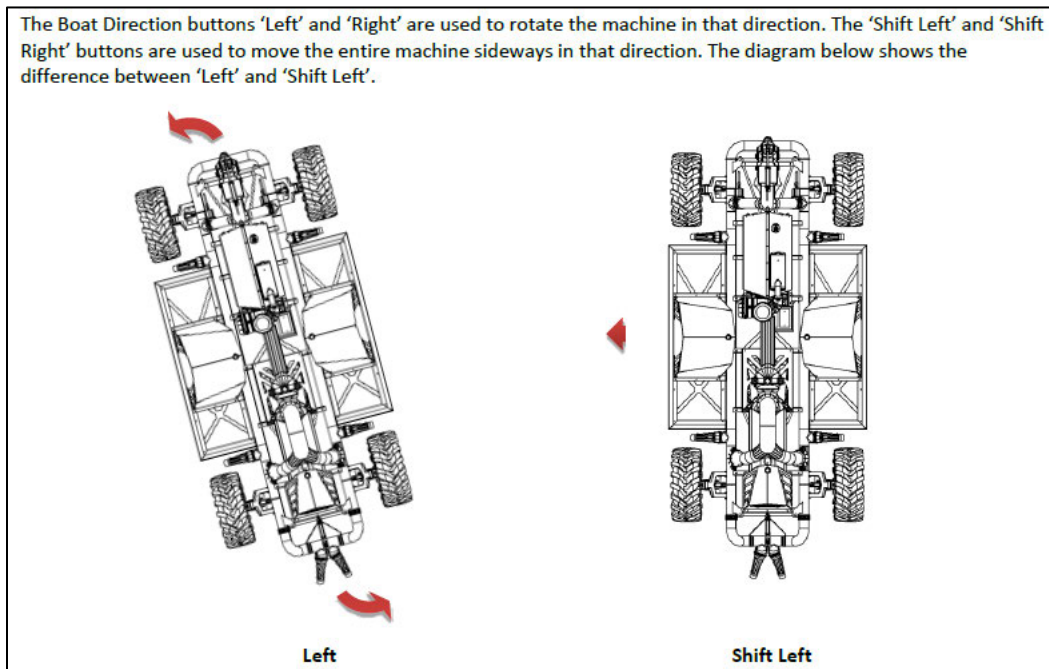
281. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler describes that it includes a pump that is "submerged in lagoon so it will not lose its prime[.]" *Id.*

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)

282. 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.



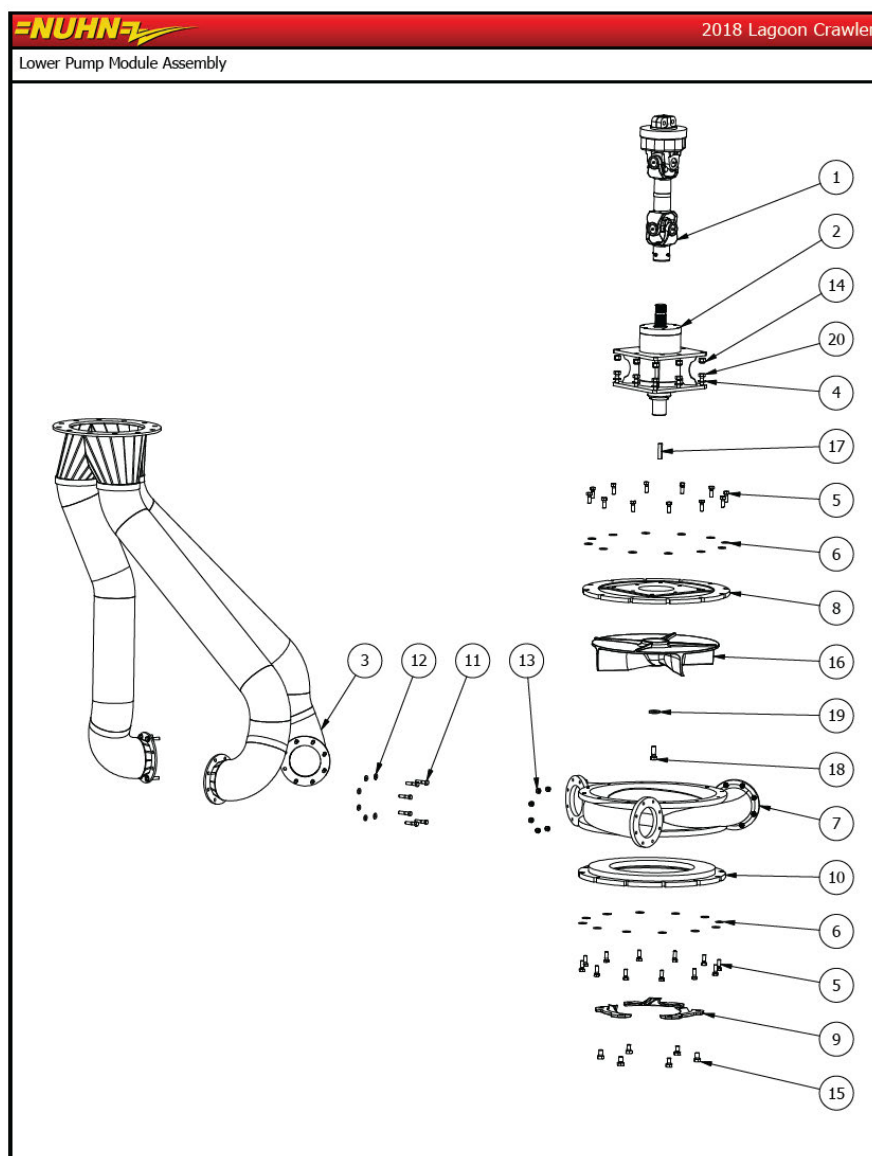
Id., 14.



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)

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

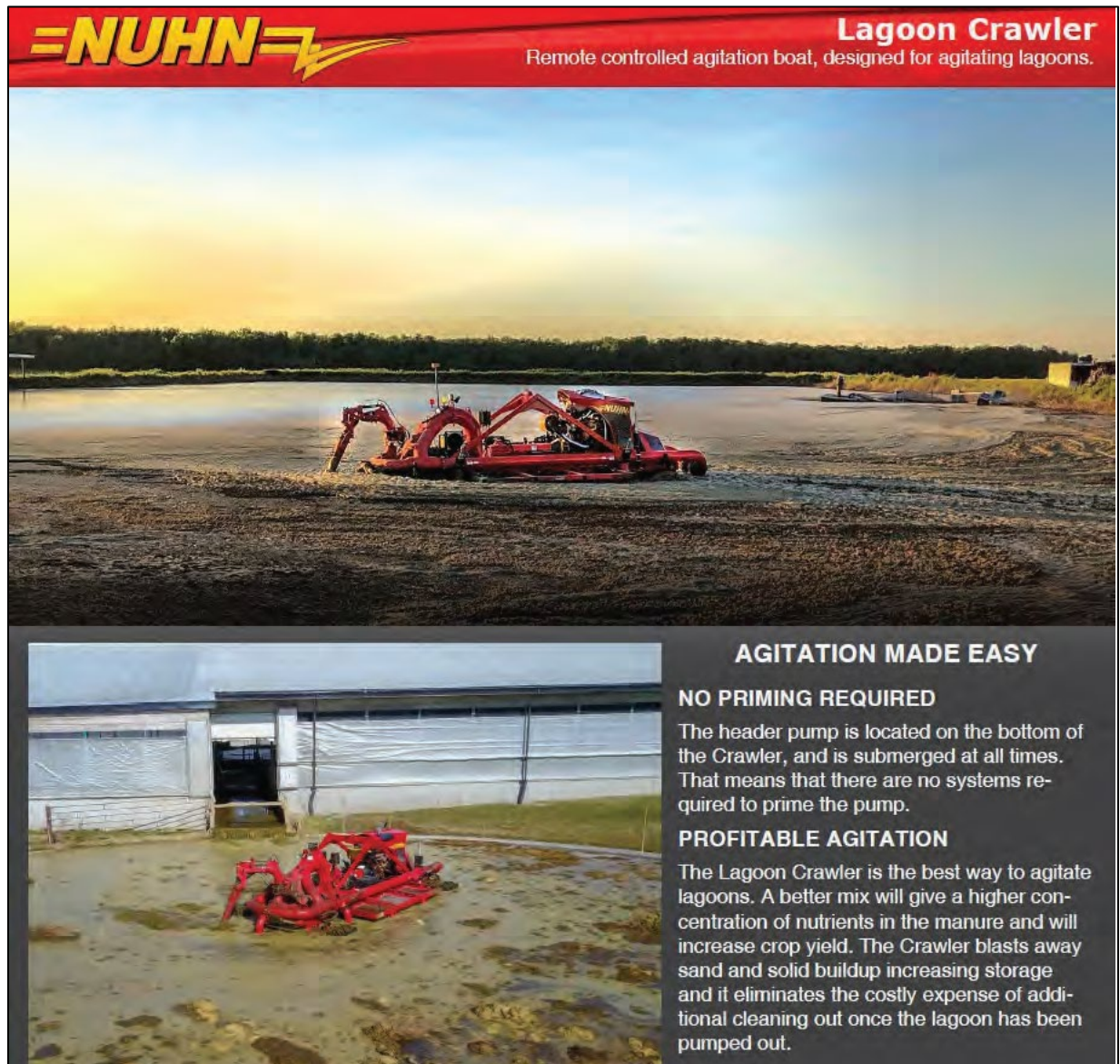


EX2041, 35.

=NUHN-7			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., 36.

284. A brochure for the Gen 2 Lagoon Crawler describes that the “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)

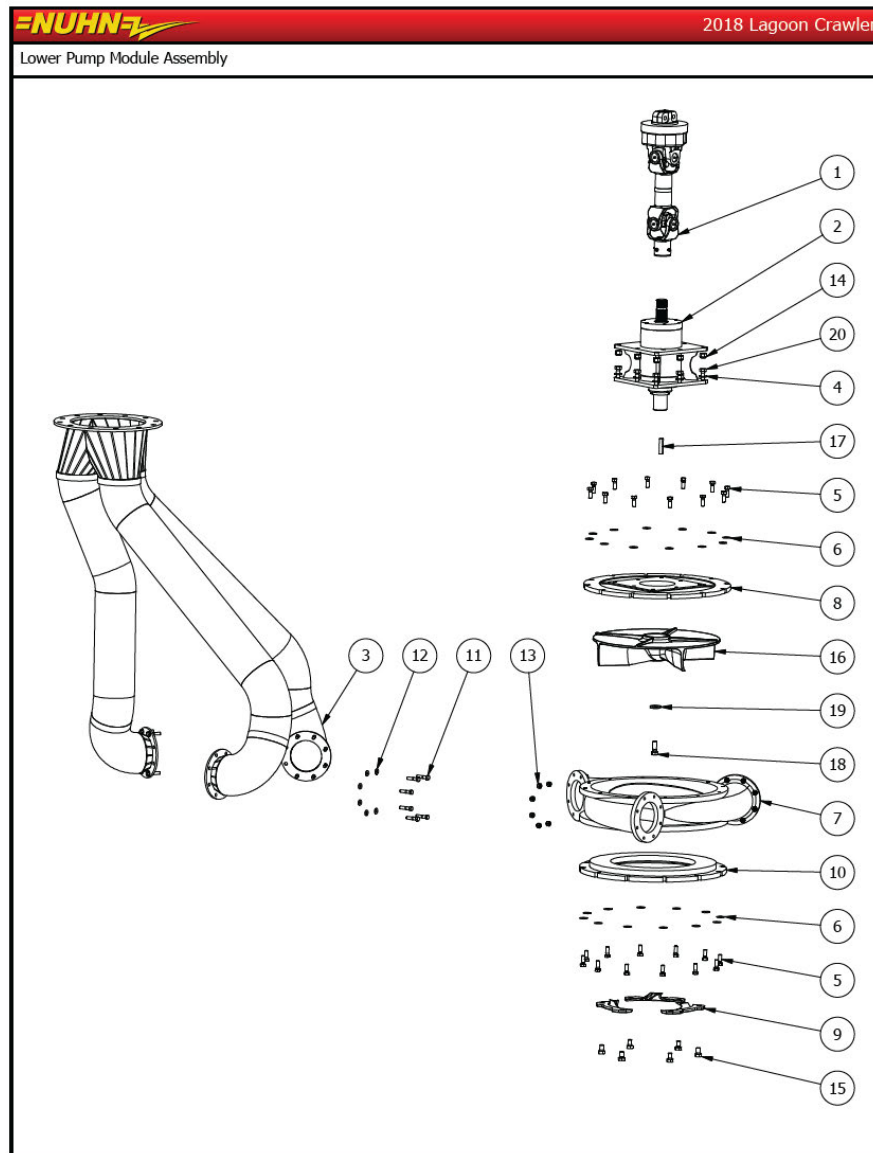
285. The Operator's/Safety Manual for the MY2019 of the Gen 2 Lagoon Crawler describes that it includes a pump that is "[s]pecifically designed for harsh

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

286. 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)

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



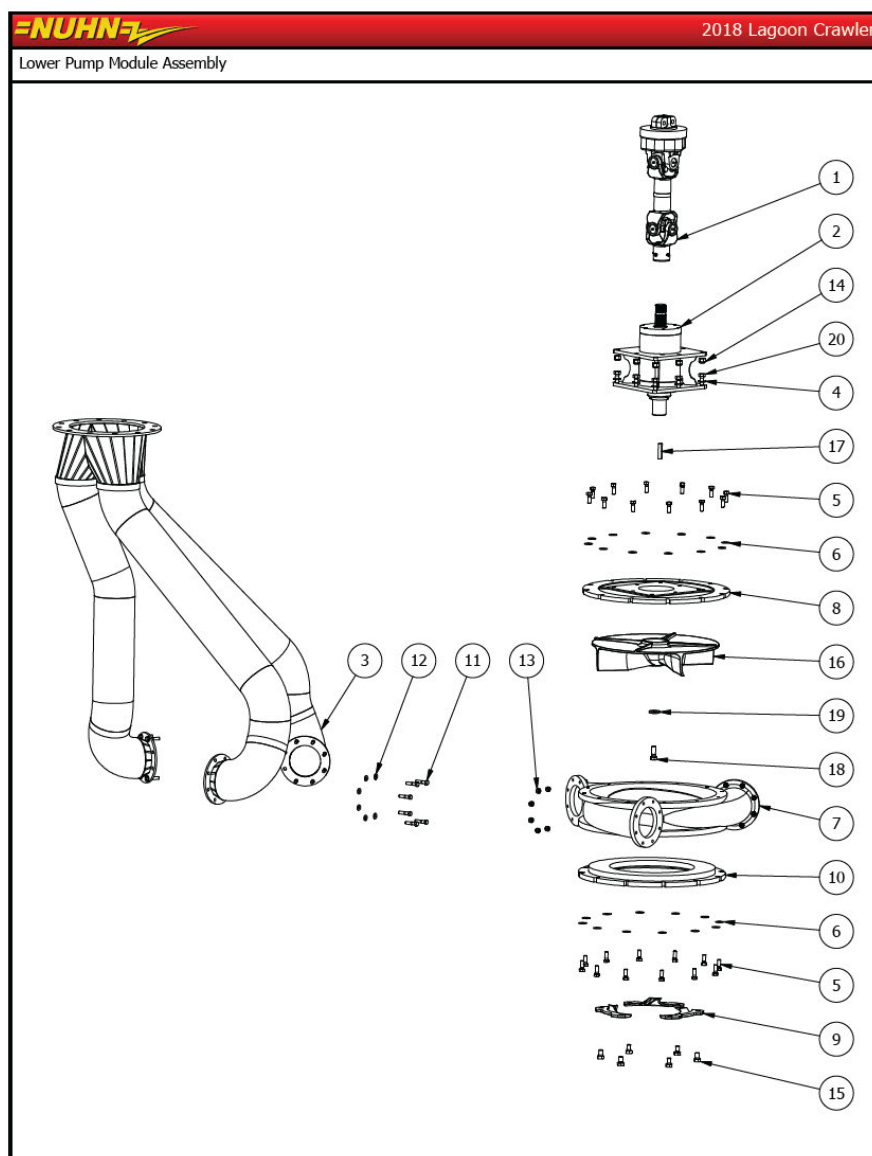
EX2041, 35.

=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., 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)

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

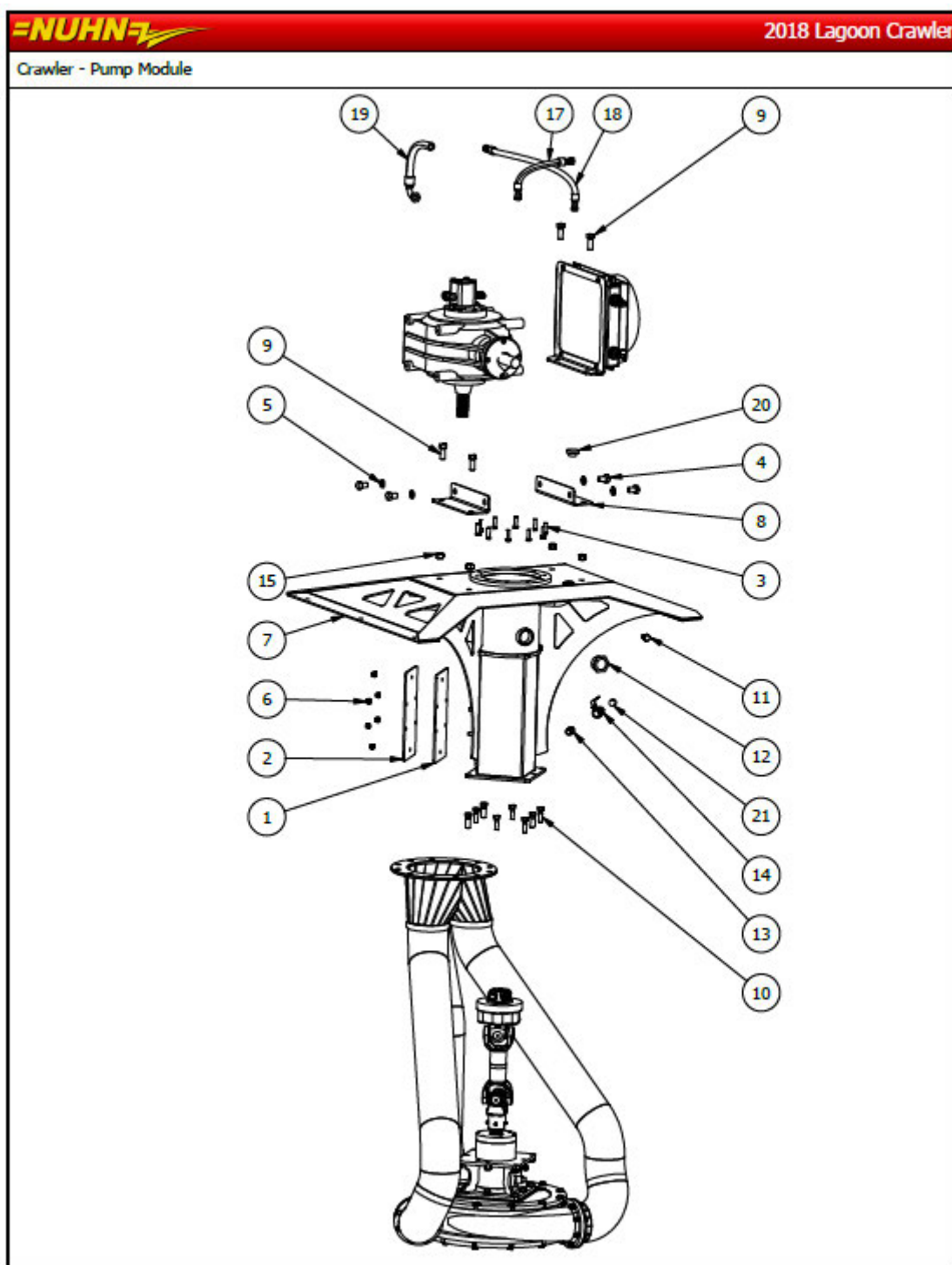


Id., 35.

=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

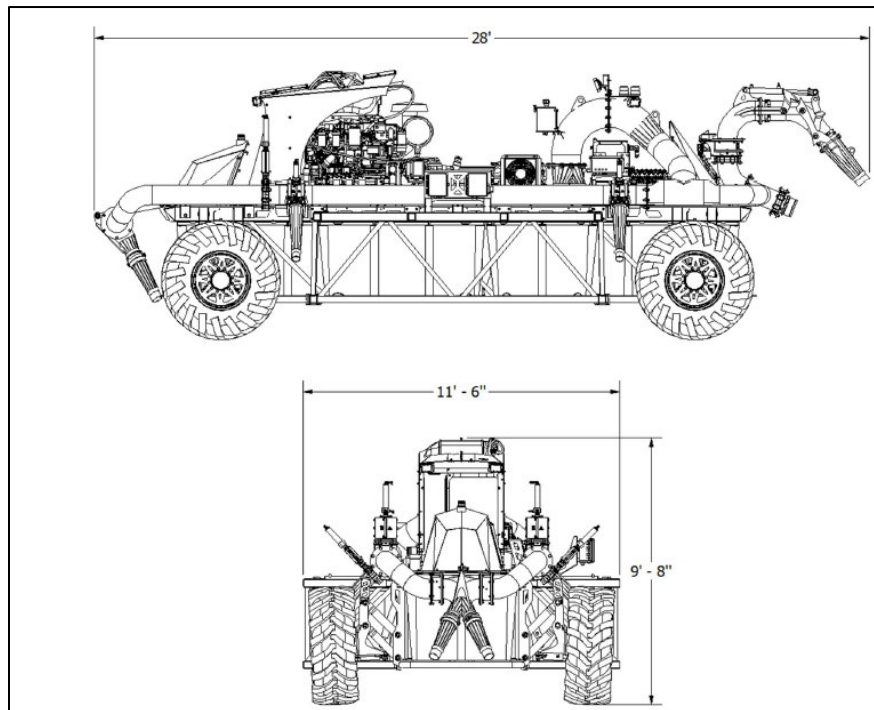
Id., 36.

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



Id., 30.

290. 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)

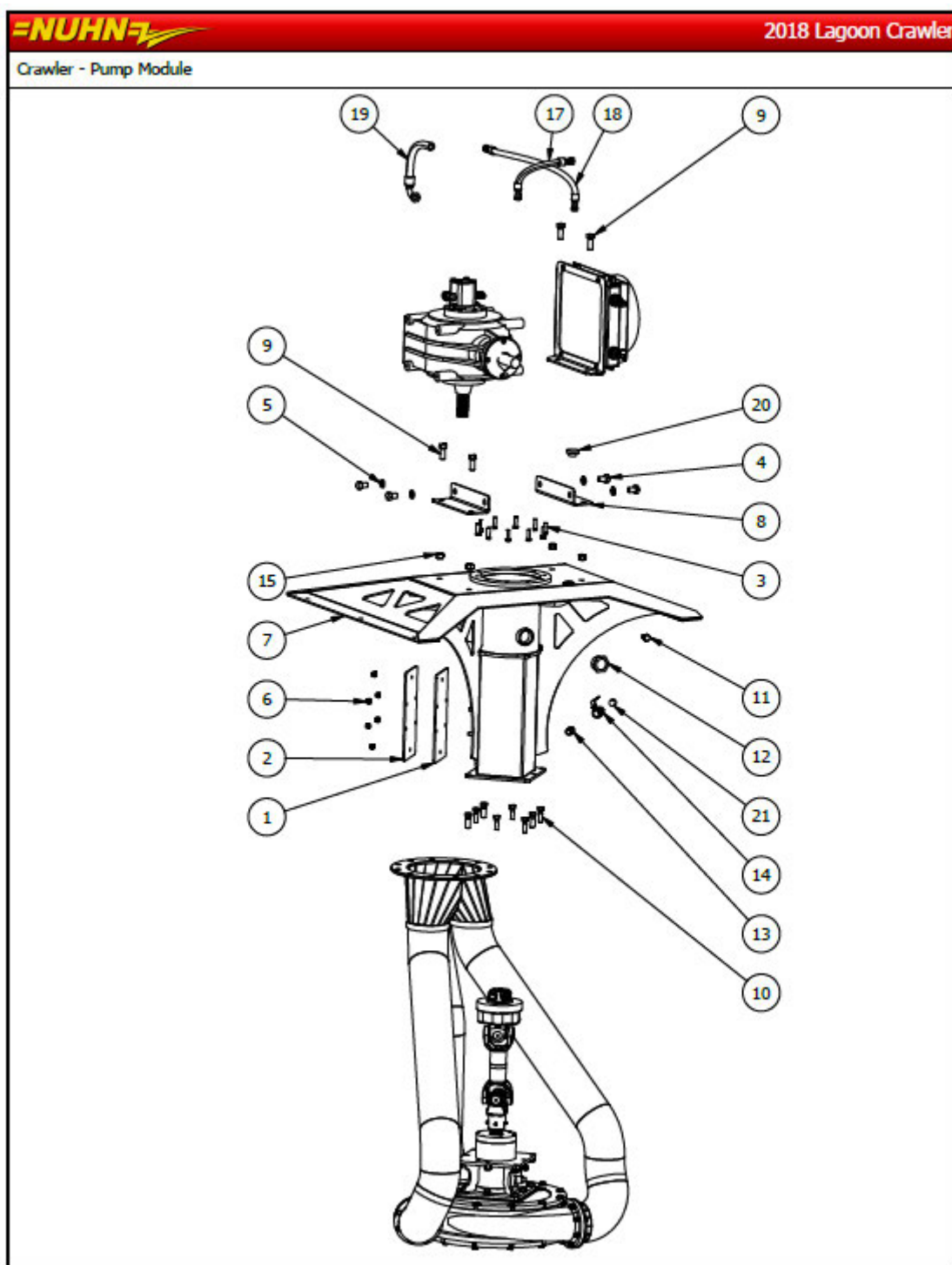
291. A brochure for the Gen 2 Lagoon Crawler illustrates a stream of manure propelled from a nozzle positioned above the floatable vehicle body.



EX2039, 2.

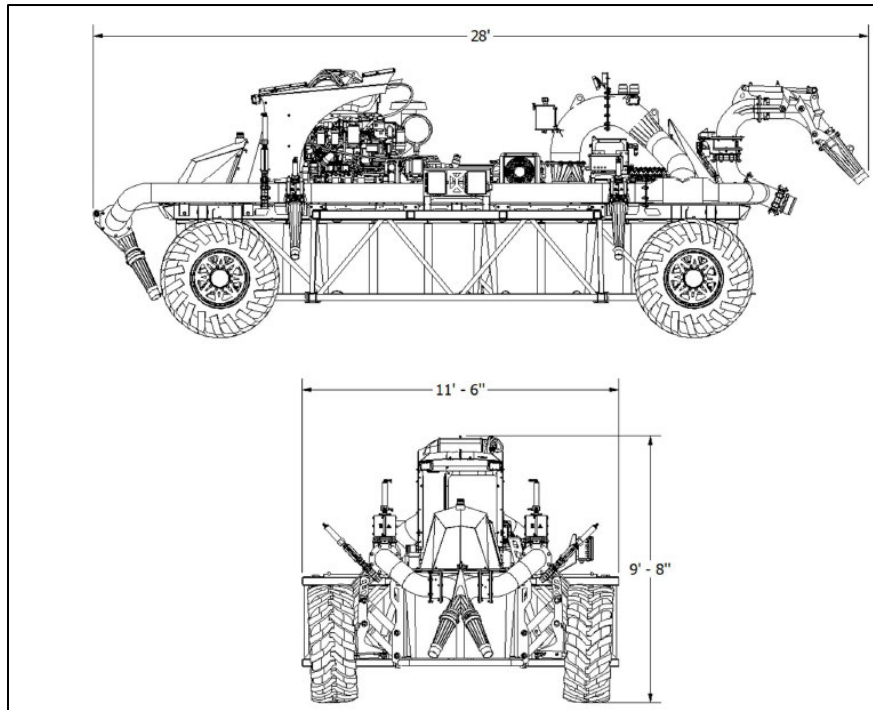
The at least one fluid nozzle is forward of the power source while the liquid manure pump is rearward of the power source ('835 Patent, substitute claim 41, 80)

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



EX2041, 30.

293. 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 fluid pump comprising a pump housing for immersion within the fluid, the pump housing comprising a bottom fluid inlet and at least two tangential fluid outlets ('636 Patent, claim 21; '638 Patent, claim 10)

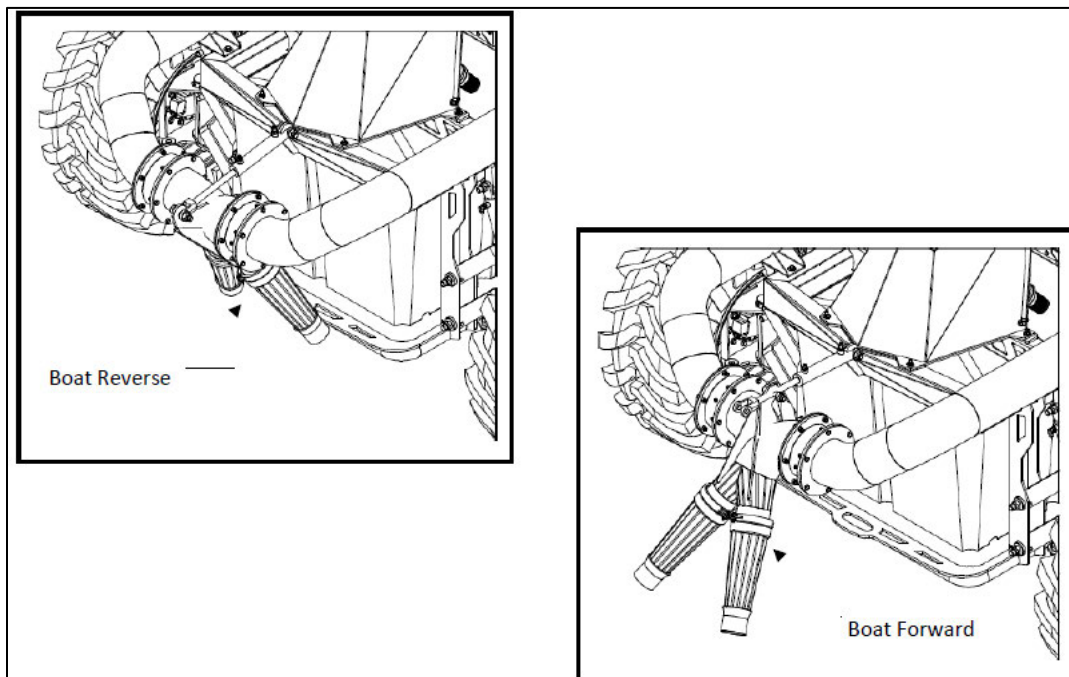
294. A brochure for the Gen 3 Lagoon Crawler describes that the "header pump is ... submerged at all times." EX2043, 1.

295. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes a centrifugal pump with a "14" pump inlet" and "3 outlets off of pump housing[.]" EX2044, 6.

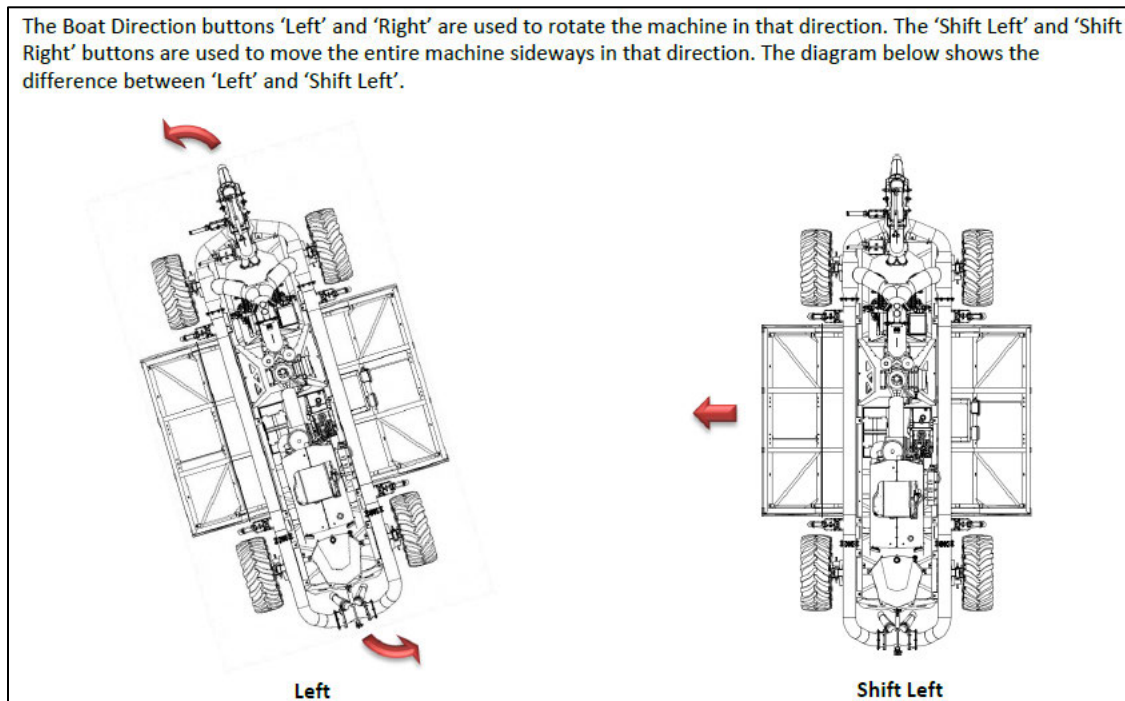
A valve structure in the fluid conduit, the plurality of fluid nozzles and the valve structure co-operating to provide directional control and motive power for the vehicle when floating ('638 Patent, claim 1; '638 Patent, claim 10)

296. 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. *Id.*, 9.

297. 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.



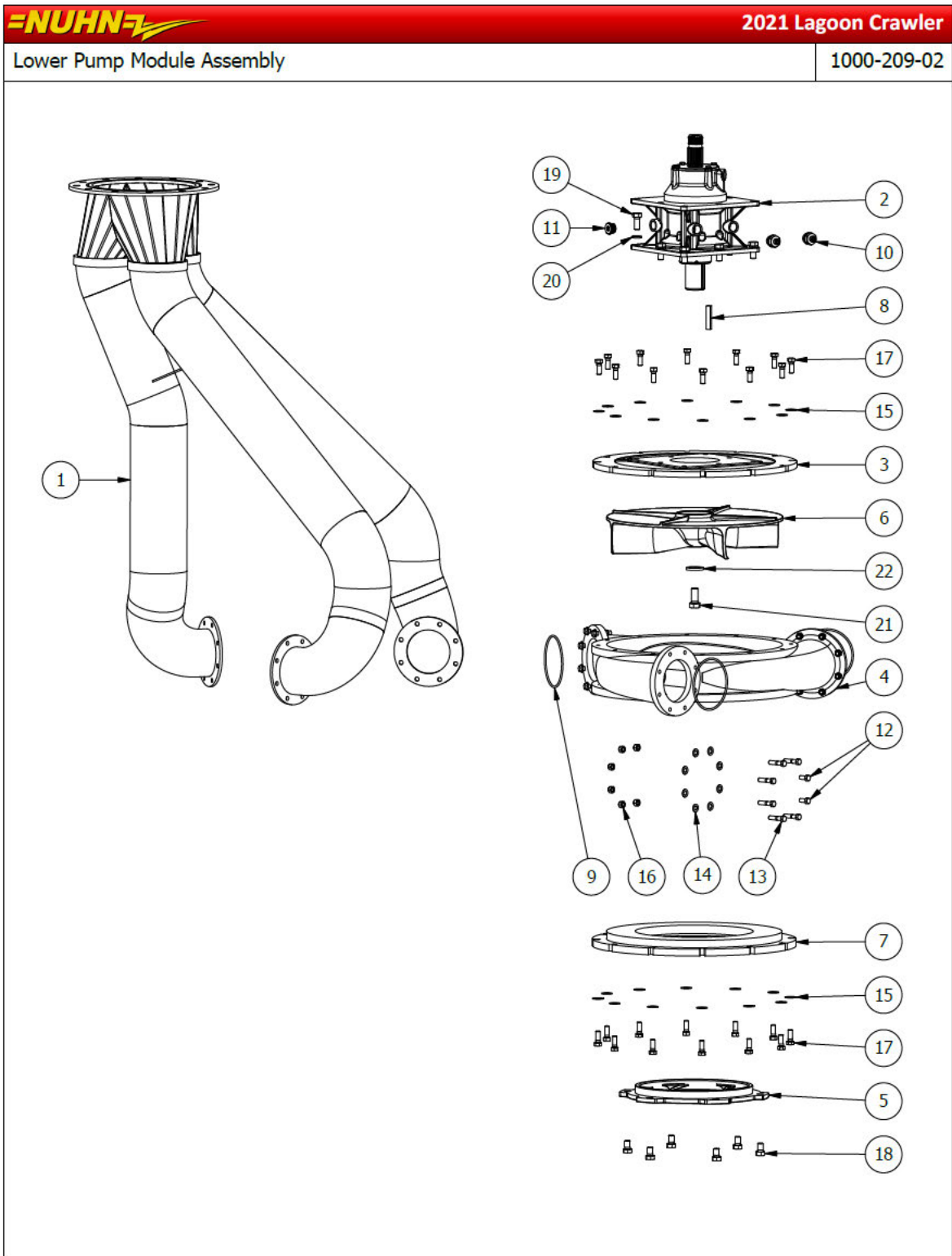
Id., 28.



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)

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



EX2045, 35.

<

Id., 36.

299. A brochure for the Gen 3 Lagoon Crawler describes that the “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.

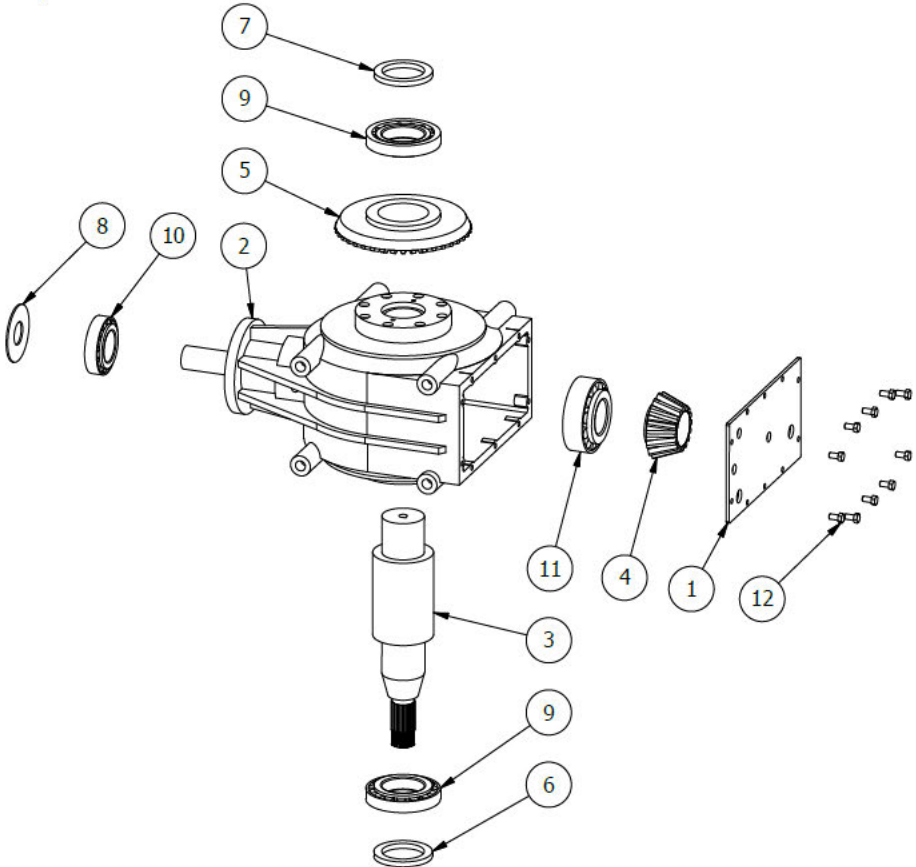
Id.

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)

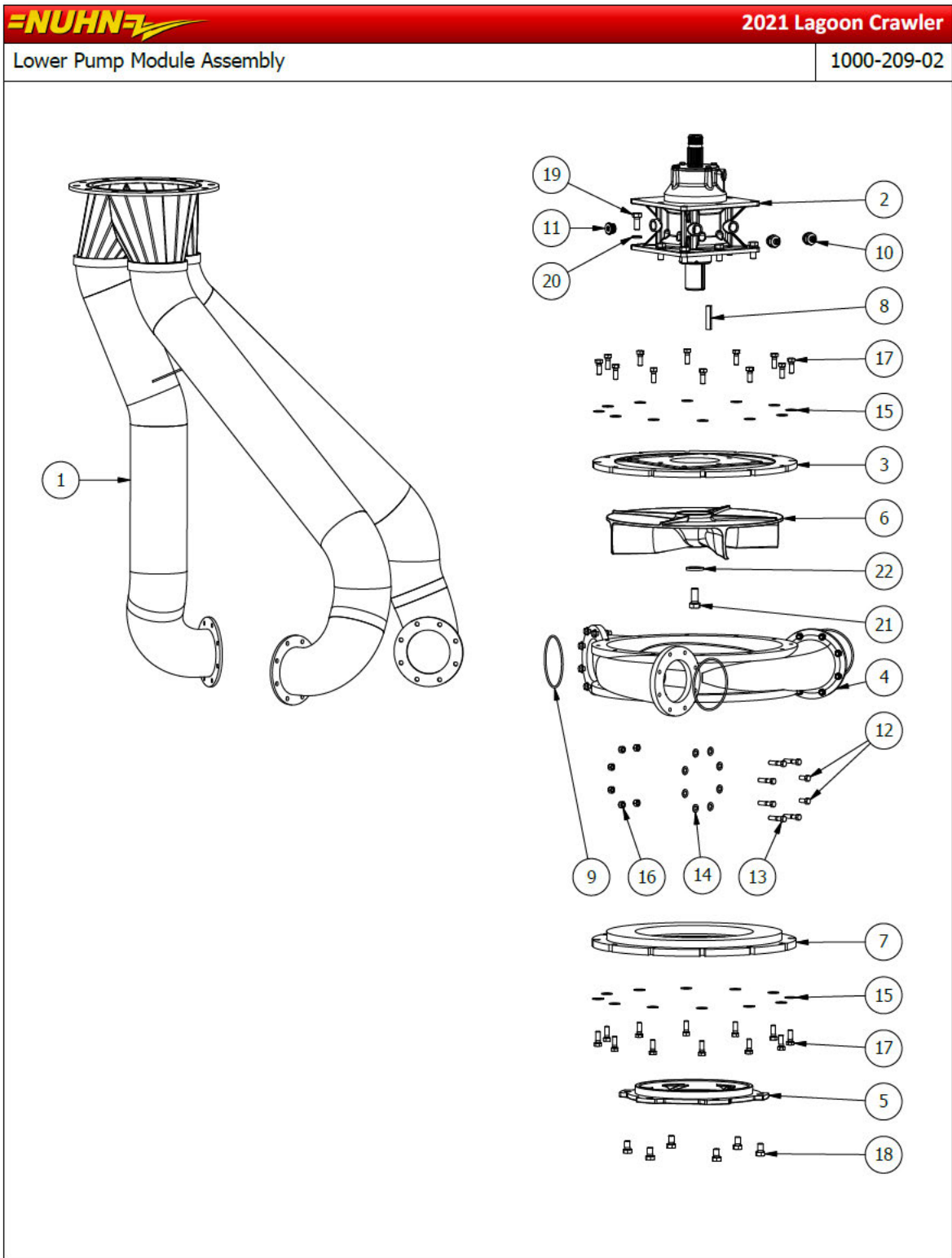
300. The Operator's/Safety Manual for the MY2020 of the Gen 3 Lagoon Crawler describes that it includes a pump that is "[s]pecifically designed for harsh lagoon environment" with a "[p]ump [that] is submerged in lagoon so it will not lose its prime[.]" EX2040, 6.

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)

301. 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	

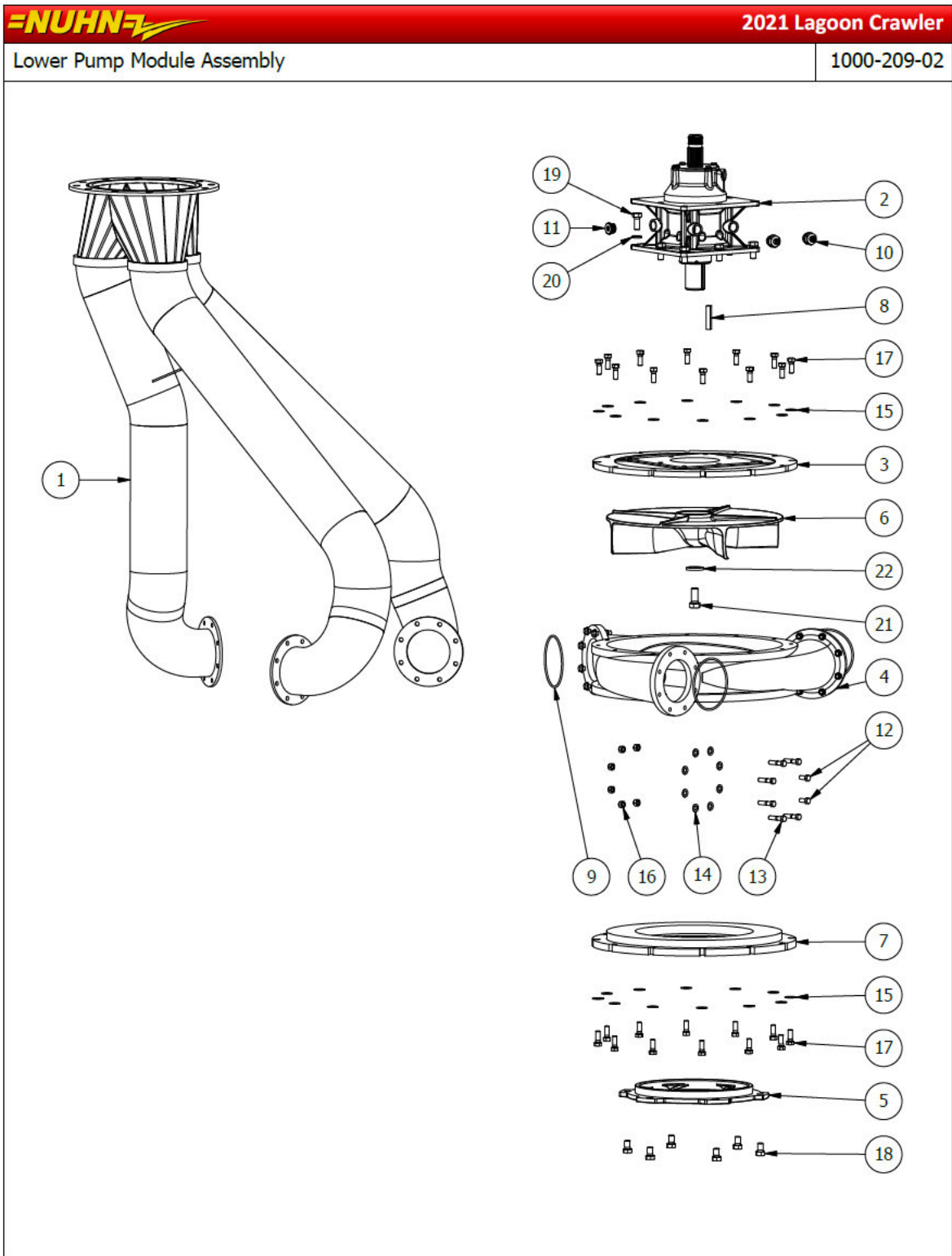
EX2045, 34.



Id., 35.

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)

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



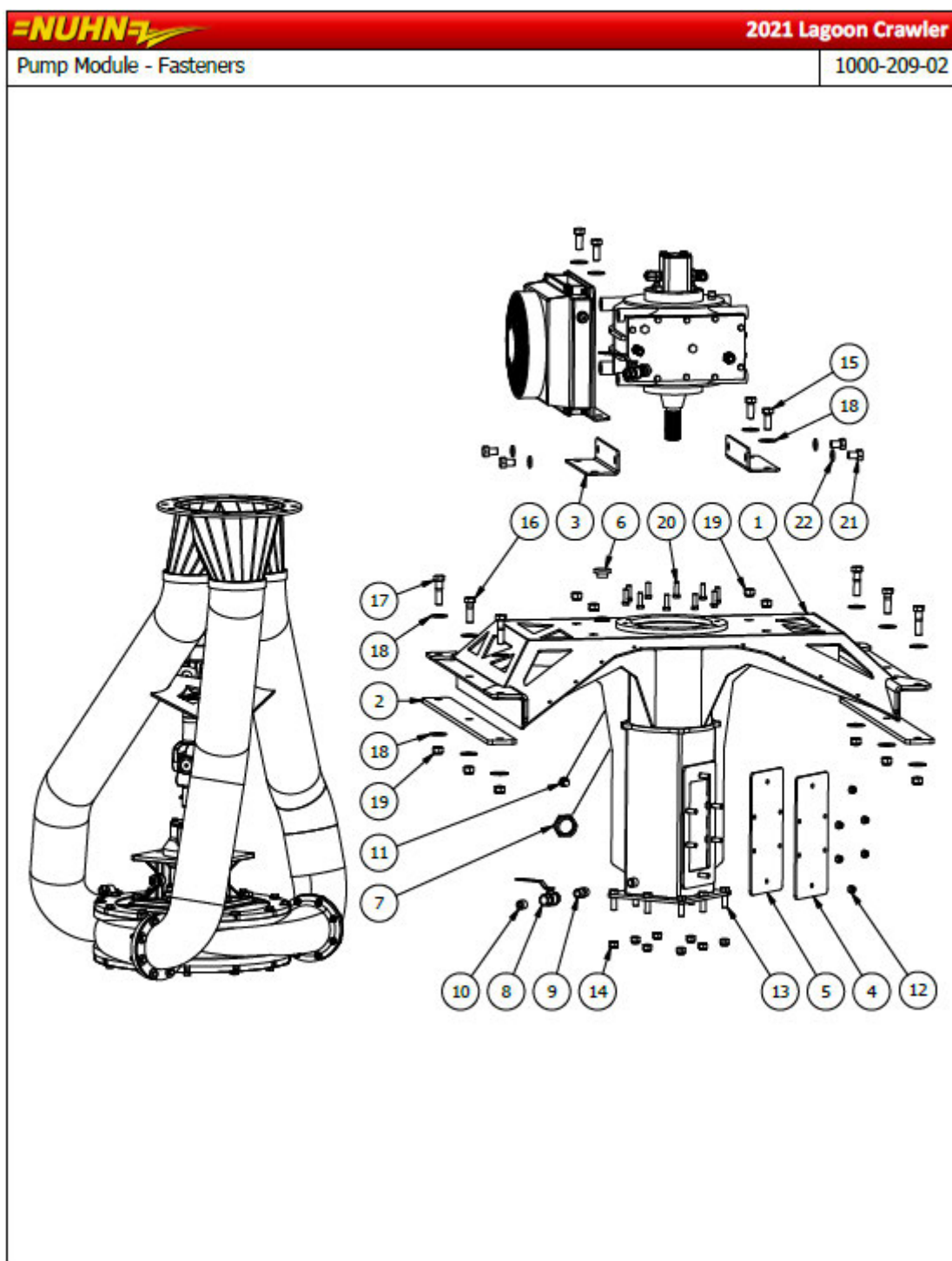
Id.

=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., 36.

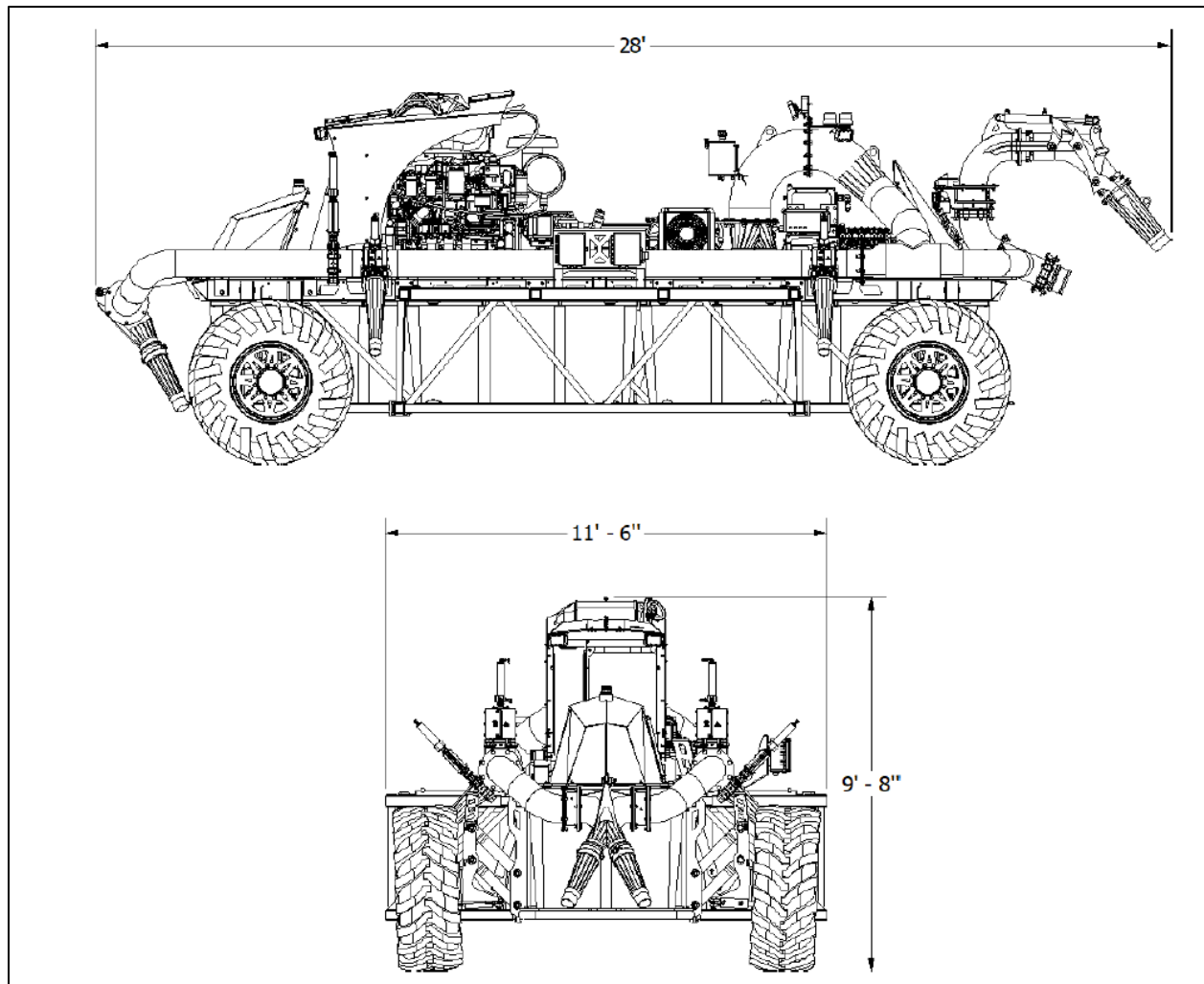
303. A brochure for the Gen 3 Lagoon Crawler states that the pump is “submerged at all times.” EX2043, 1.

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



EX2045, 32.

305. 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.



EX2043, 2.

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)

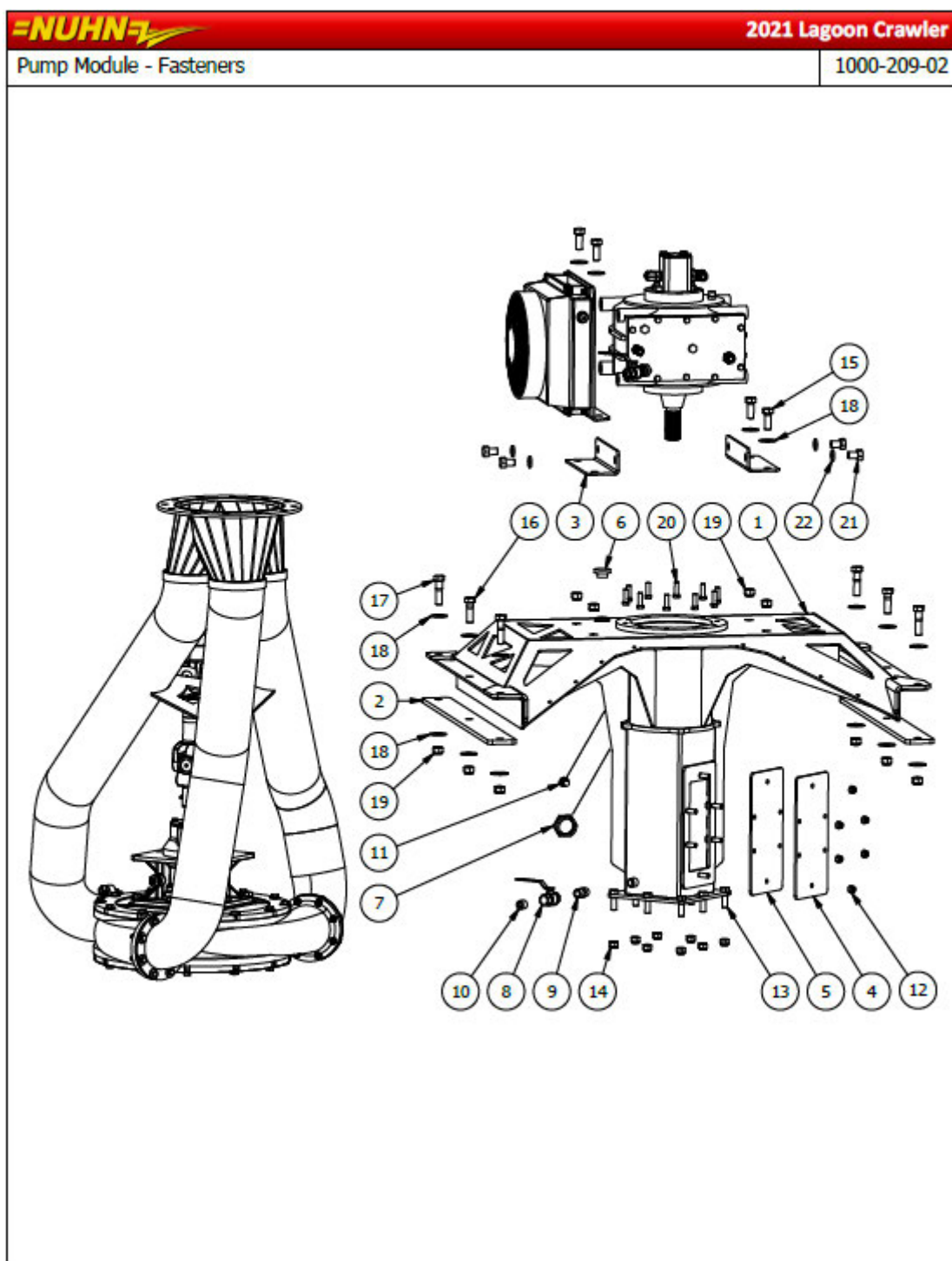
306. A brochure for the Gen 3 Lagoon Crawler illustrates a stream of manure propelled from a nozzle positioned above the floatable vehicle body.



Id.

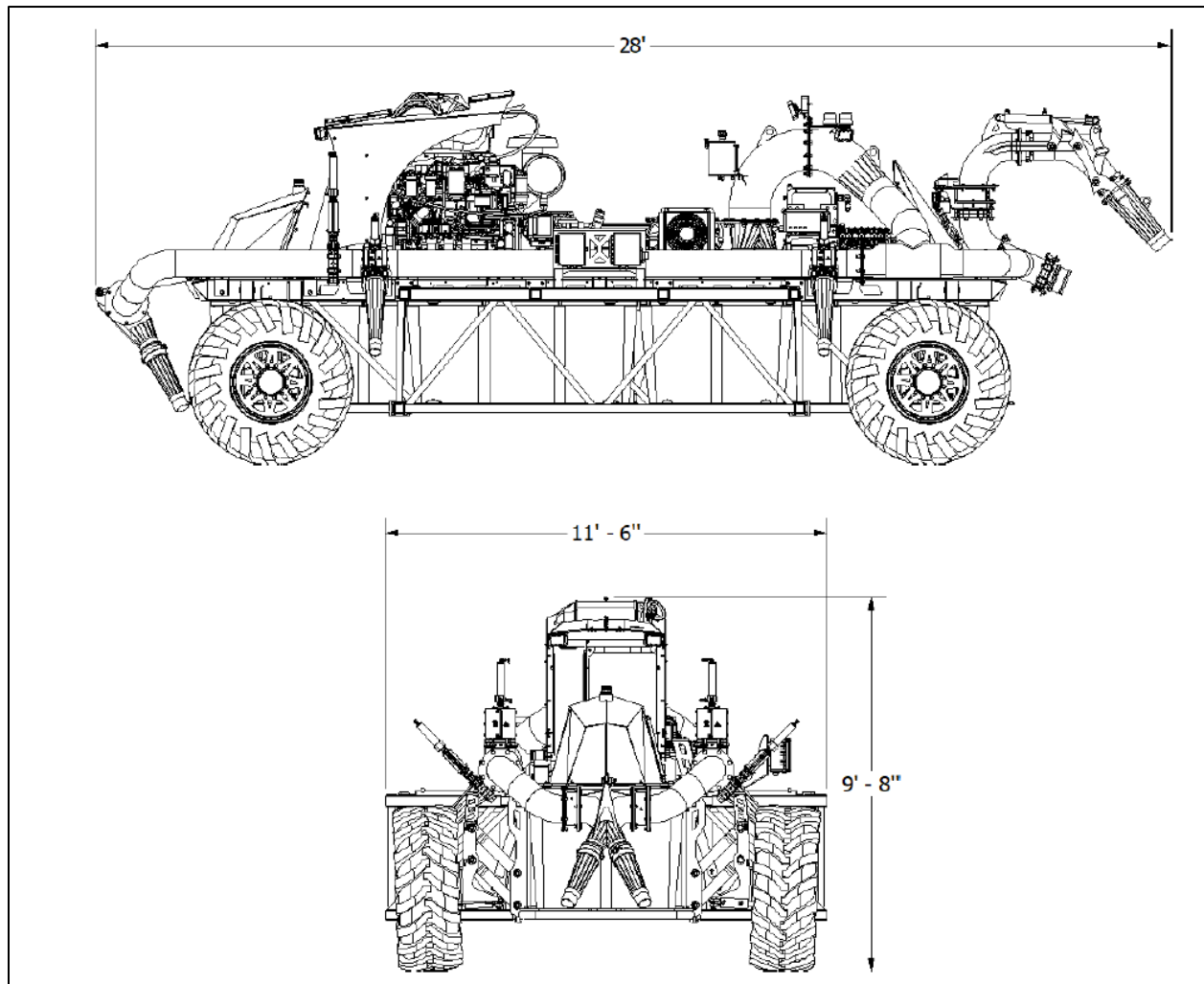
The at least one fluid nozzle is forward of the power source while the liquid manure pump is rearward of the power source ('835 Patent, substitute claim 41, 80)

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



EX2045, 32.

308. 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.

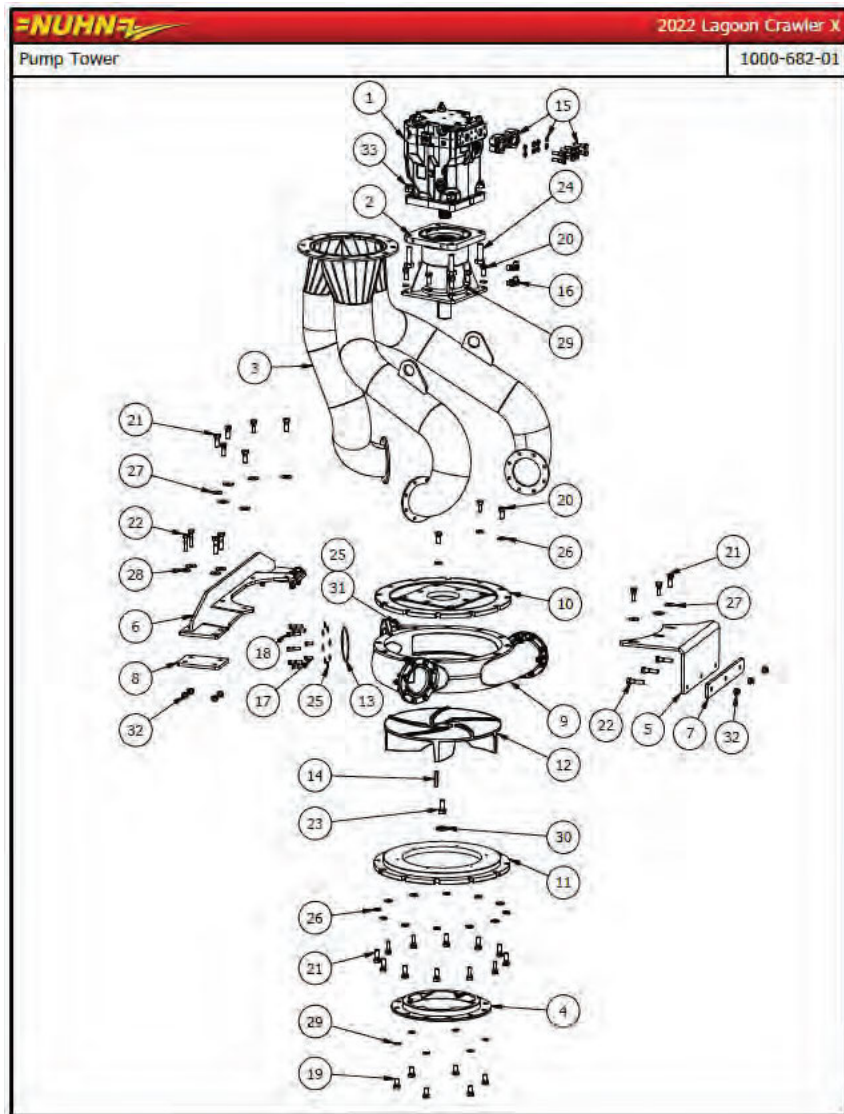


EX2043, 2.

iv. Nuhn's Crawler X

A fluid pump comprising a pump housing for immersion within the fluid, the pump housing comprising a bottom fluid inlet and at least two tangential fluid outlets ('636 Patent, claim 21; '638 Patent, claim 10)

309. The parts catalog for the 2022 Lagoon Crawler X illustrates a pump tower comprising a pump housing, an inlet chopper, a triple port having three outlets, and an impeller.

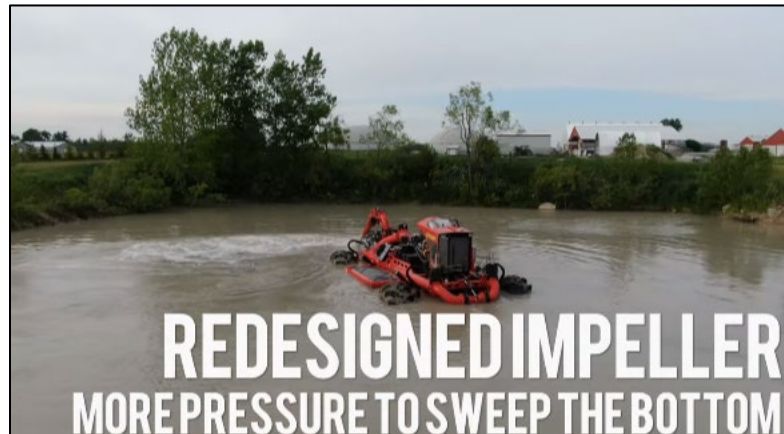


EX2047, 36.

=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.

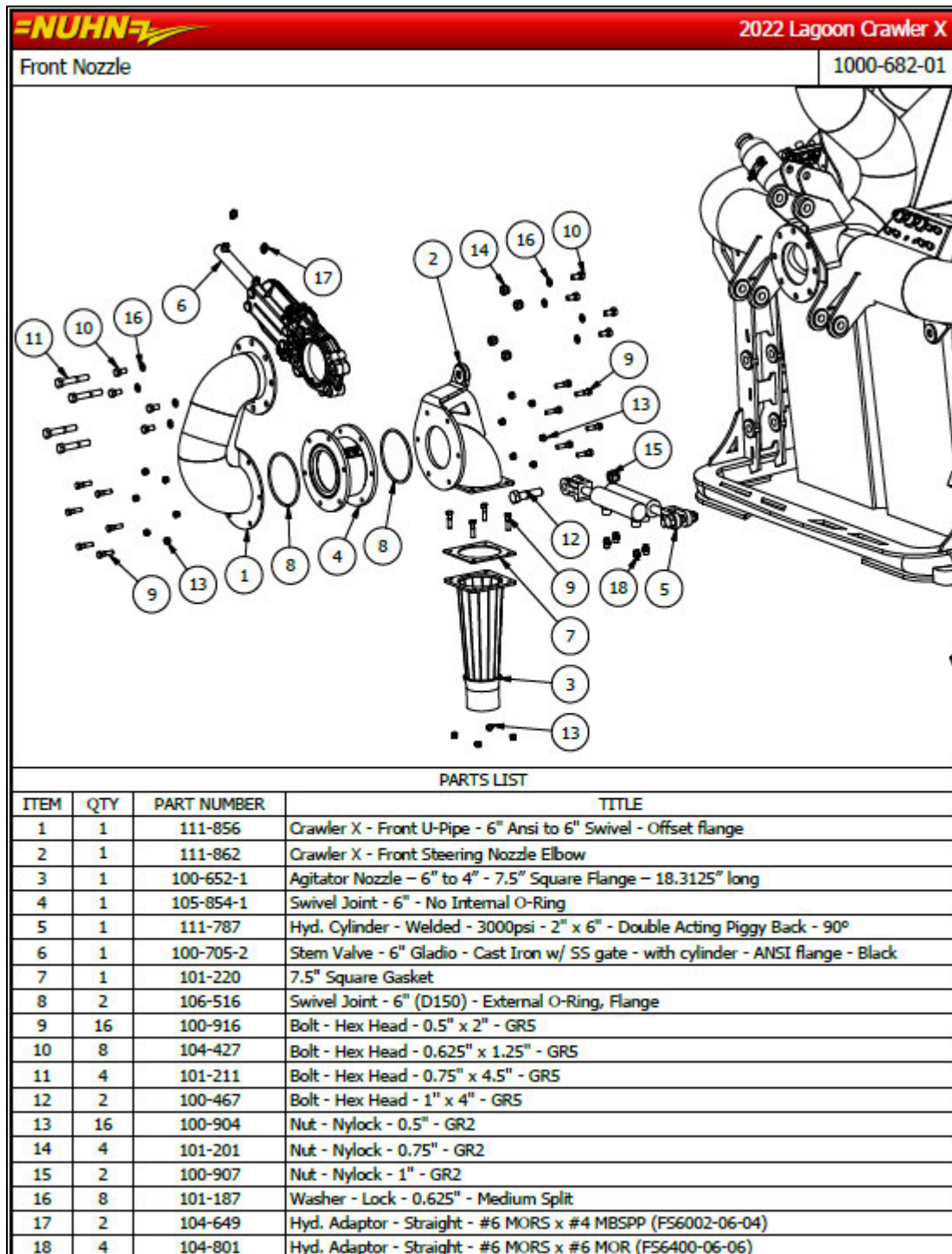
310. A video of the Lagoon Crawler X shows that a the pump is positioned on the bottom of the vehicle so that the impeller, which is a component of the fluid pump, can “sweep the bottom” of the lagoon.



EX1126, 3.

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)

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



EX2047, 19.

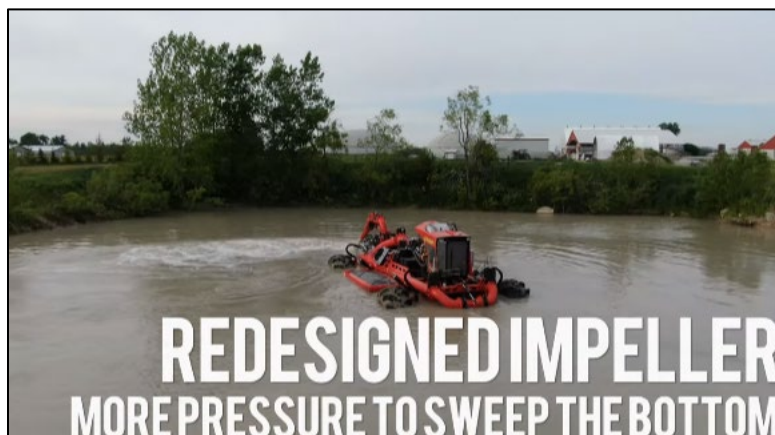
312. A brochure for the Lagoon Crawler X displays a fluid nozzle labeled as “steering.”



EX2046, 2.

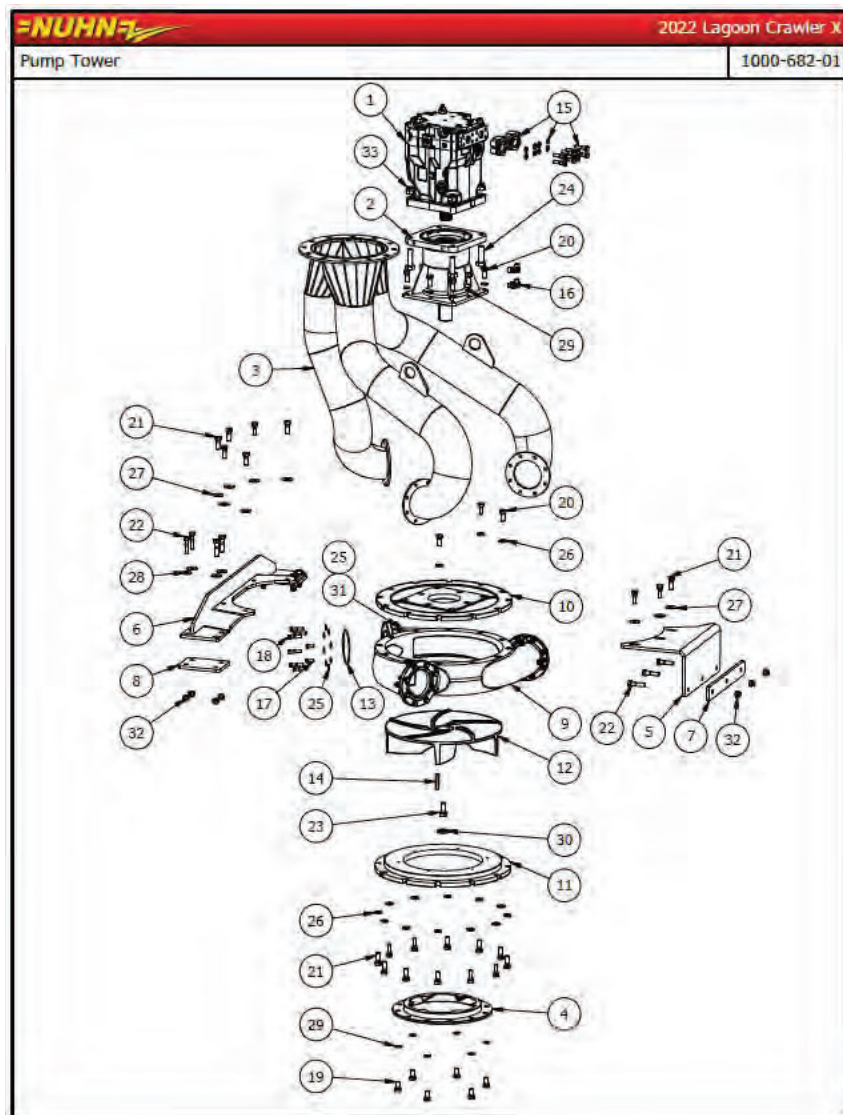
The immersible liquid manure pump of the liquid manure mover including a housing and an impeller that are positioned along the underside of the floatable vehicle body ('835 Patent, substitute claim 57 and 79)

313. 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.



EX1126, 3.

314. The parts catalog for the 2022 Lagoon Crawler X illustrates a pump tower having both a housing and impeller that is positioned alongside 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)

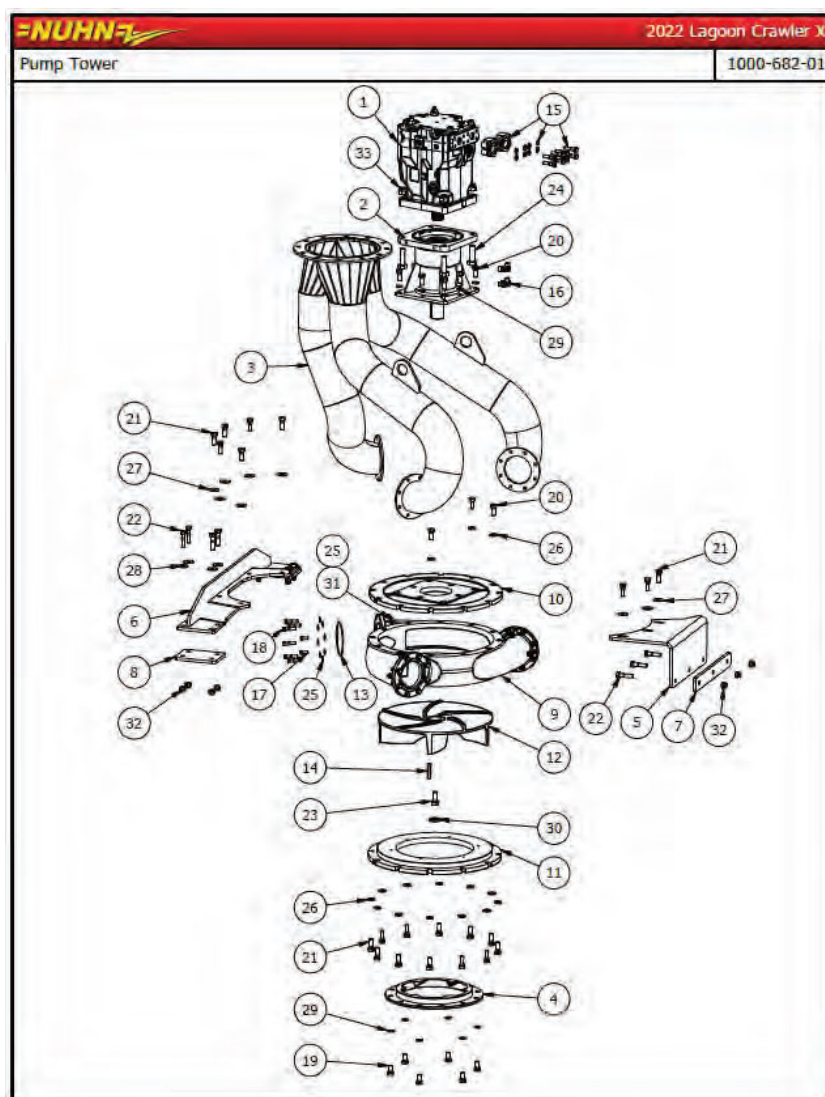
315. A brochure for the Lagoon Crawler X shows the pump submerged within liquid manure when the vehicle is floating in the lagoon.



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)

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



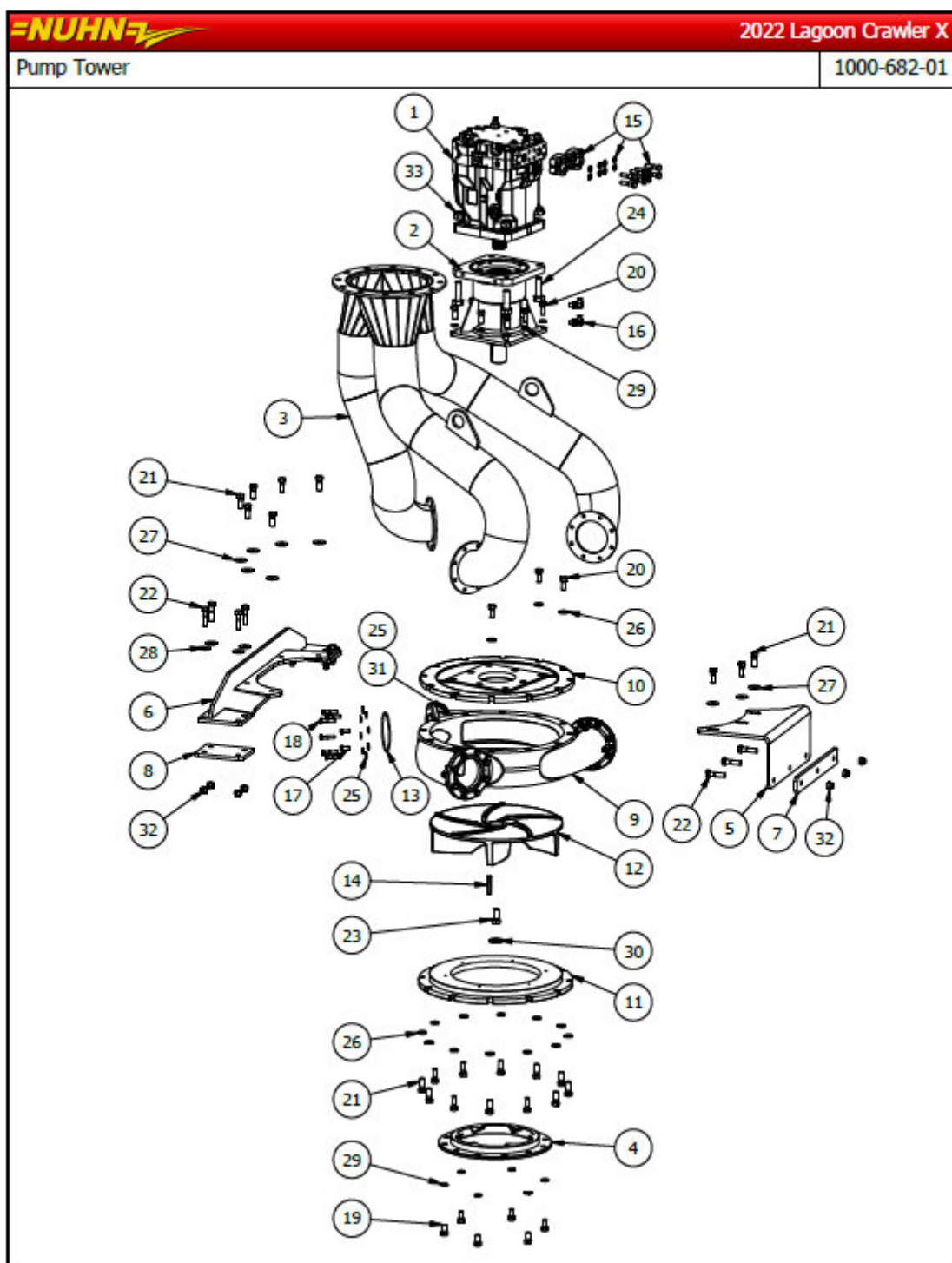
EX2047, 36.

Pump Tower			2022 Lagoon Crawler X
			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)

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

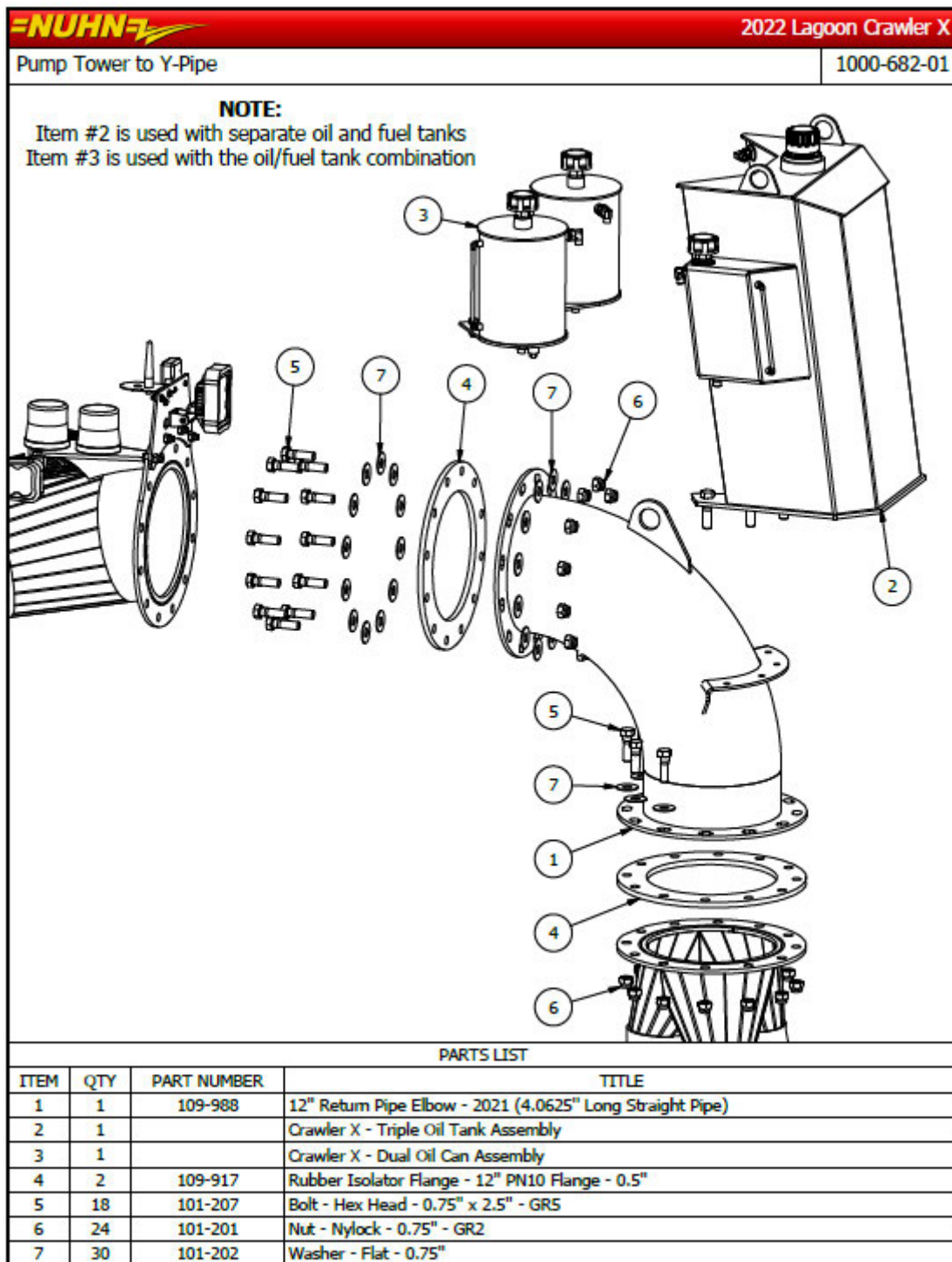


Id., 36.

=NUHN-7			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

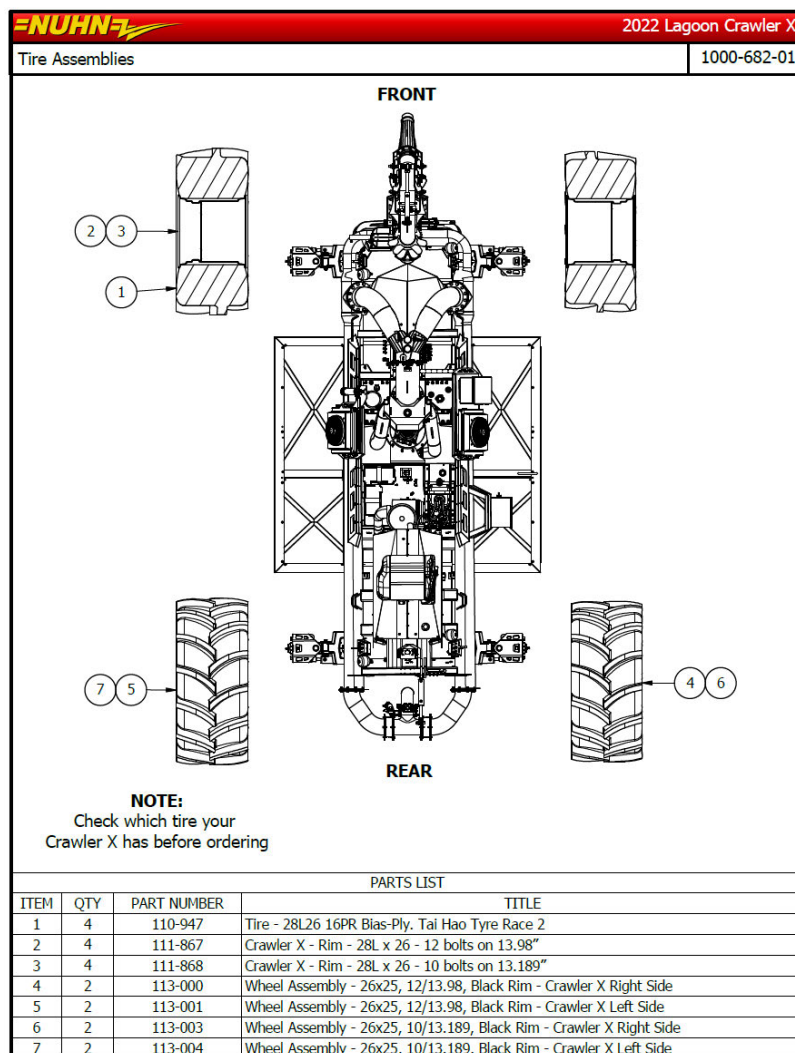
Id., 37.

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



Id., 31.

319. 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)

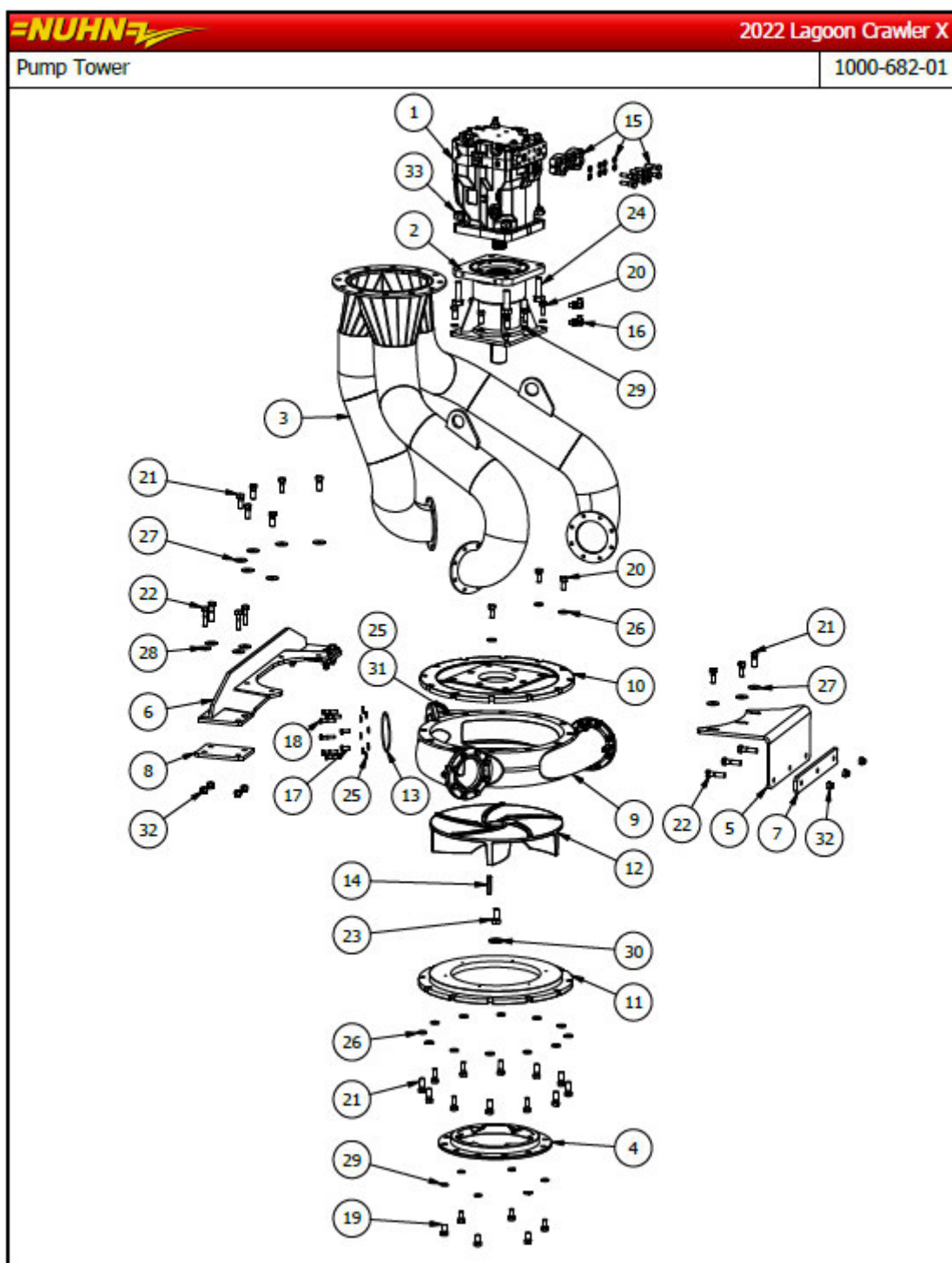
320. A video of the Lagoon Crawler X shows a flow of liquid manure propelled from a nozzle through the air and back into the lagoon.



EX1126, 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)

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

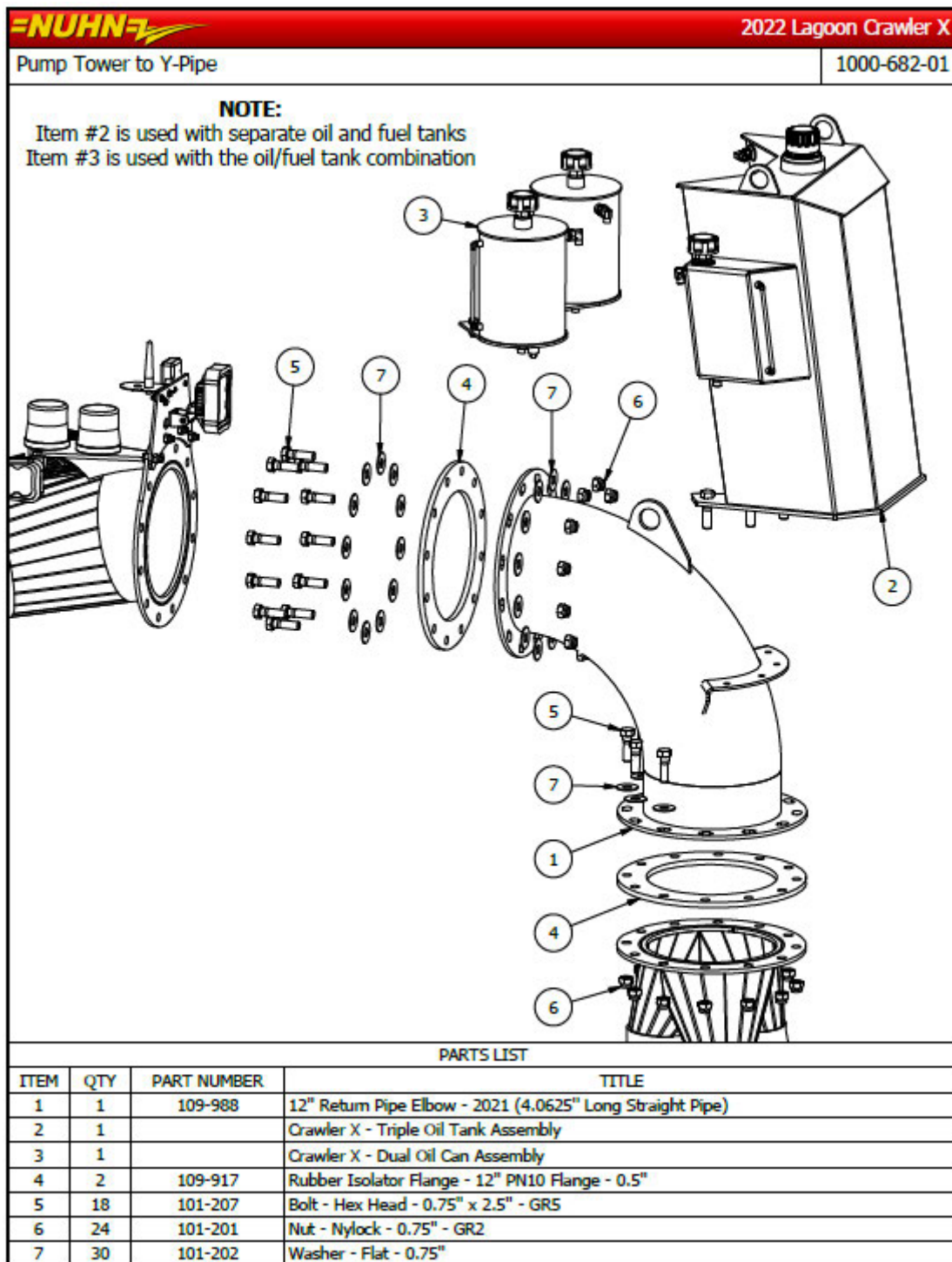


EX2047, 36.

=NUHN-7			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.

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



Id., 31.

323. 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.

324. 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 its products commercial success and new and 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 '425 Patent claims, it is my opinion that there is no nexus between Nuhn's secondary considerations evidence and the claims of the '425 Patent.

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

325. Nuhn and Mr. Prairie argue that Nuhn solved the problem of breaking a crust on a large lagoon, mixing solids, and forming a slurry. Paper 27 at 35. Nuhn's characterization of the alleged "long felt need" is belied by the '425 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 ’425 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.

326. 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 ’425 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.

327. Nuhn argues that it solved the problem of breaking a crust, mixing solids, and forming a slurry in large lagoons. Paper 27 at 35. But Puck’s product was already available before Nuhn filed its provisional application. [REDACTED] 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. 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 ’425 Patent, let alone the claims. Any ‘need’ met by the vehicle of the ’425 Patent was already solved prior to its effective filing date.

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

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

329. 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 pump to operate in[.]” Paper 27 at 39-41. 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 ’425 Patent, which say nothing about where the pump is located on the vehicle or in relation to the lagoon. Rather, the only difference from Truxor or SenwaTec that appears the claims of the ’425 Patent is the remote control of the

vehicle components. Allowing the operator to control the vehicle functions from outside the vehicle is not an unexpected result of the addition of remote control.

330. 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.” However, not all liquid manure lagoons even have crusts. *Supra* Section VI.A.i. As for those that do, a POSA (a mechanical engineer with knowledge of livestock manure) 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 IX.B.i.

331. 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 27 at 44. 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; EX1119. 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.

332. 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.

333. 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-Umweltdinste (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* EX1081; EX1120; EX1122.

334. 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. 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; EX1119. As Nuhn concedes, Puck was the market leader in large lagoon agitation at that time. A POSA would have understood and accepted these features prior to Nuhn’s alleged invention.

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

335. 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 propel its vehicle, not nozzles, as claimed in the '425 Patent and utilized by the Nuhn's Lagoon Crawler. EX2032, 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.

336. 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 direct the flow of manure out 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.

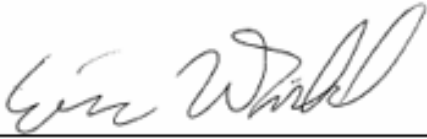
XIV. CONCLUSION

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

338. 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 Managing Consultant

August 6, 2024

Date

Appendix A

List of Materials Considered

Patents and Patent Applications

- U.S. Patent No. 10,124,638

Declarations

- Declaration of Benny D. Puck, Dated July 31, 2024
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