



BAZOOKA-FARMSTAR, LLC (PETITIONER)
v. NUHN INDUSTRIES LTD. (PATENT OWNER)

Case No. IPR2024-00098

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

PATENT OWNER'S IPR HEARING DEMONSTRATIVES

March 11, 2025



How are the '708 Patent Claims Different from the '425 Patent Claims?

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Claim 1 of the '425 Patent	Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
1. An amphibious vehicle comprising: a floatable vehicle body;	1. An amphibious vehicle comprising: a floatable vehicle body;	17. An amphibious vehicle comprising: a ground engaging propulsion structure comprising a first front wheel, a second front wheel, a first rear wheel, and a second rear wheel, wherein the first front wheel and the first rear wheel are on a first side of the vehicle and the second front wheel and the second rear wheel are on a second side of the vehicle;	21. An amphibious vehicle comprising: a floatable vehicle body comprising a first buoyant element on a first side of the vehicle body and a second buoyant elements on a second side of the vehicle body;	23. An amphibious vehicle comprising: A floatable vehicle body comprising buoyant elements having foam filled buoyant chambers, the buoyant elements comprising a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front when and a second rear wheel;
ground engaging propulsion structure comprising a plurality of ground engaging elements powered by a hydraulic motor;	a ground engaging propulsion structure;	four variable speed hydraulic motors, one variable speed hydraulic motor per wheel, for independently driving the wheels at variable speeds;	a ground engaging propulsion structure comprising a first front wheel, a second front wheel, a first rear wheel, and a second rear wheel, wherein the first front wheel and the first rear wheel are on the first side of the vehicle body and the second front wheel and the second rear wheel are on the second side of the vehicle body, and wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;	A ground engaging propulsion structure;

How are the '708 Patent Claims Different from the '425 Patent Claims? (continued)

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Claim 1 of the '425 Patent	Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
a fluid pump for pumping liquid manure;	a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in a liquid manure lagoon;	a floatable vehicle body comprising a first buoyant element situated between the first front wheel and the first rear wheel and a second buoyant element between the second front wheel and the second rear wheel;	a liquid manure pump comprising a pump housing and an impeller in the pump housing, wherein the impeller is immersed in a liquid manure lagoon when the vehicle is floating in the liquid manure lagoon;	A power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in a liquid manure lagoon, and
a power source connected to a hydraulic pump, the power source configured to provide power to both the ground engaging propulsion structure and the fluid pump; and,	a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon; and	a rotating shaft configured to move liquid manure in a liquid manure lagoon;	a fluid outlet in fluid communication with the liquid manure pump, wherein the liquid manure pump is configured to pump liquid manure through the fluid outlet;	A wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.
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.	an impeller in a liquid manure pump, the liquid manure pump comprising a bottom fluid inlet configured to be immersed in the liquid manure when the vehicle is floating, whereby the impeller is configured to draw liquid manure to be pumped through the bottom fluid inlet, the liquid manure pump comprising a housing with the bottom fluid inlet in the housing.	a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in the liquid manure lagoon; and	a hydraulic articulation cylinder configured to change an orientation of the fluid outlet relative to the vehicle body;	

How are the '708 Patent Claims Different from the '425 Patent Claims? (continued)

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Claim 1 of the '425 Patent	Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
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.	an impeller in a liquid manure pump, the liquid manure pump comprising a bottom fluid inlet configured to be immersed in the liquid manure when the vehicle is floating, whereby the impeller is configured to draw liquid manure to be pumped through the bottom fluid inlet, the liquid manure pump comprising a housing with the bottom fluid inlet in the housing.	a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in the liquid manure lagoon; and	a hydraulic articulation cylinder configured to change an orientation of the fluid outlet relative to the vehicle body;	
		a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.	a power source configured to provide power to both the ground engaging propulsion structure and the liquid manure pump; and	
			a wireless remote control configured to enable an operator remote from the vehicle to: (1) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (2) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon; and, (3) control a flow of liquid manure from the liquid manure pump.	

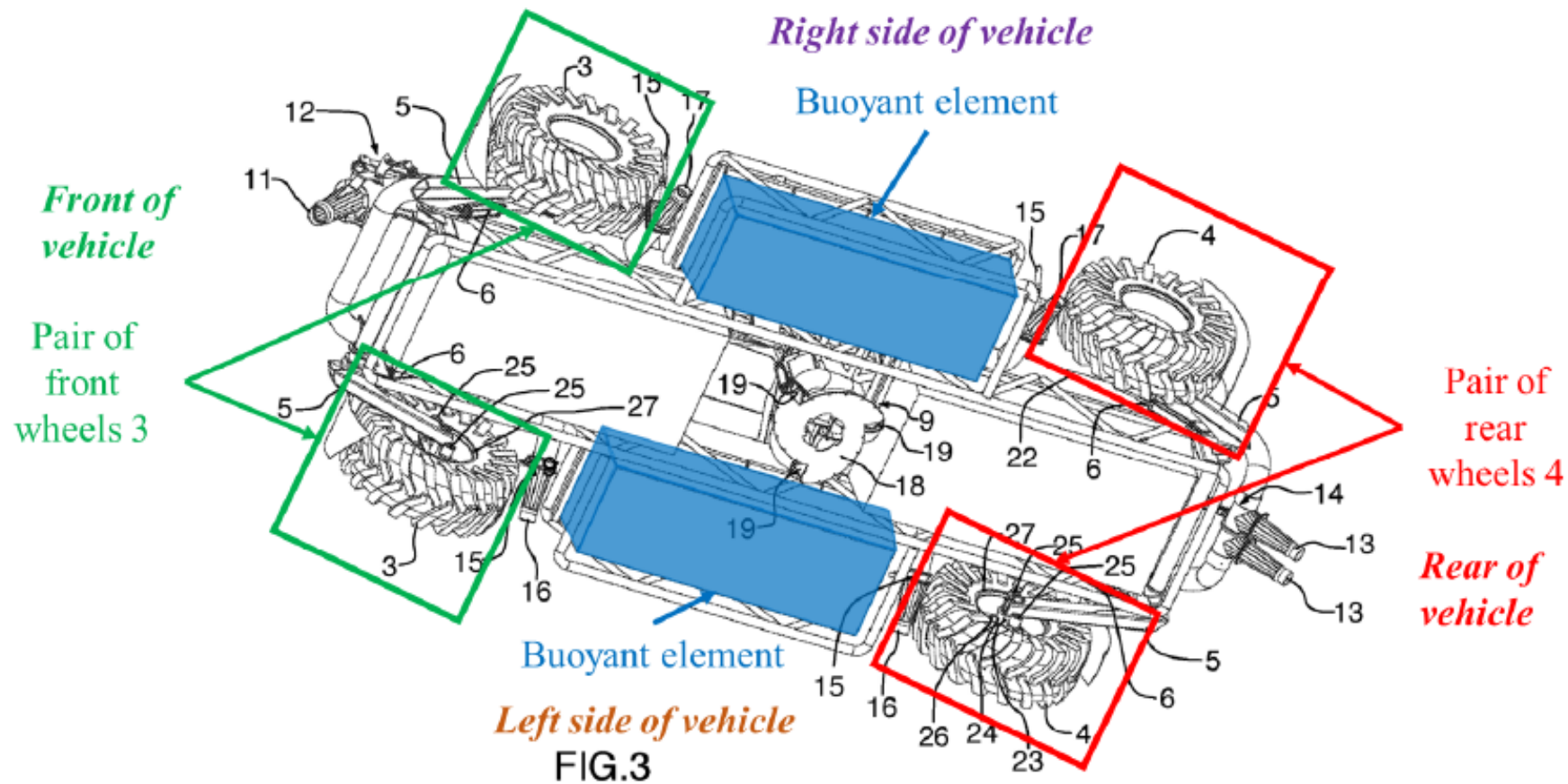
Key Limitation: (1) Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle Body (Claims 17, 21, and 23)

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Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
1. An amphibious vehicle comprising: a floatable vehicle body;	17. An amphibious vehicle comprising: a floatable vehicle body comprising a first buoyant element situated between the first front wheel and the first rear wheel and a second buoyant element between the second front wheel and the second rear wheel;	21. An amphibious vehicle comprising: a floatable vehicle body comprising a first buoyant element on a first side of the vehicle body and a second buoyant elements on a second side of the vehicle body; wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;	23. An amphibious vehicle comprising: a floatable vehicle body comprising buoyant elements having foam filled buoyant chambers, the buoyant elements comprising a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front wheel and a second rear wheel;

Key Limitation: (1) Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle Body (Claims 17, 21, and 23)

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EX2099, ¶105.



Key Limitation: (2) Liquid Manure Pump and Associated Structure (e.g., impeller, housing, immersible bottom fluid inlet in the housing)

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Claims 1 and 21, and Claim 17 (partial)

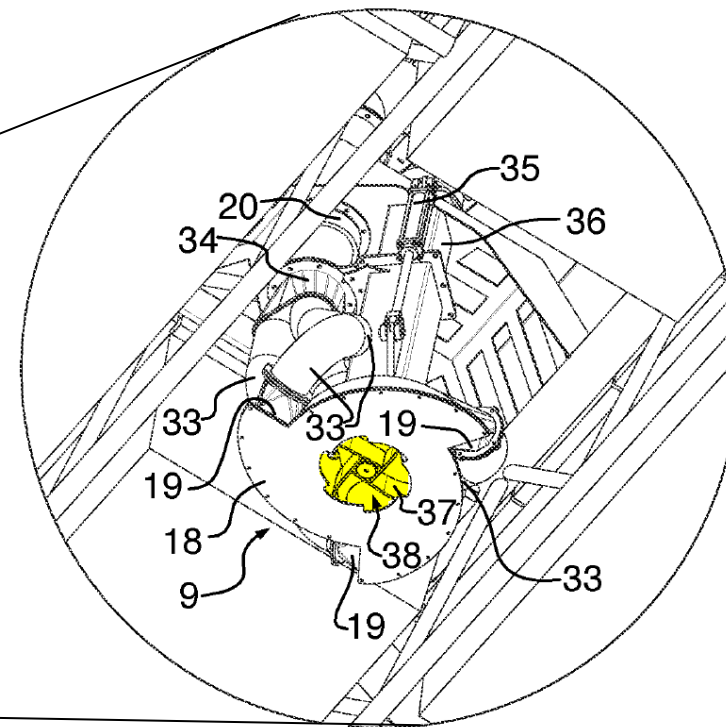
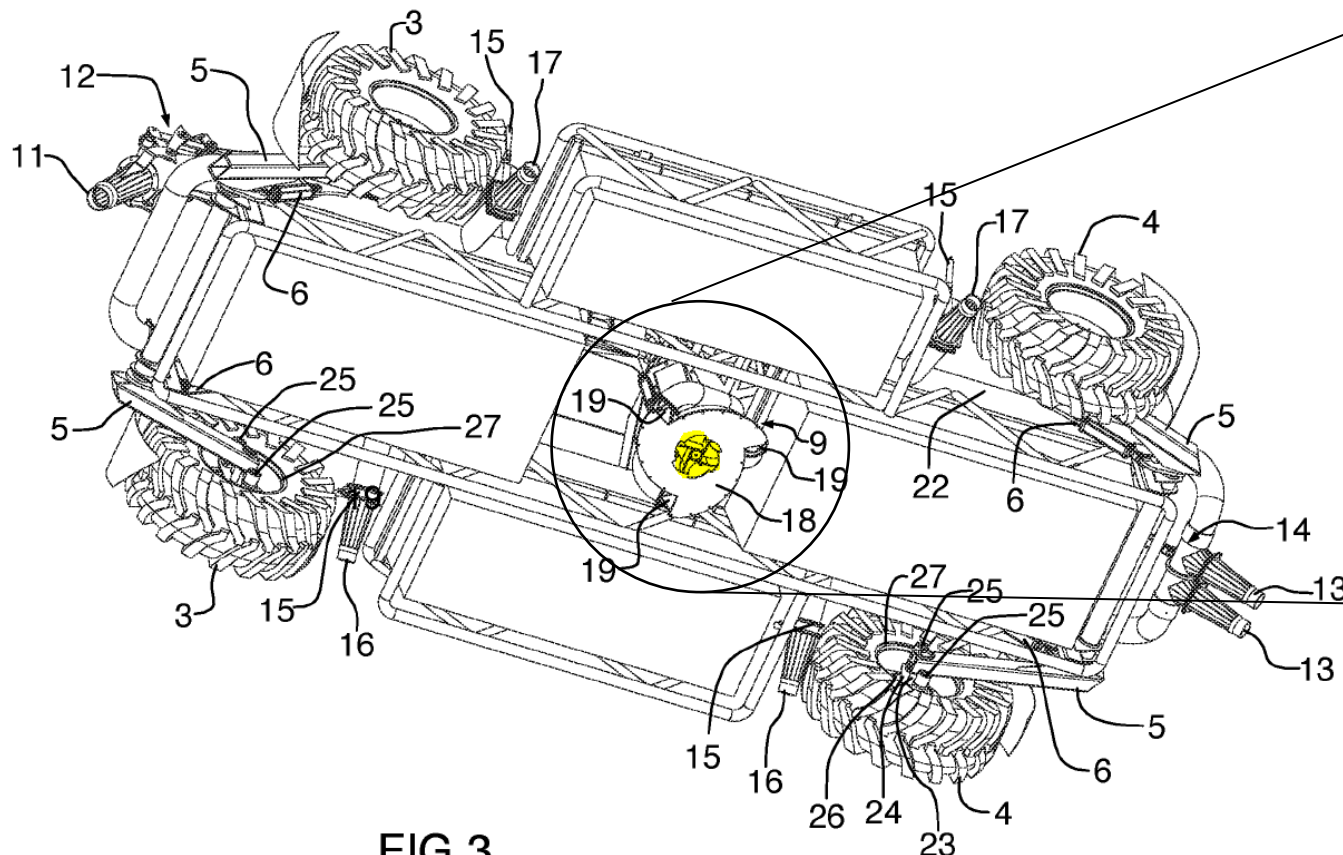
Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent
1. An amphibious vehicle comprising: an impeller in a liquid manure pump, the liquid manure pump comprising a bottom fluid inlet configured to be immersed in the liquid manure when the vehicle is floating, whereby the impeller is configured to draw liquid manure to be pumped through the bottom fluid inlet, the liquid manure pump comprising a housing with the bottom fluid inlet in the housing.	17. An amphibious vehicle comprising: a rotating shaft configured to move liquid manure in a liquid manure lagoon;	21. An amphibious vehicle comprising: a liquid manure pump comprising a pump housing and an impeller in the pump housing, wherein the impeller is immersed in a liquid manure lagoon when the vehicle is floating in the liquid manure lagoon;

Key Limitation: (2) Liquid Manure Pump and Associated Structure (e.g., impeller, housing, immersible bottom fluid inlet in the housing)

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Claims 1 and 21, and Claim 17 (partial)

EX1001, p. 9, Fig. 8.



EX1001, p. 5, Fig. 3.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE



Key Limitation: (3) Wireless Remote Control of power source, speed/direction on ground, and speed/direction while floating (Claims 1, 17, 21, 23)

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Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
1. An amphibious vehicle comprising: a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon; and	17. An amphibious vehicle comprising: a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.	21. An amphibious vehicle comprising: a wireless remote control configured to enable an operator remote from the vehicle to: (1) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (2) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon; and, (3) control a flow of liquid manure from the liquid manure pump.	23. An amphibious vehicle comprising: A wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.



Key Limitation: (4) Power Source Providing Power to Move the Vehicle Both When Ground Engaging and Floating (Claims 1, 17, 21, and 23)

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Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
1. An amphibious vehicle comprising: a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in a liquid manure lagoon;	17. An amphibious vehicle comprising: a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in the liquid manure lagoon; and	21. An amphibious vehicle comprising: a power source configured to provide power to both the ground engaging propulsion structure and the liquid manure pump; and	23. An amphibious vehicle comprising: a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in a liquid manure lagoon, and



Key Limitation: (5) Four Variable Speed Hydraulic Motors, One Per Wheel (Claim 17)

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Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
1. An amphibious vehicle comprising: a ground engaging propulsion structure;	17. An amphibious vehicle comprising: four variable speed hydraulic motors, one variable speed hydraulic motor per wheel, for independently driving the wheels at variable speeds;	21. An amphibious vehicle comprising: a ground engaging propulsion structure comprising a first front wheel, a second front wheel, a first rear wheel, and a second rear wheel, wherein the first front wheel and the first rear wheel are on the first side of the vehicle body and the second front wheel and the second rear wheel are on the second side of the vehicle body, and wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;	23. An amphibious vehicle comprising: a ground engaging propulsion structure;

Claim Construction

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1. “liquid manure” (independent claims 1, 17, 21, and 23)
2. “liquid manure pump” (independent claims 1 and 21)
3. “between” (independent claims 17, 21, and 23)

Claim Construction

13

1. “liquid manure” (independent claims 1, 17, 21, and 23)

Petitioner’s Expert:

68. A POSA would have understood that “liquid manure” refers to a type of manure with the lowest solids content contained therein. A POSA would have understood that the solids concentration in the liquid volume of a typical liquid manure lagoon is on the order of a few percent or less, and liquid manure is readily pumped using water pumps. *See infra* Section V.B.iii.a.

EX1004, ¶68.

Patent Owner’s Expert:

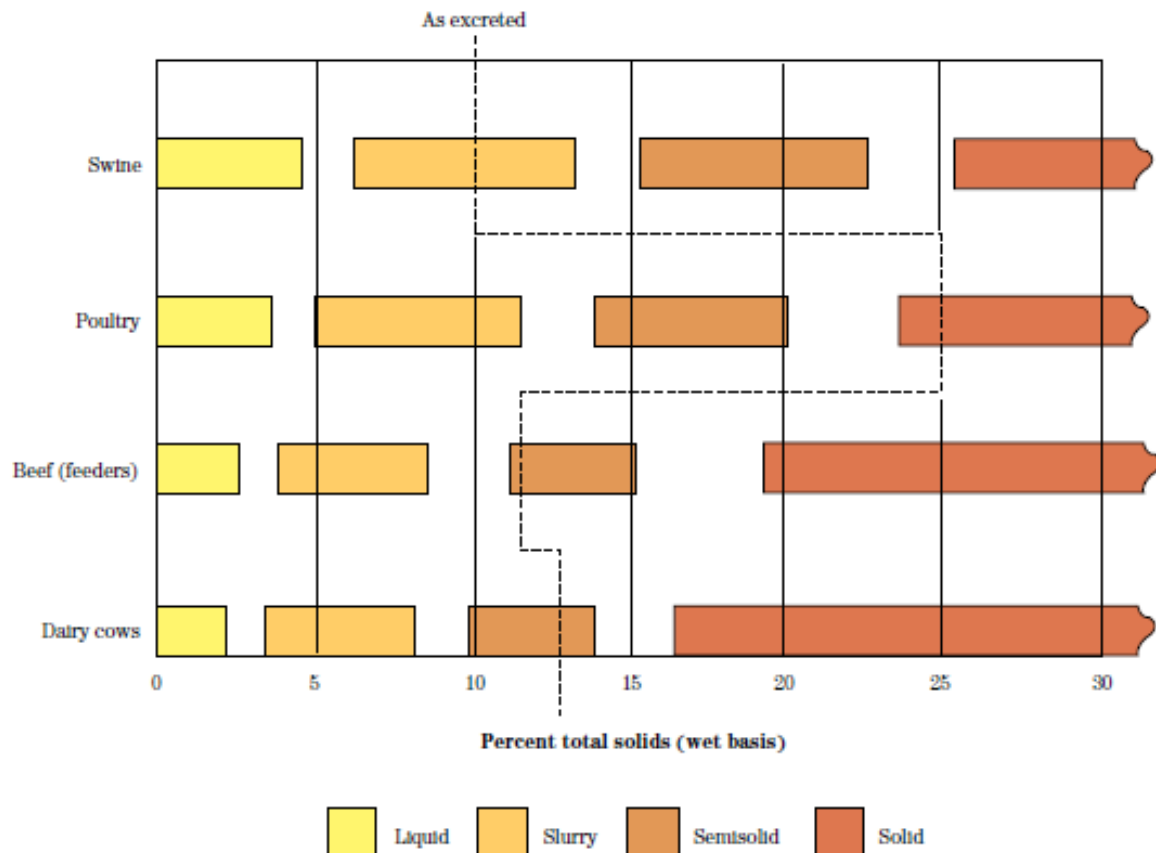
95. Accordingly, in my opinion, a POSITA would not apply the Petitioner’s narrow definition of “liquid manure” to the ‘708 Patent, but instead would interpret the references to “liquid manure” in the ‘708 Patent claims as the “animal manure contained in a farm lagoon, which includes suspended solids.” It is my opinion that the suspended solids of liquid manure includes

EX2099, ¶95.

Claim Construction

1. “liquid manure” (independent claims 1, 17, 21, and 23)

Figure 12-92 Relative handling characteristics of different kinds of manure and percent total solids



Petitioner’s Expert:

68. A POSA would have understood that “liquid manure” refers to a type of manure with the lowest solids content contained therein. A POSA would have understood that the solids concentration in the liquid volume of a typical liquid manure lagoon is on the order of a few percent or less, and liquid manure is readily pumped using water pumps. See *infra* Section V.B.iii.a.

EX1004, ¶68.

EX1063, p. 89.

Claim Construction

15

1. “liquid manure” (independent claims 1, 17, 21, and 23)

Patent Owner’s Expert:

95. Accordingly, in my opinion, a POSITA would not apply the Petitioner’s narrow definition of “liquid manure” to the ‘708 Patent, but instead would interpret the references to “liquid manure” in the ‘708 Patent claims as the “animal manure contained in a farm lagoon, which includes suspended solids.” It is my opinion that the suspended solids of liquid manure includes

‘708 Patent:

Manure produced during animal husbandry, particularly hog and cattle manure, is transferred by washing to a pit or lagoon for storage prior to removal for land application or further processing. During storage, a crust can develop on the surface of the pit or lagoon that must be disrupted prior to or during removal of the manure. Pumps are employed for

EX1001, 1:35-40.

‘708 Patent:

TECHNICAL FIELD

25

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

30

EX1001, 1:25-31.

telescoping connections to the single fluid conduit. Lowering the fluid pump for immersion into the fluid obviates the need for priming the fluid pump, which can be problematic when the fluid is manure comprising solid materials that can plug the pump or priming structure. Immersion of the pump

20

EX1001, 3:16-20.

What makes liquid manure different than water?

16

Highly Corrosive:



Paper 2,10.

What makes liquid manure different than water?

17

Highly Corrosive - Experts Agree

Petitioner's Expert

101. Animal waste is also known to exhibit **corrosive** characteristics and metal exposed to liquid animal wastes, such as those in manure lagoons, can result in significant material loss. One study reports that as much as several millimeters of material could be lost from a metallic plate in a year's time. EX1052, 5. Other studies describe some metal samples losing the entirety of their metal mass in less than 30 months of exposure to the lagoon surface. EX1053, 8. A POSA would have been motivated to avoid exposing certain types of metal equipment, such as vehicle trailers, to corrosive lagoon liquids.

EX1004, ¶101.

Patent Owner's Expert

130. Moreover as asserted by Petitioner and Dr. Winkel, a POSITA would have understood that liquid manure lagoon is highly corrosive. See EX1004, Winkel Decl. ¶ 101. Dr. Winkel asserts that "[a] POSA would have been motivated to avoid exposing certain types of metal equipment, such as vehicle trailers, to corrosive lagoon liquids." *Id.* He's **entirely correct on this point**, and for that very reason a POSITA would have never looked to using an amphibious vehicle in a liquid manure lagoon. Thus a POSITA would not have utilized an amphibious vehicle with

EX2099, ¶130.



FUNDAMENTAL QUESTIONS:

What makes liquid manure different than water?

A Non-Newtonian Fluid - Experts Agree (at least above 5 %TS)

Petitioner's Expert

93. A POSA would have understood that some higher concentrations of manure exhibit non-Newtonian behaviors, specifically shear-thinning characteristics. See, e.g., EX2097, 8. A POSA would have understood that non-Newtonian behavior begins to manifest at higher solids concentrations, higher than the few percent or less solids that are typically found in liquid manures contained in manure lagoons. For example, in a study involving manure from lactating cows and samples taken from a manure storage tank containing bedding, urine, fresh and old manure, and water, Kumar reports that “[w]hen the slurry was below five percent total solids, it showed Newtonian flow properties, and above six percent it showed non-Newtonian (pseudo-plastic) flow properties.” EX1129, 3. Kumar concludes that

Patent Owner's Expert

particular characteristics of the liquids.” EX1041 at 12 (emphasis added). Dr. Winkel entirely ignores that cattle manure—even at 1 to 2% total solids content—has been found to act as a non-Newtonian fluid. See, e.g., EX2097 at 2, H. Landry et al., *Physical and Rheological Properties of Manure Products*, APPLIED ENGINEERING IN AGRICULTURE, at 278 (2004) (discussing study by Chen (1982) that “included rheological properties for TS ranging from 1% to 14%. Beef cattle slurries were described as non-Newtonian pseudoplastic fluids, the deviation from Newtonian behavior increasing with TS”); *id.* at 2 (“Achkari-Begdouri and Goodrich (1992) studied the rheological properties of Moroccan dairy cattle manure with total solids concentrations ranging from 2.5% to 12% at temperatures between 20°C and 60°C. Their results showed that in the ranges

EX2099, ¶93.

EX1079, ¶93.

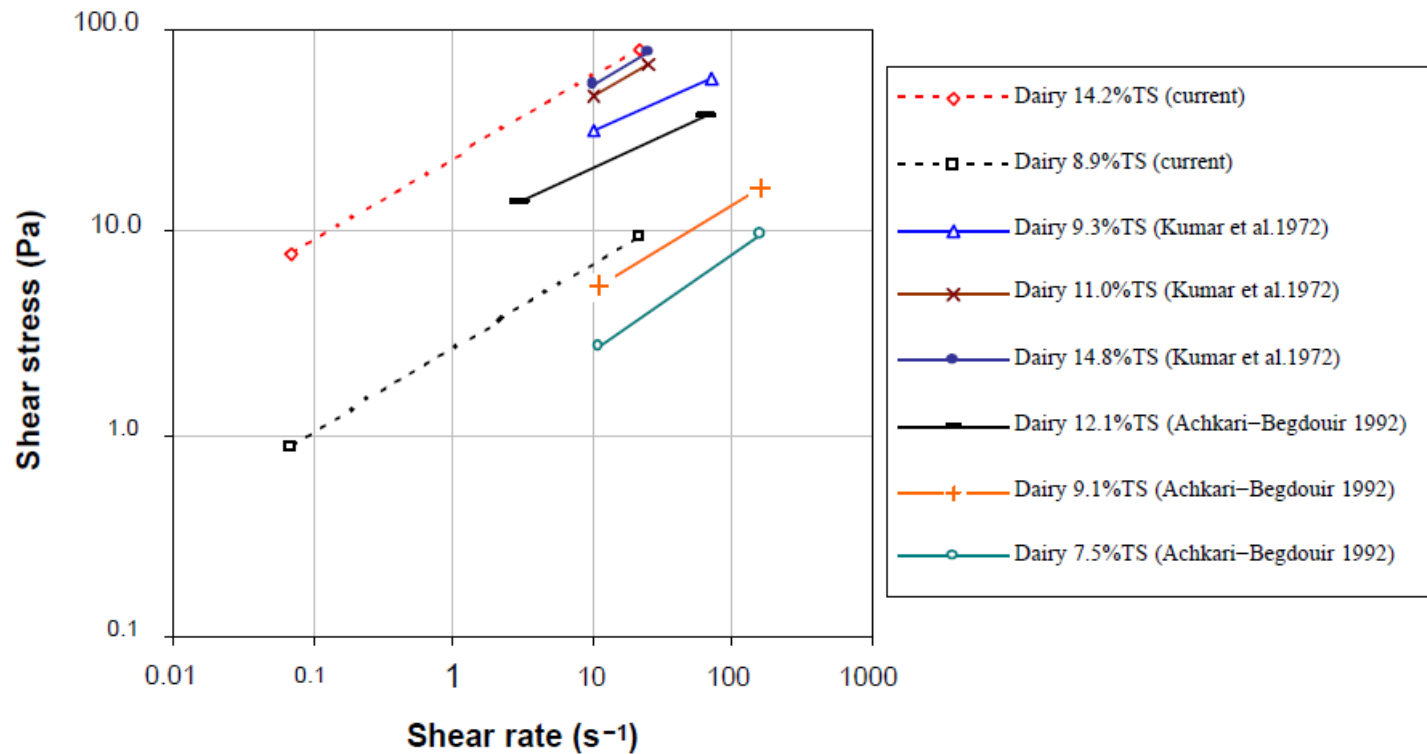
DEMONSTRATIVE EXHIBIT - NOT EVIDENCE



What makes liquid manure different than water?

19

A Non-Newtonian Fluid With Suspended Solids



EX2097, 9.

Figure 6. Shear stress – shear rate curves for dairy cattle manure (current study and other published results).

Claim Construction

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2. “liquid manure pump” (independent claims 1 and 21)

Petitioner’s Expert:

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

EX1079, ¶57.

68. A POSA would have understood that “liquid manure” refers to a type of manure with the lowest solids content contained therein. A POSA would have understood that the solids concentration in the liquid volume of a typical liquid manure lagoon is on the order of a few percent or less, and liquid manure is readily pumped using water pumps. See *infra* Section V.B.iii.a.

EX1004, ¶68.

Patent Owner’s Expert:

98. After reviewing the prosecution history, it is my opinion that a POSITA would interpret the claimed “liquid manure pump” as “a pump that pumps manure” as opposed to a generic pump, a general-purpose dredging pump, or a pump that is merely capable of pumping liquid manure in the theoretical sense if someone attempted to put a pump to that use. In particular, a POSITA would see and rely on the fact that during *ex parte* reexamination of the ’425 Patent, the USPTO explained that the ’425 Patent claims were allowable because the prior art did not disclose “a pump that pumps manure”:

EX2099, ¶98.



Claim Construction

21

2. “liquid manure pump” (independent claims 1 and 21)

AWM Field Handbook:

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

EX1063, p. 42.

LMASD Manual:

equipment as water, with some precautions. Slurries with solids over 4% generally require special equipment to be pumped (see “Storage Agitation and Emptying,” page 47). With proper separation, dilution,

EX1037, p. 61.

Claim Construction

22

2. “liquid manure pump” (independent claims 1 and 21)

Manure Injection Equipment



HOSE

Snap-tite Drag
4 1/2", 5", 5 1/2", & 6"
6" G&H Feeder
200 & 250 PSI
New 8" Supply Hose!



1-800-775-7448
319- 653-5080
www.bazookafarmstar.com

Manufacturing • Manure Injection Systems • Livestock Feeders • Grain Handling

Cornell Manure Pumps



4x4x14T-14
4NHTB-17.5
6NHTB-17.5
6NHTB-19

Manure-Manager I (EX1019):

Cornell Manure Pumps



4x4x14T-14
4NHTB-17.5
6NHTB-17.5
6NHTB-19

EX1019, 23.



Claim Construction

23

2. “liquid manure pump” (independent claims 1 and 21)
Manure-Manager II (EX1020):

The advertisement features a farmer and his wife in a field. The farmer has a speech bubble that says, "We should have used CORNELL PUMPS ...". To his right are three pump models: a large black self-priming pump, a yellow hydraulic submersible pump, and a green 6NHTB19 pump. A yellow starburst graphic above the pumps says "NOW OFFERING". To the right of the pumps is the Cornell Pump Company logo and a list of features. The features are circled in red.

CORNELL

GOT MANURE? GET CORNELL!

- Over 30 models of Solids-Handling pumps available
- Low head transfer to High Head Boosters
- High Efficiency – fuel savings
- Heavy Duty Construction – lower maintenance
- 50+ years in Manure Handling
- Innovative Designs for handling Liquid Waste Slurry
- Providing pumps with long service life

SELF-PRIMING **HYDRAULIC SUBMERSIBLE** **6NHTB19**

CORNELL PUMP COMPANY www.cornellpump.com
bjansen@cornellpump.com Phone: (503) 653-0330 Fax: (503) 653-0338

EX1020, 23.

Claim Construction

2. “liquid manure pump” (independent claims 1 and 21)

Puck (EX1014):

[0025] Coupled to the power source (36) is a liquid manure pump such as a slurry pump (38). In the preferred embodiment, the slurry pump (38) is a Cornell Redi-Prime centrifugal pump capable of handling both solid and liquid material. The slurry pump (38) is preferably designed to move between one thousand and twenty-four thousand liters of material per minute, more preferably between eight thousand and twenty thousand liters of material per minute, and most preferably about sixteen thousand liters of material per minute.

EX1014, ¶0025.

Claim Construction

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2. “liquid manure pump” (independent claims 1 and 39)

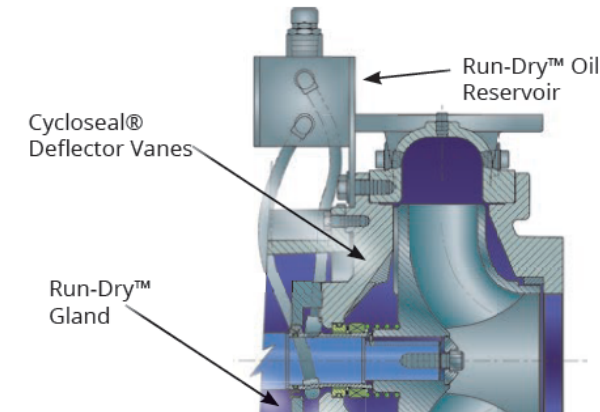
Cornell Redi-Prime (EX1134):

MARKET AND PRODUCT LINE



CYCLOSEAL®

Cornell's Cycloseal® design has proven itself in the toughest applications from manure slurry to starch recovery to sewer bypass and mining applications - in some cases more than tripling the normally expected mechanical seal life.



EX1134, 7.

EX1134, 8.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Claim Construction

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3. “between” (independent claims 17, 21, and 23)

Petitioner’s Expert:

second rear wheel.” I understand that the PTAB preliminarily construed “between” as meaning “in the space that separates.” Paper 10 at 13-15. It is my opinion that the proper construction of the term “between” is more broadly “in intermediate relation to.” My opinion is supported by the intrinsic evidence, including the ’708 Patent

EX1004, ¶68.

Patent Owner’s Expert:

107. Therefore, it is my opinion that a POSITA would understand the claim language reciting a “first buoyant element [situated/is] between the first front wheel and the first rear wheel” and a “second buoyant element [situated/is] between the second front wheel and the second rear wheel” to mean “a buoyant element is positioned in the space between the front wheel and the rear wheel on the each of the right and left sides of the vehicle body.” It is my understanding that the Board has preliminarily construed “between” to mean “in the space that separates.” Paper 10 at 15. The Board’s preliminary construction is in line with my understanding with how a POSITA would understand this claim language.

EX2099, ¶107.

Board:

In view of the above and the evidence of record, we preliminarily construe “between” as meaning “in the space that separates.”

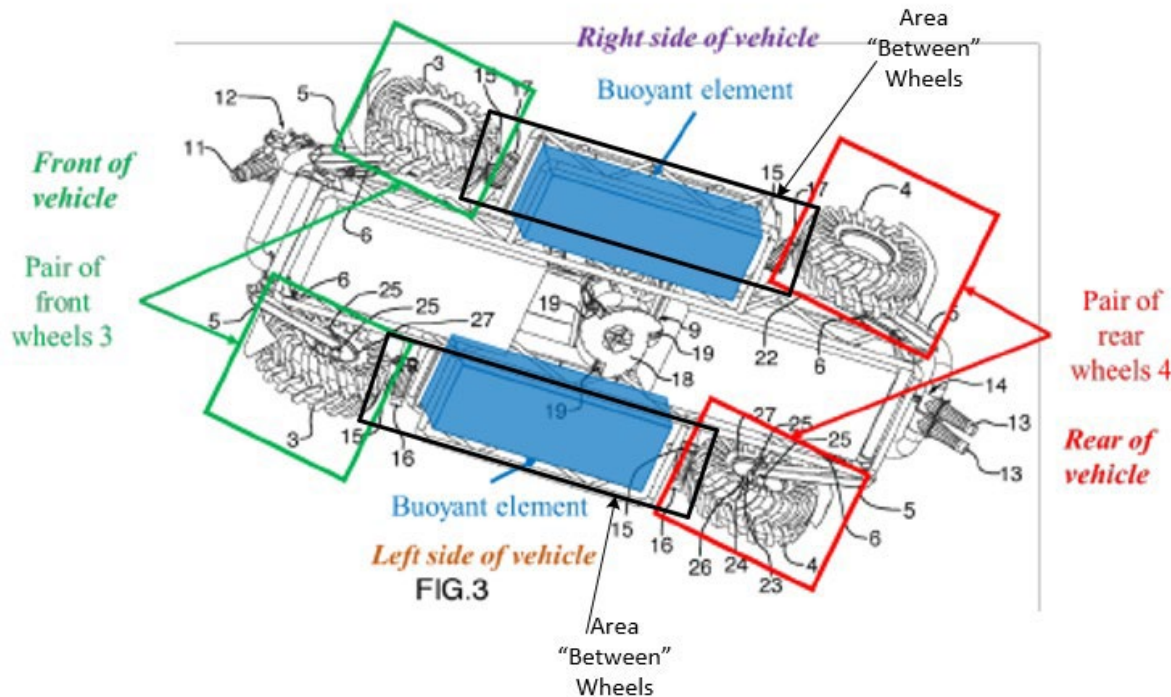
No other terms require express construction at this stage. *See Realtime*

Paper 10,
p. 15.



Claim Construction

3. “between” (independent claims 17, 21, and 23)



Patent Owner's Expert:

107. Therefore, it is my opinion that a POSITA would understand the claim language reciting a “first buoyant element [situated/is] between the first front wheel and the first rear wheel” and a “second buoyant element [situated/is] between the second front wheel and the second rear wheel” to mean **“a buoyant element is positioned in the space between the front wheel and the rear wheel on the each of the right and left sides of the vehicle body.”** It is my understanding that the Board has preliminarily construed **“between”** to mean **“in the space that separates.”** Paper 10 at 15. **The Board's preliminary construction is in line with my understanding with how a POSITA would understand this claim language.**

EX2099, ¶107.

EX1001, p. 5, Fig. 3.



Claim Construction

28

3. “between” (independent claims 17, 21, and 23)

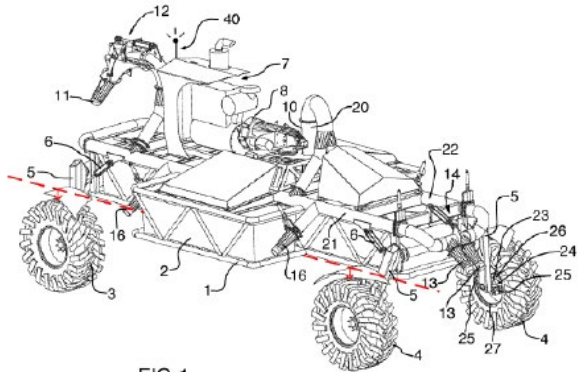


FIG. 1
Fig. 1 of '708 Patent

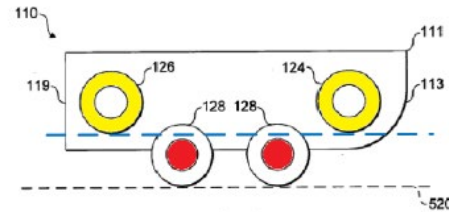


FIG. 6
Fig. 6 of Bailey

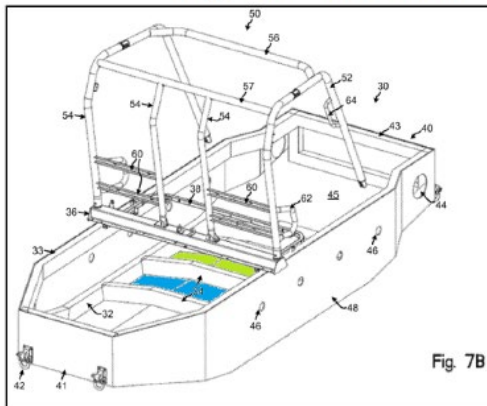


Fig. 7B of Bennett-II



Photograph of SenwaTec

Petitioner's Expert:

second rear wheel.” I understand that the PTAB preliminarily construed “between” as meaning “in the space that separates.” Paper 10 at 13-15. It is my opinion that the proper construction of the term “between” is more broadly “in intermediate relation to.” My opinion is supported by the intrinsic evidence, including the '708 Patent

EX1004, ¶68.

Paper 1, pp. 1, 35;
Paper 29, pp. 5, 8, 19.

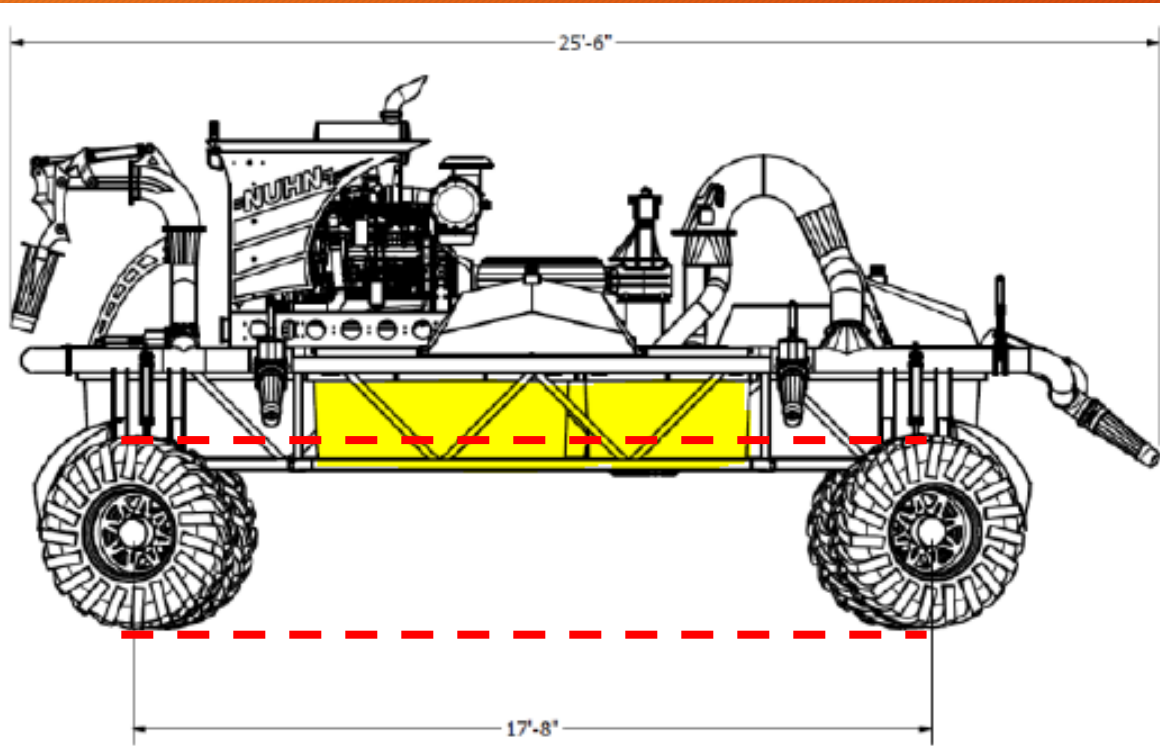
DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Claim Construction

29

3. “between” (independent claims 17, 21, and 23)

Petitioner’s Expert:



EX2036, p. 5.

side of the vehicle, Figure 1 of the '708 Patent shows the wheels 3, 4 of the vehicle lowered to a position below the vehicle body 1. Thus, in Figure 1 of the '708 Patent, the buoyant element 2 is located above the space that separates wheels 3, 4—not within the space that separates the wheel 3, 4. Despite this, I understand that Nuhn's

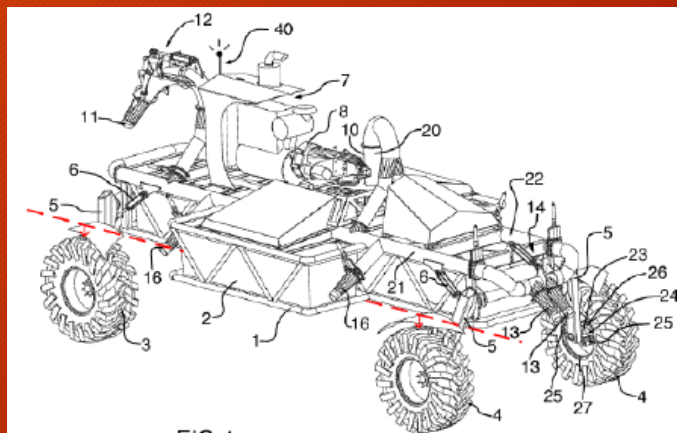


FIG.1

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

EX1079, ¶32.

EX1079, ¶33.

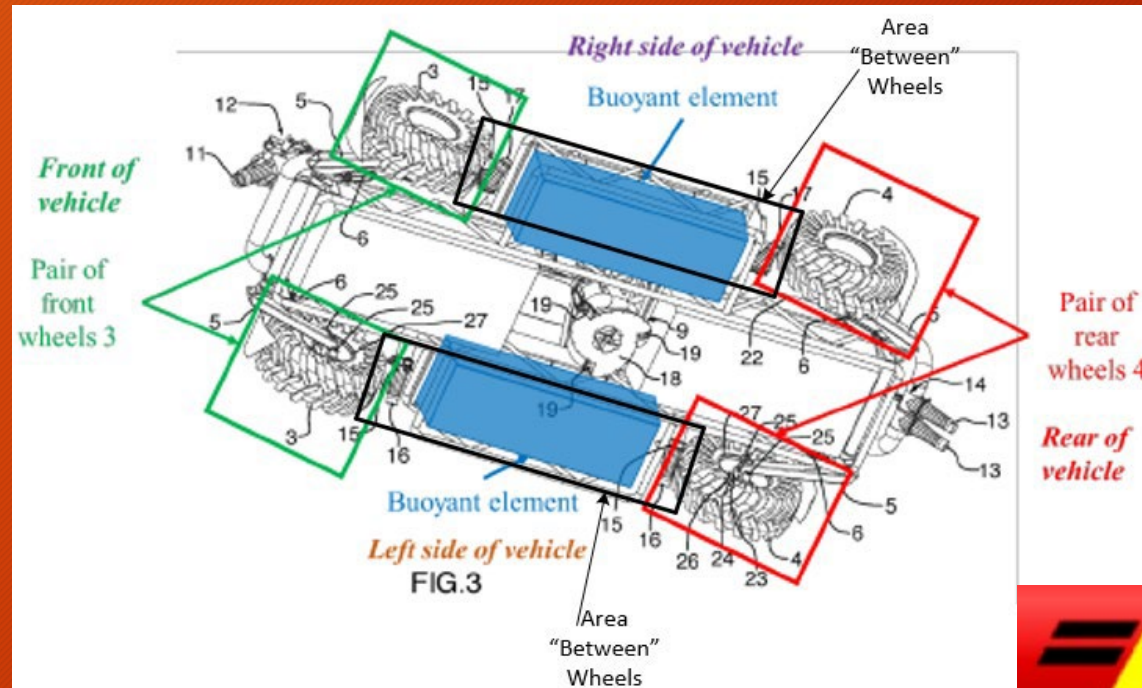
GROUND 1 - Claim 23 Is Not Anticipated by Bennett-II [EX1017]

30

Key Limitation: (1) Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle Body

Claim 23 of the '708 Patent

23. An amphibious vehicle comprising:
a floatable vehicle body comprising
buoyant elements having foam filled
buoyant chambers, the buoyant
elements comprising a first buoyant
element situated between a first front
wheel and a first rear wheel and a
second buoyant element between a
second front wheel and a second rear
wheel;



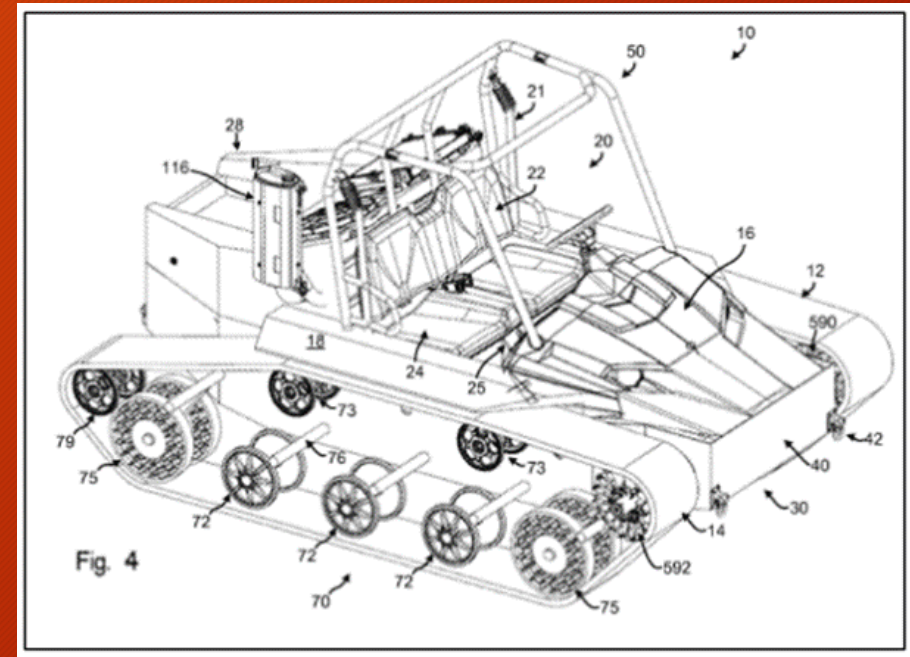
EX1001, p. 5,
Fig. 3.

GROUND 1 - Claim 23 Is Not Anticipated by Bennett-II [EX1017]

31

Bennett-II teaches tracks, not wheels Patent Owner's Expert:

138. Bennett-II explains that the track driving sprockets / “load wheels 75 are in contact with track members 12, 14.” [EX1017], Bennett-II, ¶[0063]. By contrast, the ‘708 Patent explains that “the ground engaging propulsion structure may comprise an endless track or a set of wheels” and that the wheels are “*ground engaging elements*.” [EX1001], ‘708 Patent, col. 2, ln. 7-11 (emphasis added). In my opinion, a POSITA would not consider the load wheels 75 in Bennett-II as the claimed “a first front wheel and a first rear wheel” and “a second front wheel and a second rear wheel” because they contact the tracks 12, 14 rather than the ground and when the ‘708 Patent explains that the vehicle has either tracks or wheels. In other words, a POSITA would understand



EX1017, p. 5, Fig. 4.

EX2099, ¶138.

GROUND 1 - Claim 23 Is Not Anticipated by Bennett-II [EX1017]

32

Bennett-II does not teach “foam filled buoyant chambers”
Petitioner’s Expert:

EX1018, ¶[0050]. Bennett-II describes that the tub 40 includes cross members 34 which separate the interior of the tub 40 into various chambers (shown below in green and blue). EX1017, ¶[0050]; EX1018, ¶[0049].

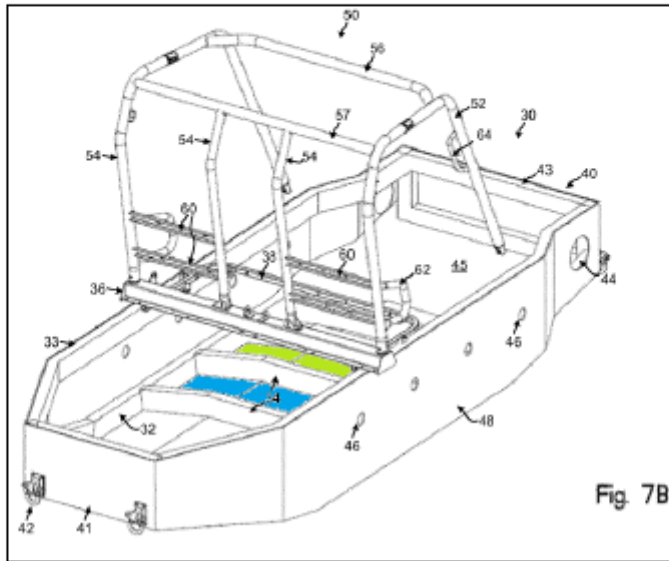


Fig. 7B

Bennett-II:

[0051] Longitudinal frame members 32, 33 and cross frame members 34 may be comprised of a metallic or polymeric material. Frame assembly 30 of FIGS. 7A-7C may be comprised of an aluminum material, for example 6061-T6 Aluminum. Similarly, tub 40 may be comprised of an aluminum material, for example 5052-H32 Aluminum. Alternatively, at least a portion of frame assembly 30 and/or tub 40 may include ultra-high molecular weight polyethylene. Additionally, frame assembly 30 and/or tub 40 may include a marine-grade pourable urethane coating and/or foam material inserts in order to fill volume voids and resist water ingestion during amphibious operation. As such,

EX1017, ¶[0051].

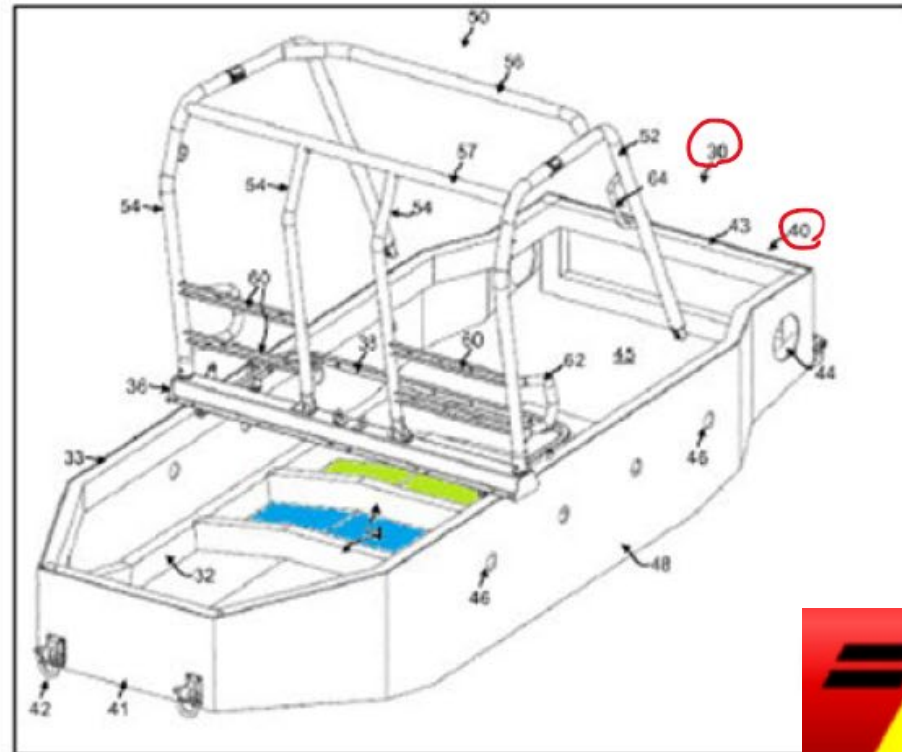
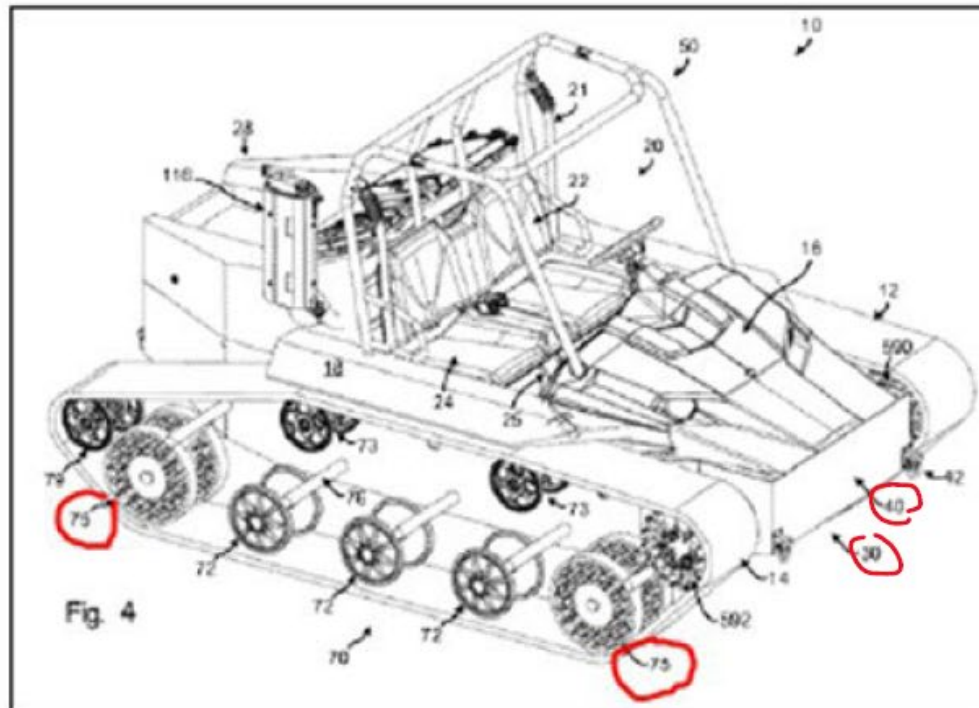
EX1004, ¶187.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

GROUND 1 - Claim 23 Is Not Anticipated by Bennett-II [EX1017]

33

The foam in Bennett-II is not “in the space that separates” the first front wheel & first rear wheel / the second front wheel & second rear wheel



EX1017, p. 5,
Fig. 4 and p. 9,
Fig. 7B.

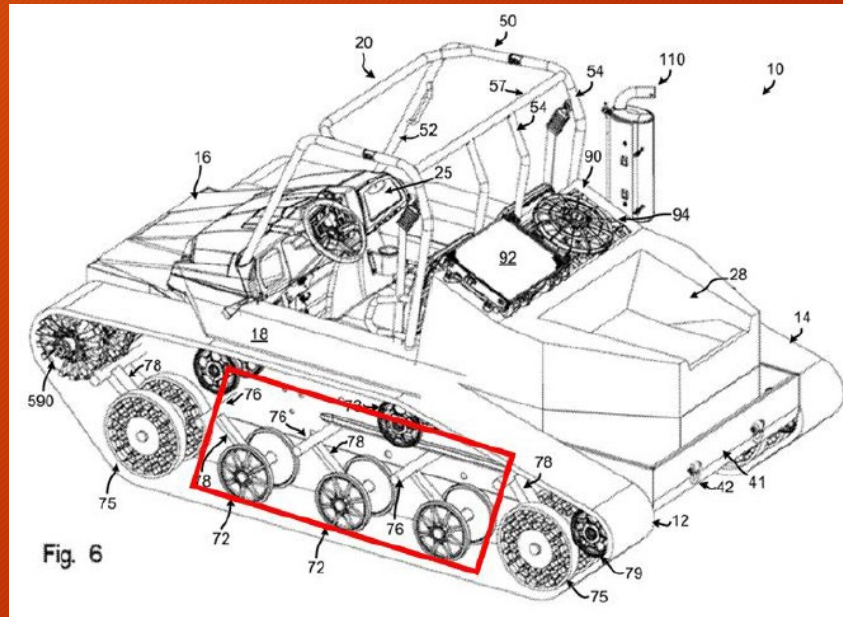
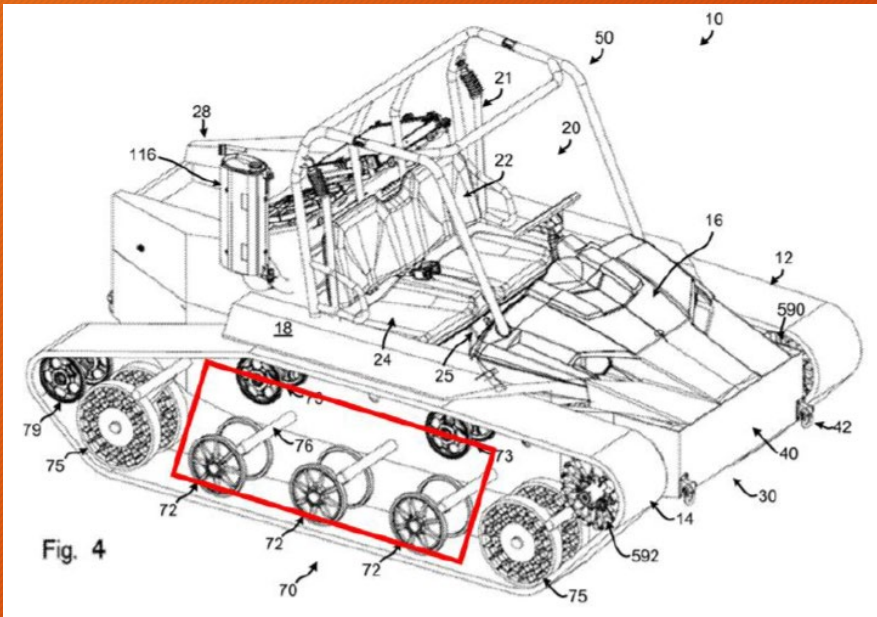
GROUND 1 - Claim 23 Is Not Anticipated by Bennett-II [EX1017]

34

Patent Owner's Expert:

144. In other words, to satisfy the claimed arrangement of foam filled buoyant chambers positioned in the space between the front wheel and the rear wheel on the each of the right and left sides of the vehicle body, Bennett-II would need to teach a wheeled alternative to its tracks with foam filled buoyant chambers positioned at the locations shown by the red boxes drawn in the annotated figures below:

EX2099, ¶138.



EX1017, p. 5, Fig. 4 and p. 7, Fig. 6.

GROUNDS 2, 3, 6, & 7 - Claims 1-38 Are Not Obvious based on Truxor [EX1006]/SenwaTec [EX1012] in view of Yoon [EX1011] or Carrier [EX1005] or in further view of Manure-Manager [EX1019]

Key Limitation: (1) Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle Body



Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
17. An amphibious vehicle comprising: a floatable vehicle body comprising a first buoyant element situated between the first front wheel and the first rear wheel and a second buoyant element between the second front wheel and the second rear wheel;	21. An amphibious vehicle comprising: a floatable vehicle body comprising a first buoyant element on a first side of the vehicle body and a second buoyant elements on a second side of the vehicle body; wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;	23. An amphibious vehicle comprising: a floatable vehicle body comprising buoyant elements having foam filled buoyant chambers, the buoyant elements comprising a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front wheel and a second rear wheel;

GROUND 2, 3, 6, & 7 - Claims 1-38 Are Not Obvious based on Truxor [EX1006]/SenwaTec [EX1012] in view of Yoon [EX1011] or Carrier [EX1005] or in further view of Manure-Manager [EX1019]

36

Truxor:

161. Truxor discloses a vehicle with tracks:



EX2099, ¶161.

[EX1006], Truxor, p. 3. Neither Petitioner nor Dr. Winkel refutes this point. Petition, p. 48, [EX1004], Winkel Decl., ¶215. Because Truxor discloses tracks rather than wheels, Truxor does not teach “a first front wheel and a first rear wheel” or “a second front wheel and a second rear wheel” as required by claims 17, 21, and 23.

GROUND 2, 3, 6, & 7 - Claims 1-38 Are Not Obvious based on Truxor [EX1006]/SenwaTec [EX1012] in view of Yoon [EX1011] or Carrier [EX1005] or in further view of Manure-Manager [EX1019]

SenwaTec:



A compact muscular vehicle with tracks



6-Wheel driven unit with stabilizer pontoons

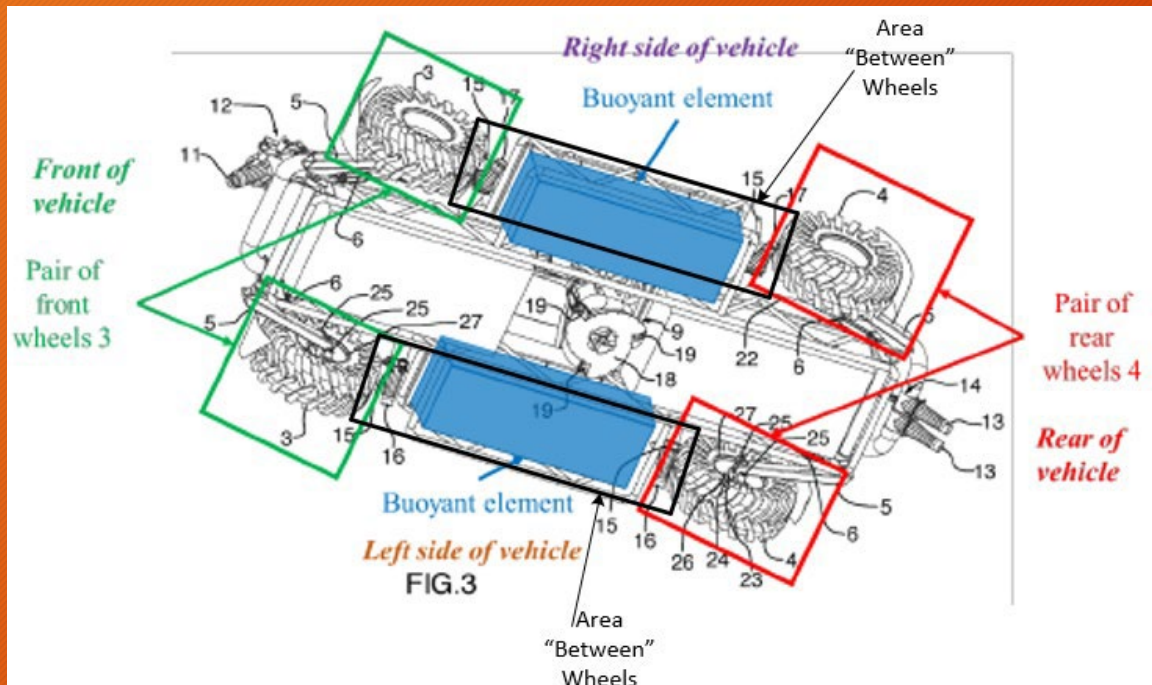
EX2099, ¶168;
EX1012, p.1.

[EX1012], SenwaTec, p. 1. This evidence shows that positioning the pontoons disclosed in Truxor outboard of the wheels would be the “natural location” a POSITA would have considered if they were motivated to convert Truxor from tracks to wheels and add buoyant elements to the vehicle.

GROUNDS 2, 3, 6, & 7 - Claims 1-38 Are Not Obvious based on Truxor [EX1006]/SenwaTec [EX1012] in view of Yoon [EX1011] or Carrier [EX1005] or in further view of Manure-Manager [EX1019]

38

Key Limitation: (1) Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle Body



VS.



GROUND 2, 3, 6, & 7 - Claims 1-38 Are Not Obvious based on Truxor [EX1006]/SenwaTec [EX1012] in view of Yoon [EX1011] or Carrier [EX1005] or in further view of Manure-Manager [EX1019]

Key Limitation: (2) Liquid Manure Pump



Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent
1. An amphibious vehicle comprising: an impeller in a liquid manure pump, the liquid manure pump comprising a bottom fluid inlet configured to be immersed in the liquid manure when the vehicle is floating, whereby the impeller is configured to draw liquid manure to be pumped through the bottom fluid inlet, the liquid manure pump comprising a housing with the bottom fluid inlet in the housing.	17. An amphibious vehicle comprising: a rotating shaft configured to move liquid manure in a liquid manure lagoon;	21. An amphibious vehicle comprising: a liquid manure pump comprising a pump housing and an impeller in the pump housing, wherein the impeller is immersed in a liquid manure lagoon when the vehicle is floating in the liquid manure lagoon;

GROUND 2, 3, 6, & 7 - Claims 1-38 Are Not Obvious based on Truxor [EX1006]/SenwaTec [EX1012] in view of Yoon [EX1011] or Carrier [EX1005] or in further view of Manure-Manager [EX1019]

40

Truxor:

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

EX1007, 123.



EX1006, 10.

GROUND 2, 3, 6, & 7 - Claims 1-38 Are Not Obvious based on Truxor [EX1006]/SenwaTec [EX1012] in view of Yoon [EX1011] or Carrier [EX1005] or in further view of Manure-Manager [EX1019]

SenwaTec's use in municipal (i.e., human) wastewater ponds $\neq$ liquid manure:



With the movements of an amphibian: Eckhard Funck cleans the sewage pond in Mecklar with a new and environmentally friendly technology while sailing and swimming. His frog-like device produces 60 horsepower. Photo: Kaschik

Ludwigsau. He doesn't mind his smelly job. With an amphibious vehicle, Eckhard Funck drives through the **sewage pond** near Mecklar and removes the sludge that has accumulated there within the past years.

This idea is not that far off: "After all, it's **not fecal matter** that's in the sewage sludge," explains the vehicle operator of the frog-like machine, "it's just dead bacteria that previously ate the fecal matter." Thus, what floats in the pond is anything but toilet waste.

EX1027, 3.

EX1027, 2.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

What makes liquid manure different than water?

42

Highly Corrosive:



Non-Newtonian Fluid with LARGE Suspended Solids:



EX2006, 2.

Paper 2,10.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE



GROUND 2, 3, 6, & 7 - Claims 1-38 Are Not Obvious based on Truxor [EX1006]/SenwaTec [EX1012] in view of Yoon [EX1011] or Carrier [EX1005] or in further view of Manure-Manager [EX1019]

Key Limitation: (3) Wireless Remote Control



Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
1. An amphibious vehicle comprising: a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon; and	17. An amphibious vehicle comprising: a wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.	21. An amphibious vehicle comprising: a wireless remote control configured to enable an operator remote from the vehicle to: (1) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (2) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon; and, (3) control a flow of liquid manure from the liquid manure pump.	23. An amphibious vehicle comprising: A wireless remote control configured to enable an operator remote from the vehicle to: (1) control the power source; (2) control at least one of the speed and direction of the vehicle when the vehicle is ground engaging; and, (3) control at least one of the speed and direction of the vehicle when the vehicle is floating in the liquid manure lagoon.

GROUNDS 2, 3, 6 & 7 - No Motivation to Combine Truxor [EX1006]/ SenwaTec [EX1012] with Yoon [EX1011] or Carrier [EX1005] and/or Manure- Manager [EX1019] with A Reasonable Expectation of Success

Truxor:



make it the ideal choice for working in and around water. Driven with care and with its minimal ground pressure, damage to river banks and sensitive areas can be minimised making the Truxor ideal for working on golf courses, nature reserves and public parks where larger, heavier machines have difficulty operating.

EX1006, 2.

Reed cutting & Gathering - Excavation - Dredging

EX1006, 1.

GROUNDS 2, 3, 6 & 7 - No Motivation to Combine Truxor [EX1006]/
SenwaTec [EX1012] with Yoon [EX1011] or Carrier [EX1005] and/or
Manure-Manager [EX1019] with A Reasonable Expectation of Success

45

SenwaTec:

Low ground pressure and good clearance on terrain, **marches and swamps** during on-land drives

EX1012, 1.



40 YEARS OF EXPERIENCE IN THE DEVELOPMENT OF:

- *DITCH CLEANER AND SLOPE MOWERS*
- *MOWING AND CLEARING BOATS*
- *WEED HARVESTERS*
- *AMPHIBIOUS VEHICLES*
- *CUTTER SUCTION AND EXCAVATING DREDGES*

EX1012, 1.

EX1012, 1.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

GROUNDS 2, 3, 6 & 7 - No Motivation to Combine Truxor [EX1006]/
SenwaTec [EX1012] with Yoon [EX1011] or Carrier [EX1005] and/or
Manure-Manager [EX1019] with A Reasonable Expectation of Success

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Manure-Manager [EX1019]:



=NUHN=

NEW

This pump features dual ported and tapered housing, as well as a tapered fan. It includes radio remote control, an oversized gear box with oil cooler, a fully enclosed drive line, a hardened and balanced drive shaft, and a modular design. Experience the fastest load times in the industry.

G-Force Vertical Pit Pump

Top Load Tandem

Vacuum Transfer Boom

Quad Train Vacuum

For a quote, and your local dealer, contact us at (877) 837-7323 or email nuhnind@nuhn.ca

For a demonstration, visit www.nuhn.ca

EX1019, p. 27. The vertical pit pump pictured in this advertisement has an overall length of approximately 17 feet, 9 inches, a boom arm that is approximately 11 feet long, a weight of approximately 2,560 pounds, and a minimum horsepower requirement of 95 horsepower. Nuhn's multi-outlet pump design was also

EX2083, ¶8.

EX1019, p. 27.

GROUND 2, 3, 6 & 7 - No Motivation to Combine Truxor [EX1006]/
SenwaTec [EX1012] with Yoon [EX1011] or Carrier [EX1005] and/or Manure-
Manager [EX1019] with A Reasonable Expectation of Success

Truxor:

Technical Data: **Truxor DM 5000**

Engine: Daihatsu **35 hp** diesel, Environment Class
Euro 2

EX1006, p. 3.

Patent Owner's Expert:

EX1006 at 3. It is my understanding that Nuhn's G-Force Vertical Pit Pump shown in Manure-Manager [EX1019] and Nuhn's Header Series Lagoon Pump shown in Manure-Manager-II [EX1020] have a minimum horsepower requirement of 95 hp. [EX2083] at ¶ 8. **Because Truxor's engine only outputs 35 hp, a POSITA would not have attempted to use Nuhn's G-Force Vertical Pit Pump or Nuhn's Header Series Lagoon Pump with such an underpowered engine in Truxor that could not provide the specified minimum horsepower.** Additionally, a POSITA would not

EX2099, ¶386.



GROUND 2, 3, 6 & 7 - No Motivation to Combine Truxor [EX1006]/ SenwaTec [EX1012] with Yoon [EX1011] or Carrier [EX1005] and/or Manure- Manager [EX1019] with A Reasonable Expectation of Success

SenwaTec:

- ❖ **Forward crane ready for many attachments with available power for up to 50 KW (67 HP)**

Engine:	❖ Powerful Diesel engine with 55 KW/74 HP @ 2200 RPM, temperature & oil pressure monitoring system
---------	--

EX1012, p. 1 and 3.

Patent Owner's Expert:

horsepower). EX1012 at 1. It is my understanding that Nuhn's G-Force Vertical Pit Pump shown in Manure-Manager [EX1019] and Nuhn's Header Series Lagoon Pump shown in Manure-Manager-II [EX1020] have a minimum horsepower requirement of 95 hp. [EX2083] at ¶ 8.

Because SenwaTec's engine only outputs 74 hp and its forward crane can only provide 67 hp, a POSITA would not have attempted to use Nuhn's G-Force Vertical Pit Pump or Nuhn's Header Series Lagoon Pump with such an underpowered engine in SenwaTec that could not provide the specified minimum horsepower. Additionally, a POSITA would not consider Petitioner's proposed

EX2099, ¶432.

GROUND 2, 3, 6 & 7 - No Motivation to Combine Truxor [EX1006]/ SenwaTec [EX1012] with Yoon [EX1011] or Carrier [EX1005] and/or Manure-Manager [EX1019] with A Reasonable Expectation of Success

Patent Owner's Expert on adding remote control:

186. Manure lagoons typically have steep embankments that can be covered in manure, mud, sand, and/or ice and are therefore extremely slippery. See [EX1004], Winkel Decl., ¶280 (acknowledging "the problem of launching vessels in area lacking launching infrastructure"). A POSITA would recognize that **Truxor's known instability issues would be exacerbated by remote control**. As a result, a POSITA would not have had a reasonable expectation that adding remote control functionality to Truxor would be successful in producing an amphibious remote-controlled vehicle that could operate in a manure lagoon environment without tipping.

EX2099, ¶186.



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

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

EX1007, 128.

Potential Rollover Risk

EX1006, 5; *see also* EX1020-EX1021, 1; EX1022, 8.



EX1004, ¶248.

GROUND 2, 3, 6 & 7 - No Motivation to Combine Truxor [EX1006]/ SenwaTec [EX1012] with Yoon [EX1011] or Carrier [EX1005] and/or Manure-Manager [EX1019] with A Reasonable Expectation of Success

50

Patent Owner's Expert on adding remote control:

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

EX2099, ¶226.



EX1012, 2.

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

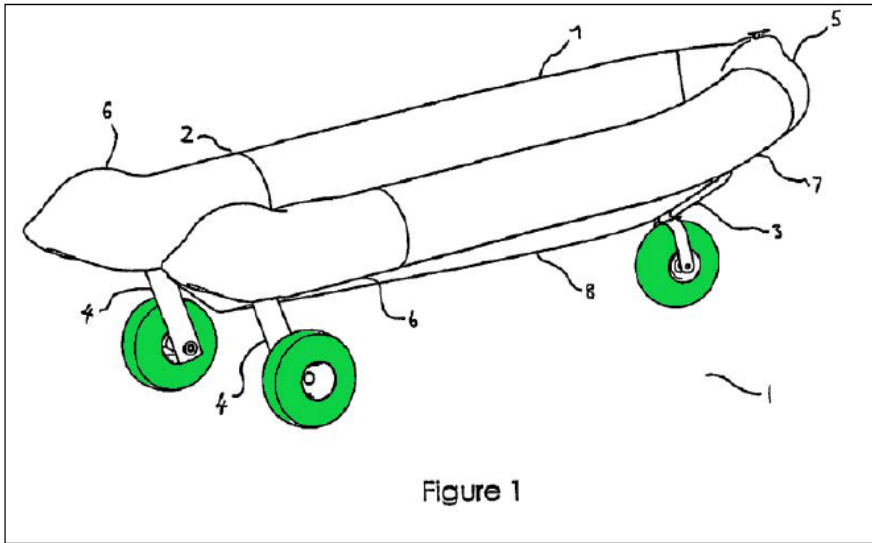
Key Limitation: (1) Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle Body (Claims 17, 21, and 23)



Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
17. An amphibious vehicle comprising: a floatable vehicle body comprising a first buoyant element situated between the first front wheel and the first rear wheel and a second buoyant element between the second front wheel and the second rear wheel;	21. An amphibious vehicle comprising: a floatable vehicle body comprising a first buoyant element on a first side of the vehicle body and a second buoyant elements on a second side of the vehicle body; wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;	23. An amphibious vehicle comprising: a floatable vehicle body comprising buoyant elements having foam filled buoyant chambers, the buoyant elements comprising a first buoyant element situated between a first front wheel and a first rear wheel and a second buoyant element between a second front wheel and a second rear wheel;

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

Petitioner's First Expert Declaration:

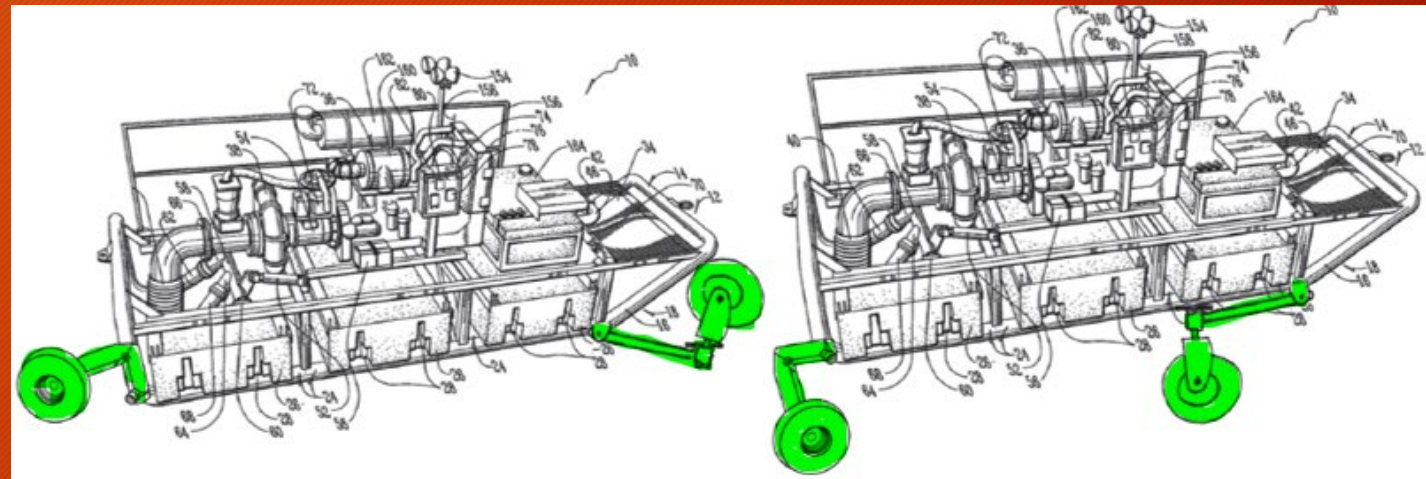


Id., FIG. 1 (annotated).

294. It would have been a matter of design choice for a POSA to use four independently-powered wheels, especially given Puck's rectangular shape, and Bryham teaches at least three independently-powered wheels, including four

EX1004, ¶¶293-294.

Petitioner's Second Expert Declaration:



EX1079, ¶168.

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

Patent Owner's Expert:

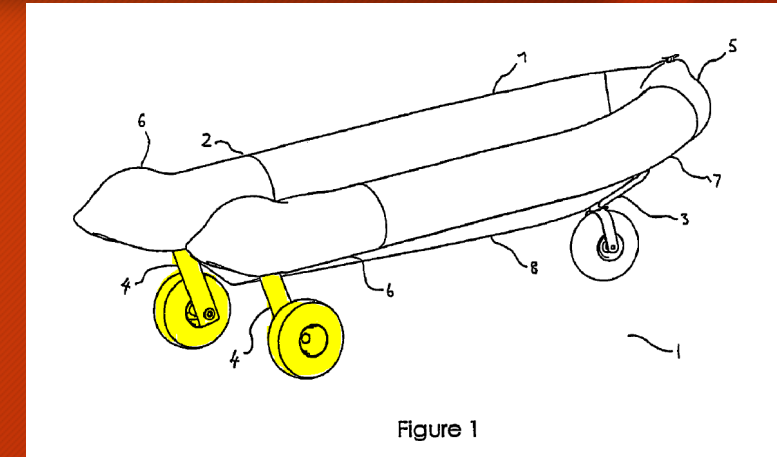
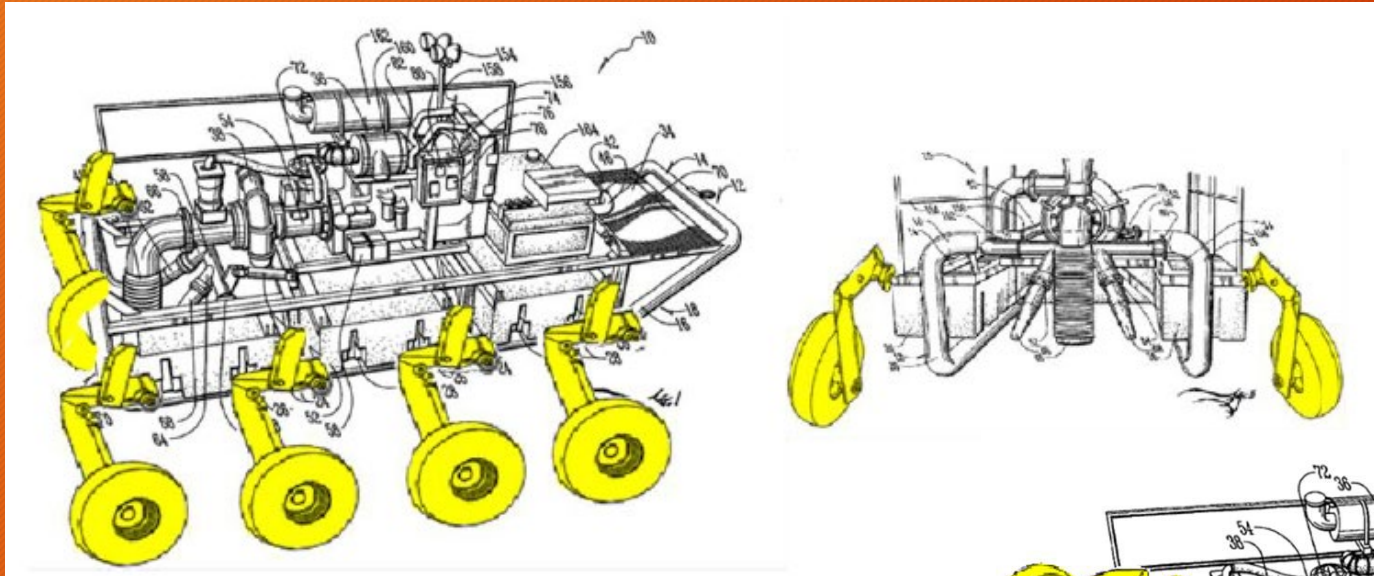
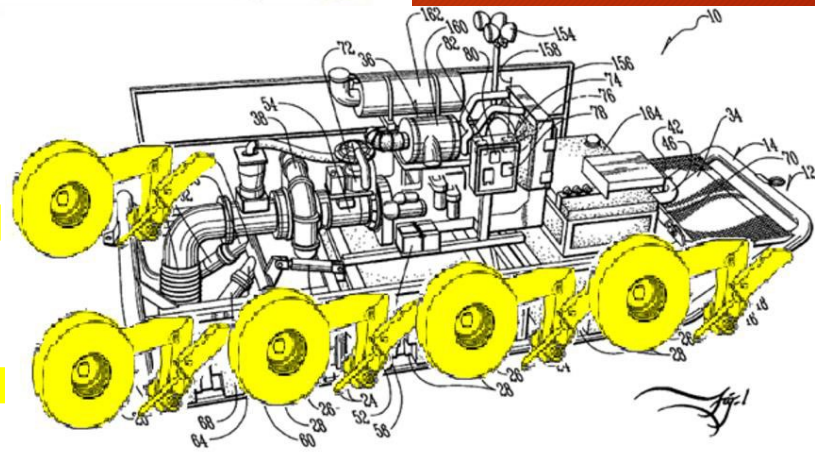


Figure 1

EX1015, p. 2,
Fig. 1.

261. Thus, if a POSITA were somehow motivated to add multiple sets of Bryham's rear wheels to Puck's boat, and followed the teachings of other wheeled amphibious vehicles (like Carrier I, Carrier II, and SenwaTec), then Bryham's wheels would be placed in rows along the opposing sides of Puck's frame (as opposed to in front of the frame and behind the frame as Petitioner and Dr. Winkel suggest). Thus, the resulting combination, if made, would not include buoyant elements positioned in the fore-and-aft space between the wheels on each side of the vehicle as required by Claims 17 and 23.



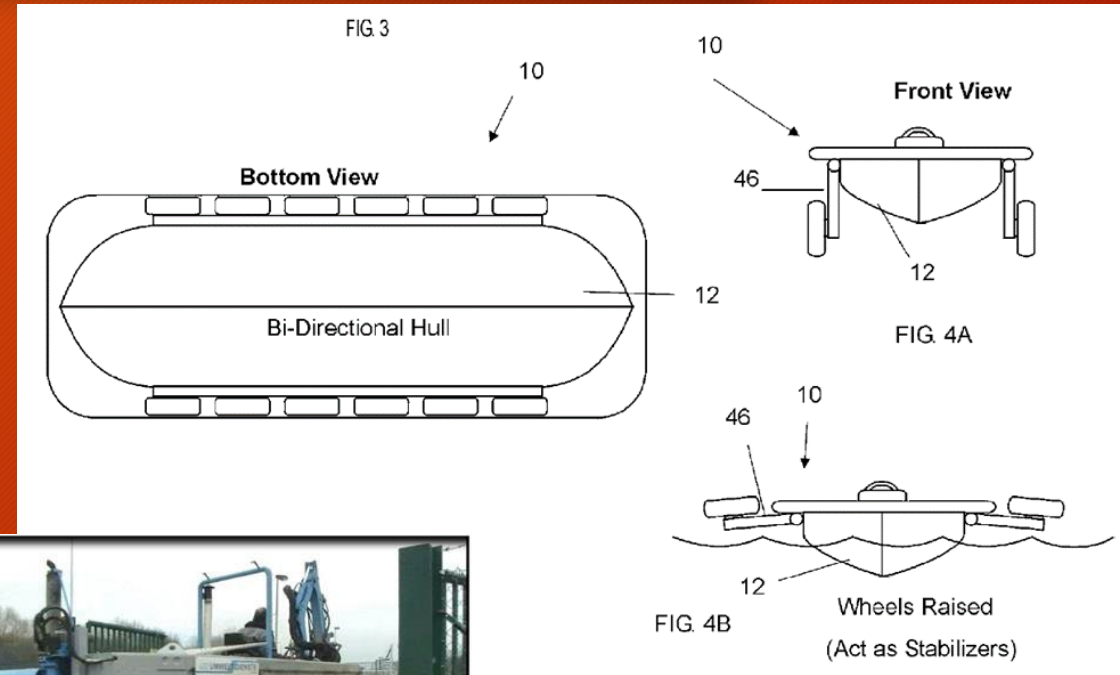
EX2099, ¶¶260-261.

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

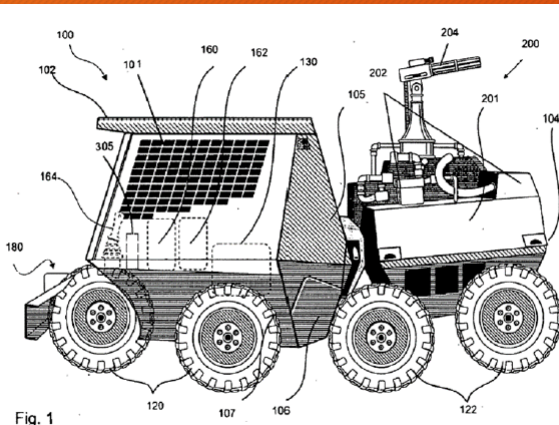
Patent Owner's Expert:

261. Thus, if a POSITA were somehow motivated to add multiple sets of Bryham's rear wheels to Puck's boat, and followed the teachings of other wheeled amphibious vehicles (like Carrier I, Carrier II, and SenwaTec) then Bryham's wheels would be placed in rows along the opposing sides of Puck's frame (as opposed to in front of the frame and behind the frame as Petitioner and Dr. Winkel suggest). Thus, the resulting combination, if made, would not include buoyant elements positioned in the fore-and-aft space between the wheels on each side of the vehicle as required by Claims 17 and 23.

EX2099, ¶261.



EX1020, p. 4, Figs. 3, 4A, 4B.



6-Wheel driven unit with stabilizer pontoons



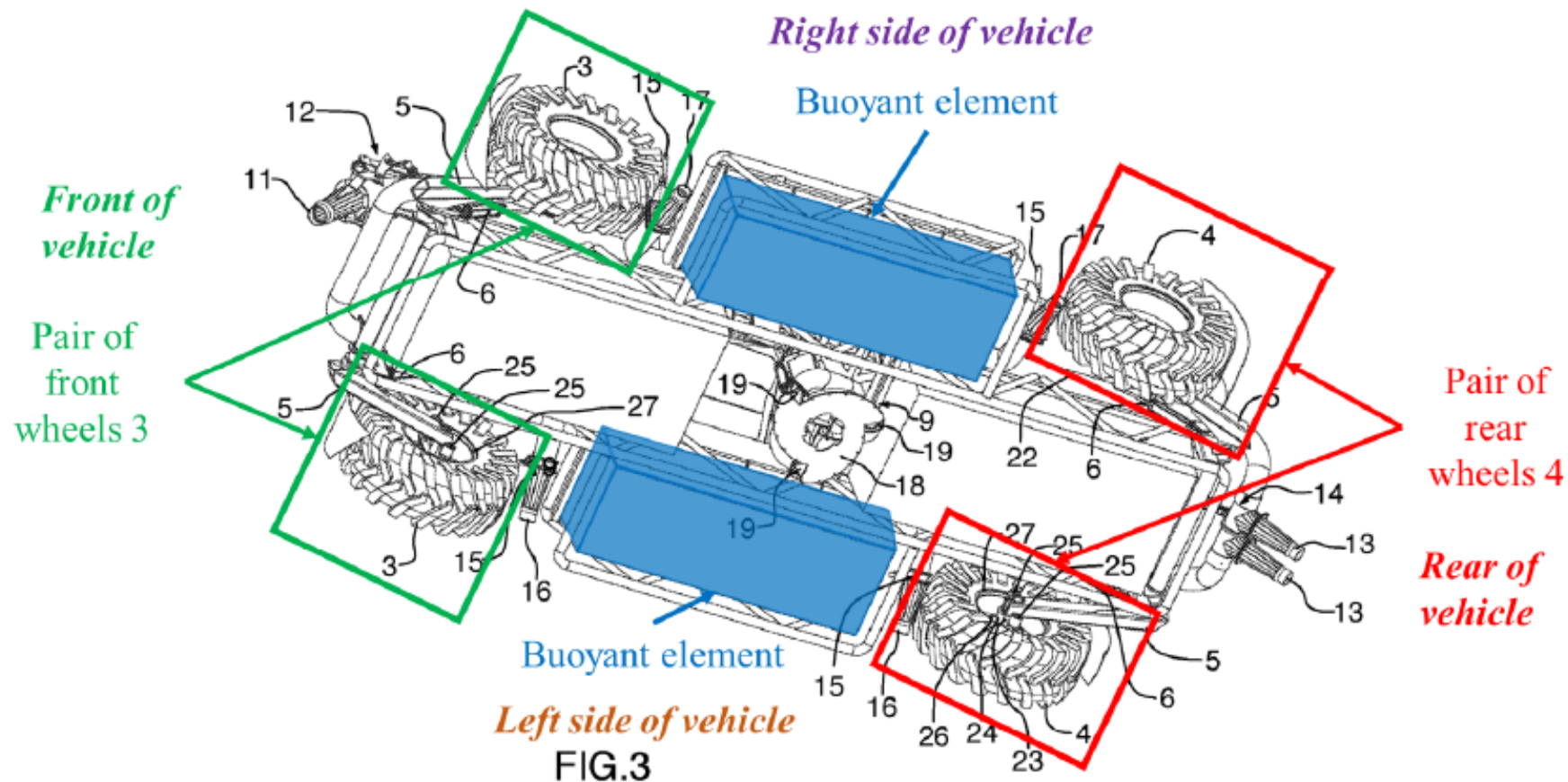
EX1005, p. 2, Fig. 1.

EX1012, p. 1; EX1013, p. 15.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Key Limitation: (1) Buoyant Elements Positioned Between the Front Wheel and Rear Wheel on Each Side of the Vehicle Body (Claims 17, 21, and 23)

55



EX2099, ¶105.



GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

56

Key Limitation: (2) Liquid Manure Pump and Associated Structure (e.g., impeller, housing, immersible bottom fluid inlet in the housing)



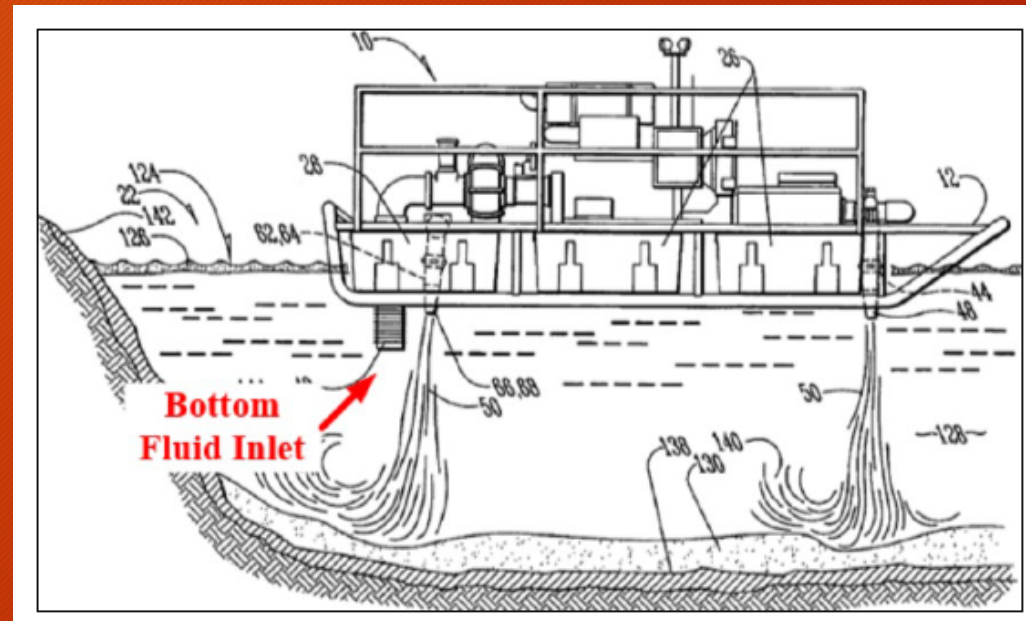
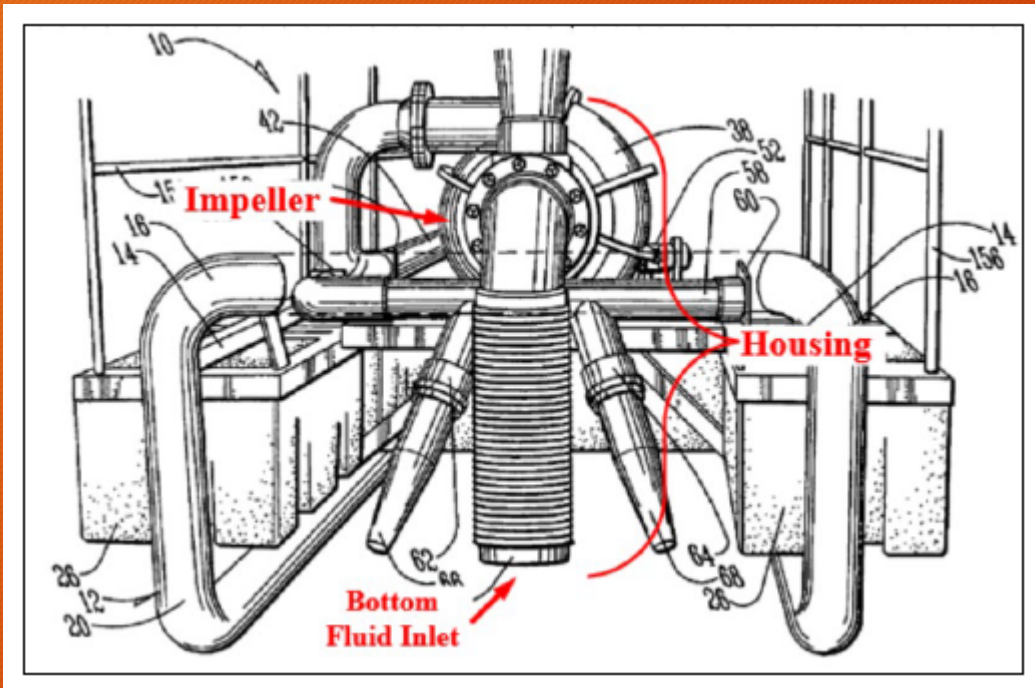
Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent
1. An amphibious vehicle comprising: an impeller in a liquid manure pump, the liquid manure pump comprising a bottom fluid inlet configured to be immersed in the liquid manure when the vehicle is floating, whereby the impeller is configured to draw liquid manure to be pumped through the bottom fluid inlet, the liquid manure pump comprising a housing with the bottom fluid inlet in the housing.	17. An amphibious vehicle comprising: a rotating shaft configured to move liquid manure in a liquid manure lagoon;	21. An amphibious vehicle comprising: a liquid manure pump comprising a pump housing and an impeller in the pump housing, wherein the impeller is immersed in a liquid manure lagoon when the vehicle is floating in the liquid manure lagoon;

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

57

Puck does not have an immersible bottom fluid inlet in the housing

Petitioner's Expert:



EX1004, ¶291.

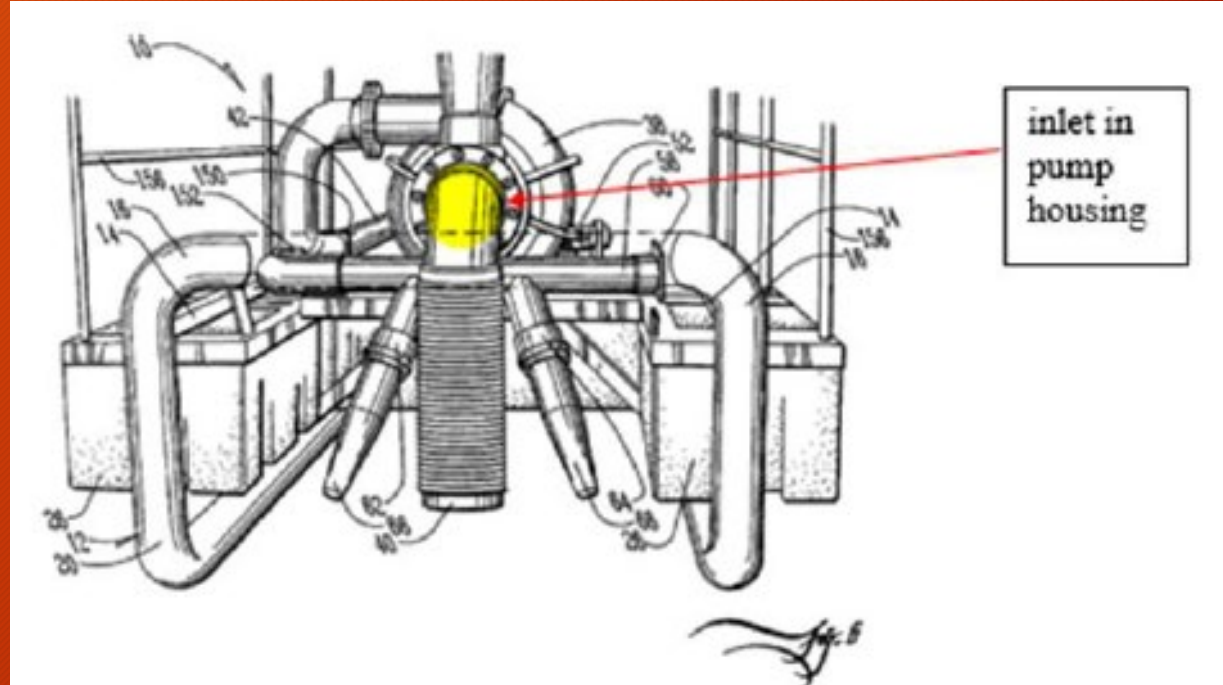
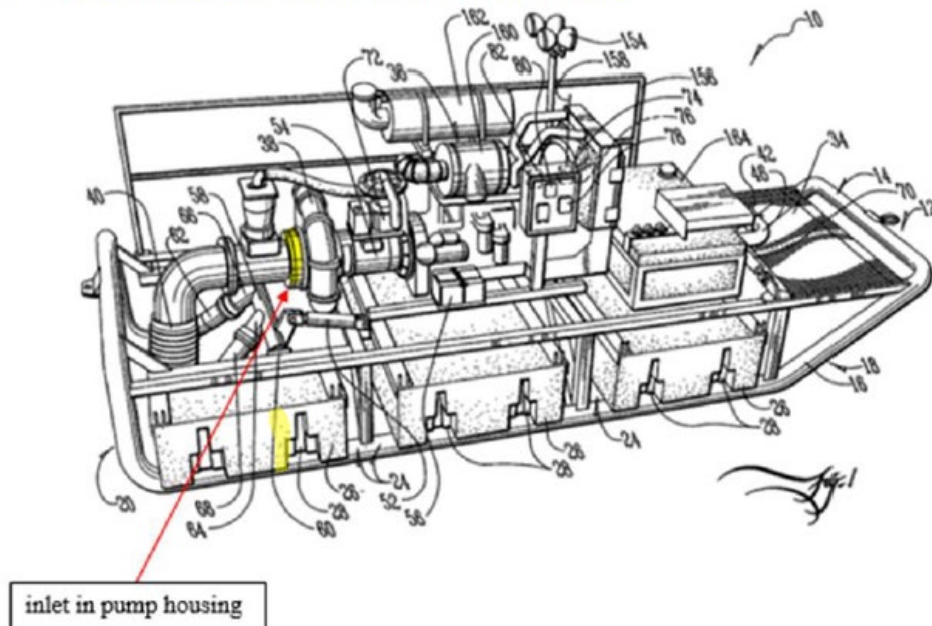
EX1004, ¶291.

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

58

Puck does not have an immersible bottom fluid inlet in the housing
Patent Owner's Expert:

247. Instead, a POSITA would understand Puck to disclose a slurry pump 38 with an inlet that is positioned in the rear side of the pump housing:

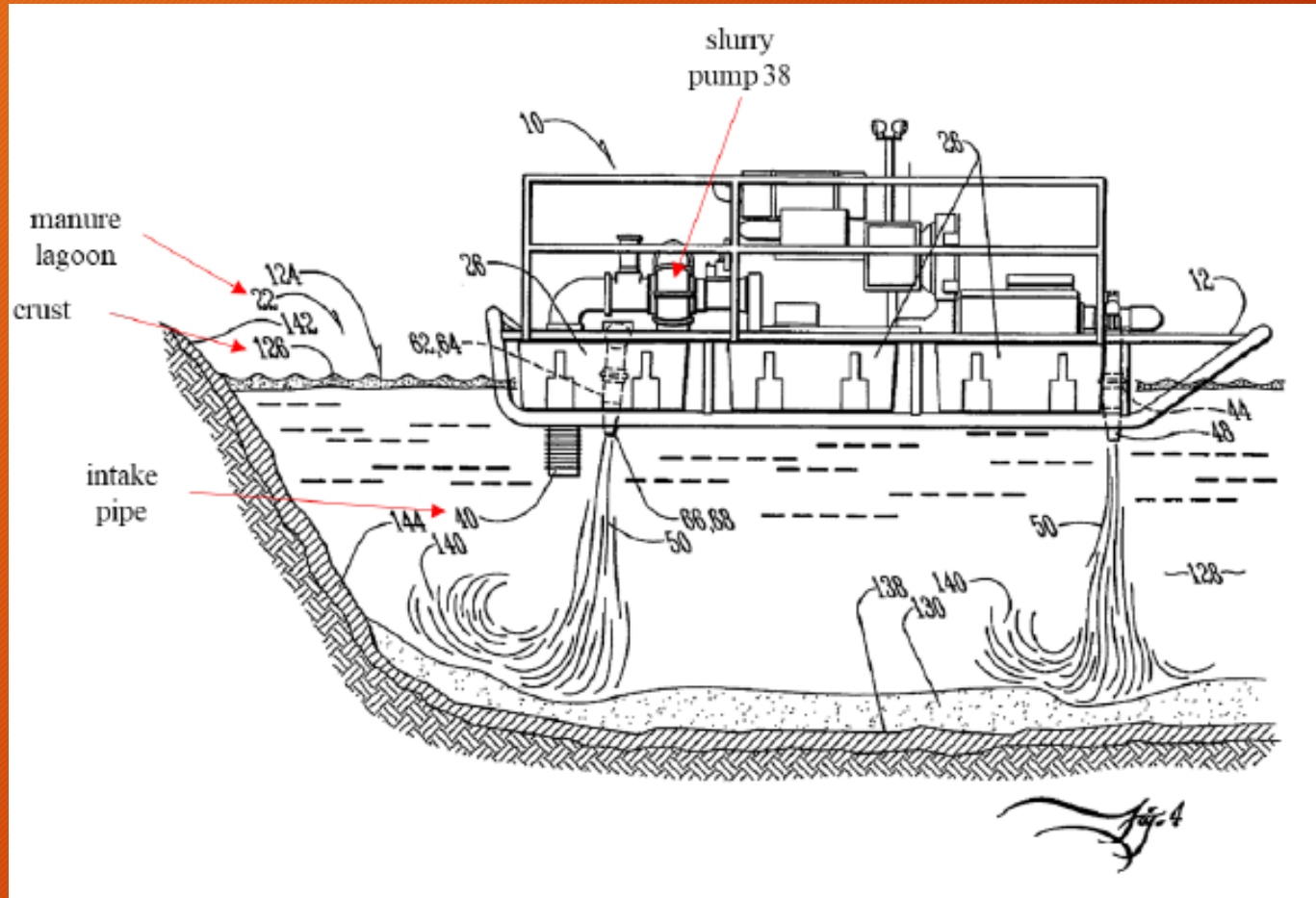


EX2099, ¶247.

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

59

Puck:

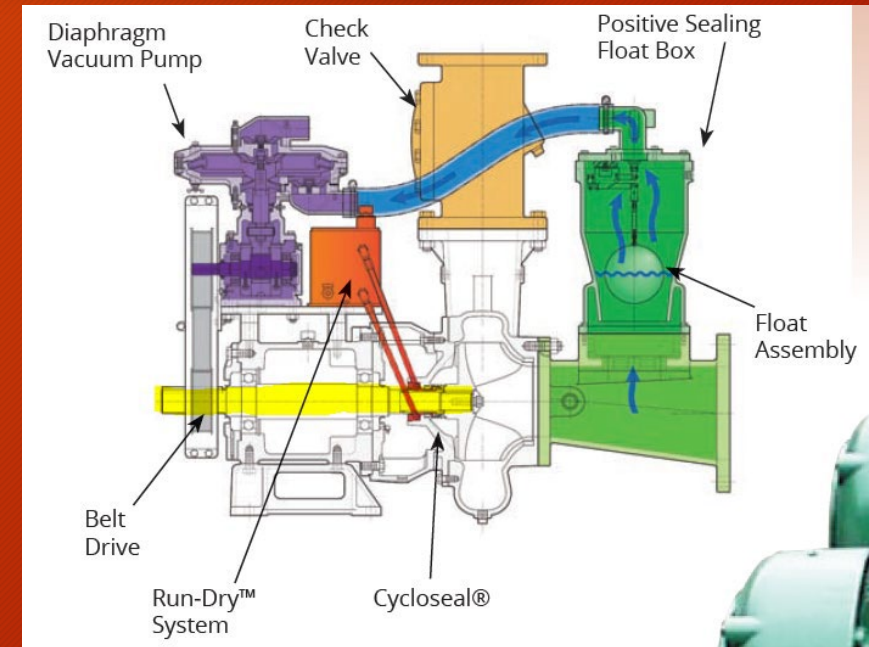
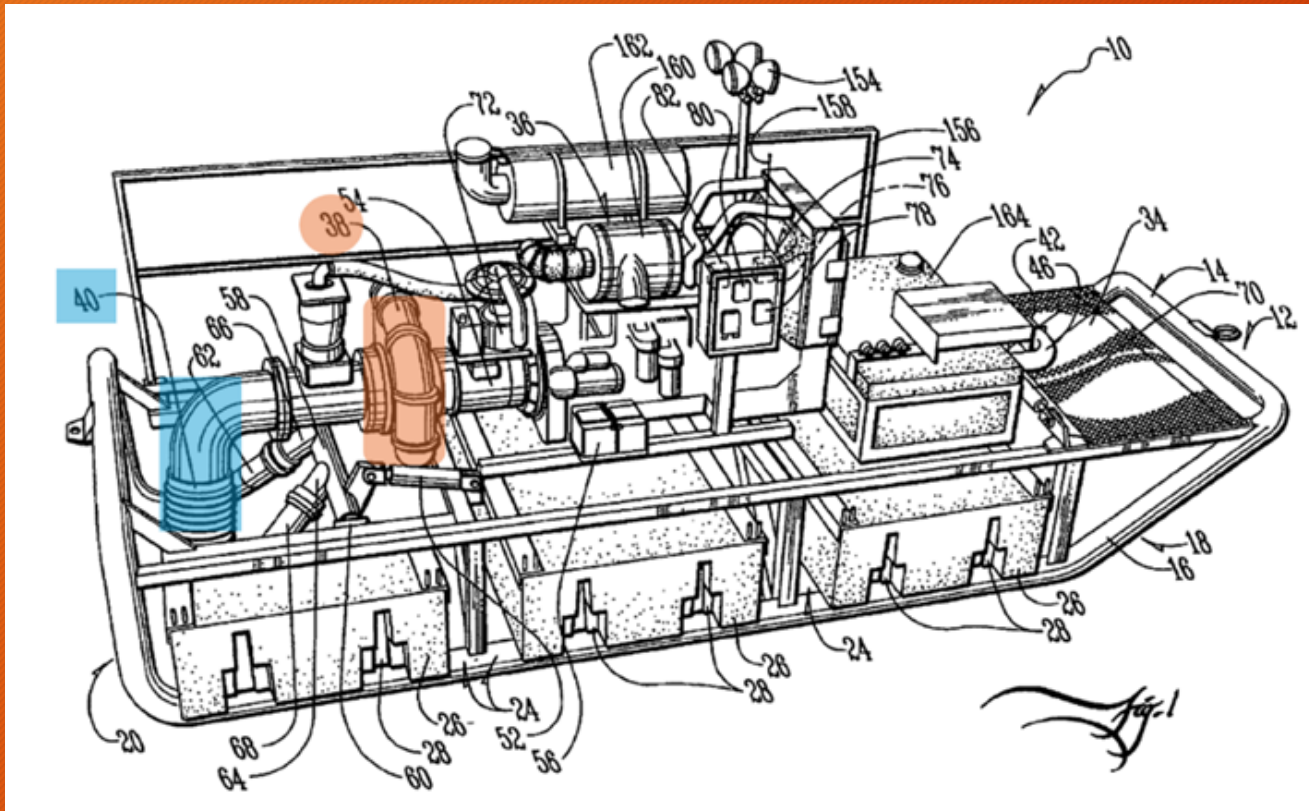


EX1014, p. 5,
Fig. 4.

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

60

Puck (EX1014):



EX1134, p. 2.

EX1014.

Key Limitation: (2) Liquid Manure Pump and Associated Structure (e.g., impeller, housing, immersible bottom fluid inlet in the housing)

61

Claims 1 and 21, and Claim 17 (partial)

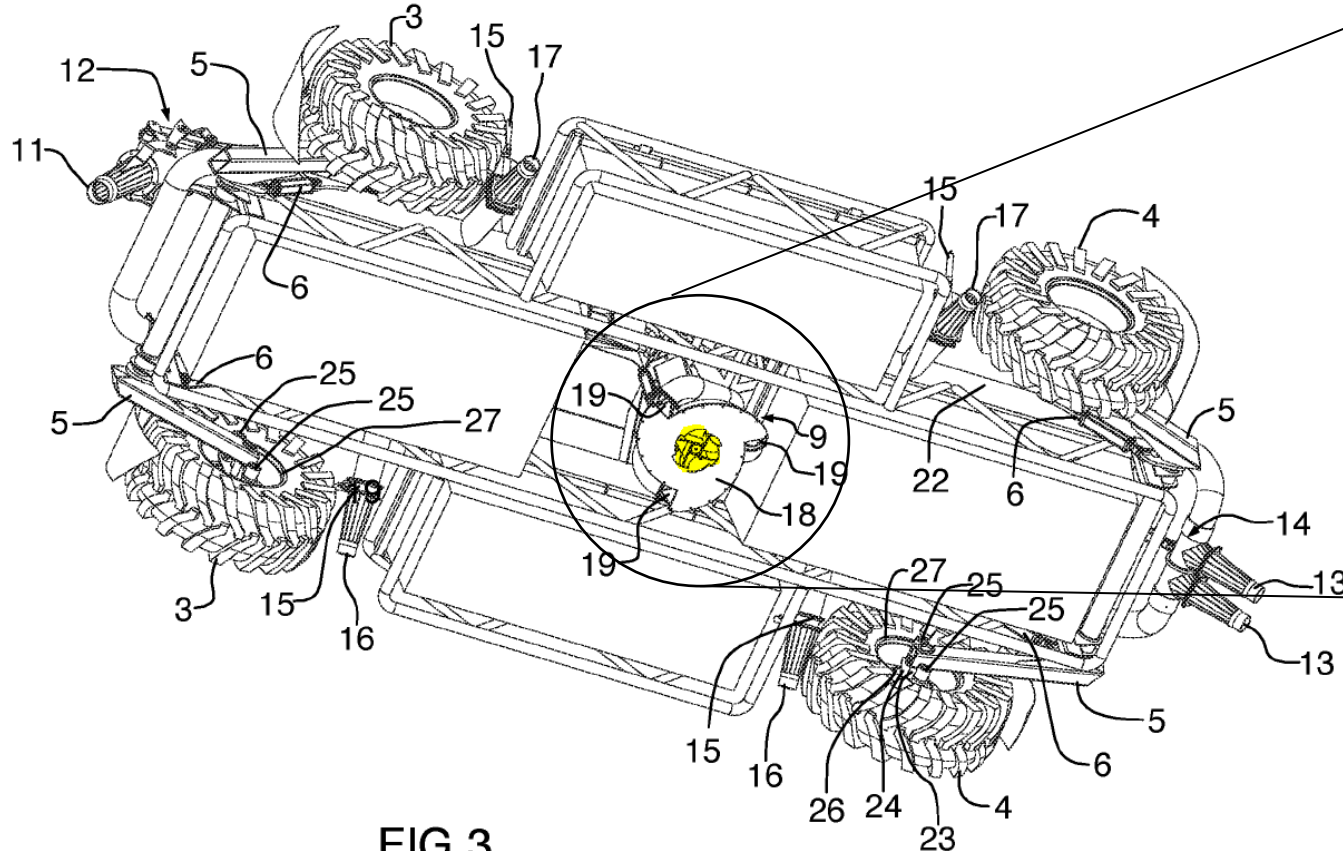


FIG. 3

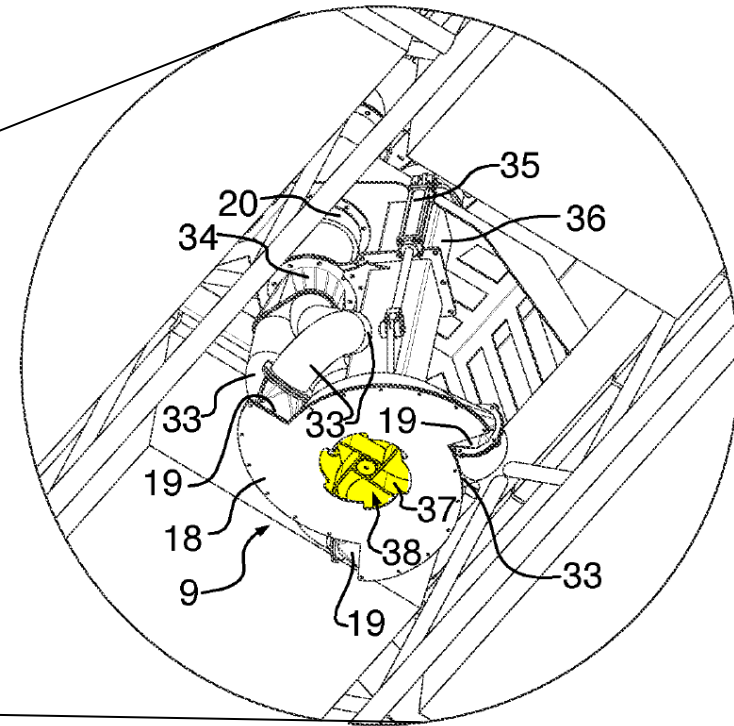


FIG. 8

EX1001, p. 9,
Fig. 8.

EX1001, p. 5, Fig. 3.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE



GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

Key Limitation: (4) Power Source Providing Power to Move the Vehicle Both When Ground Engaging and Floating (Claims 1, 17, 21, and 23)

Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
1. An amphibious vehicle comprising: a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in a liquid manure lagoon;	17. An amphibious vehicle comprising: a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in the liquid manure lagoon; and	21. An amphibious vehicle comprising: a power source configured to provide power to both the ground engaging propulsion structure and the liquid manure pump; and	23. An amphibious vehicle comprising: a power source configured to provide power to move the vehicle both when the vehicle is ground engaging and when the vehicle is floating in a liquid manure lagoon, and

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

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Petitioner's Expert:

the agitator. *Id.*, ¶[0037]. Rather than loading the vehicle with multiple engines, a POSA would have been motivated to use this high-powered internal combustion engine to power the ground engagement means of Bryham and the fluid pump of Puck. The high-powered engine of Puck would easily power each of these components, and doing so would have been cheaper, lighter, and more efficient than providing separate engines for each component.

EX1004, ¶267.

Puck:

The hydraulic cylinder (52) is coupled to a hydraulic pump (54) that, in turn, is coupled to a 12-volt battery (56). (FIGS. 1 and 5).

EX1014, ¶[0027].

Patent Owner's Expert:

obviously the best. Puck's hydraulic pump 54 is designed to operate hydraulic (linear) actuators 52 and would not have the capability to drive ground engaging wheels, which would require high-volume continuous flow with throttling. In particular, Puck discloses that "[t] hydraulic cylinder (52) is coupled to a hydraulic pump (54) that, in turn, is coupled to a 12-volt battery (56)." EX1014 at ¶ [0027]. A POSITA would immediately recognize that a hydraulic pump that is powered by a 12-volt battery, like the hydraulic pump 54 disclosed in Puck, would be insufficient to drive the hydraulically powered wheels of a vehicle.

EX2099, ¶268.

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

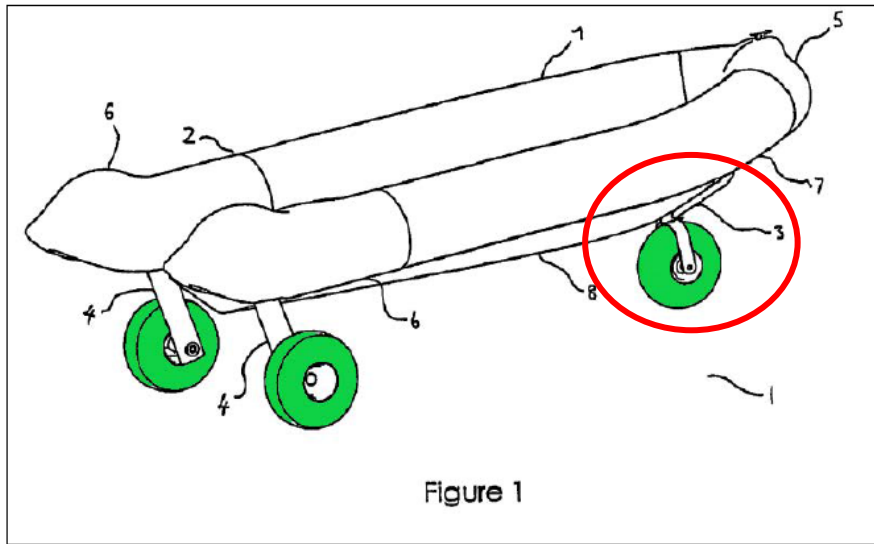
64

Key Limitation: (5) Four Variable Speed Hydraulic Motors, One Per Wheel (Claim 17)

Claim 1 of the '708 Patent	Claim 17 of the '708 Patent	Claim 21 of the '708 Patent	Claim 23 of the '708 Patent
1. An amphibious vehicle comprising: a ground engaging propulsion structure;	17. An amphibious vehicle comprising: four variable speed hydraulic motors, one variable speed hydraulic motor per wheel, for independently driving the wheels at variable speeds;	21. An amphibious vehicle comprising: a ground engaging propulsion structure comprising a first front wheel, a second front wheel, a first rear wheel, and a second rear wheel, wherein the first front wheel and the first rear wheel are on the first side of the vehicle body and the second front wheel and the second rear wheel are on the second side of the vehicle body, and wherein the first buoyant element is between the first front wheel and the first rear wheel and the second buoyant element is between the second front wheel and the second rear wheel;	23. An amphibious vehicle comprising: a ground engaging propulsion structure;

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

Petitioner's First Expert Declaration:

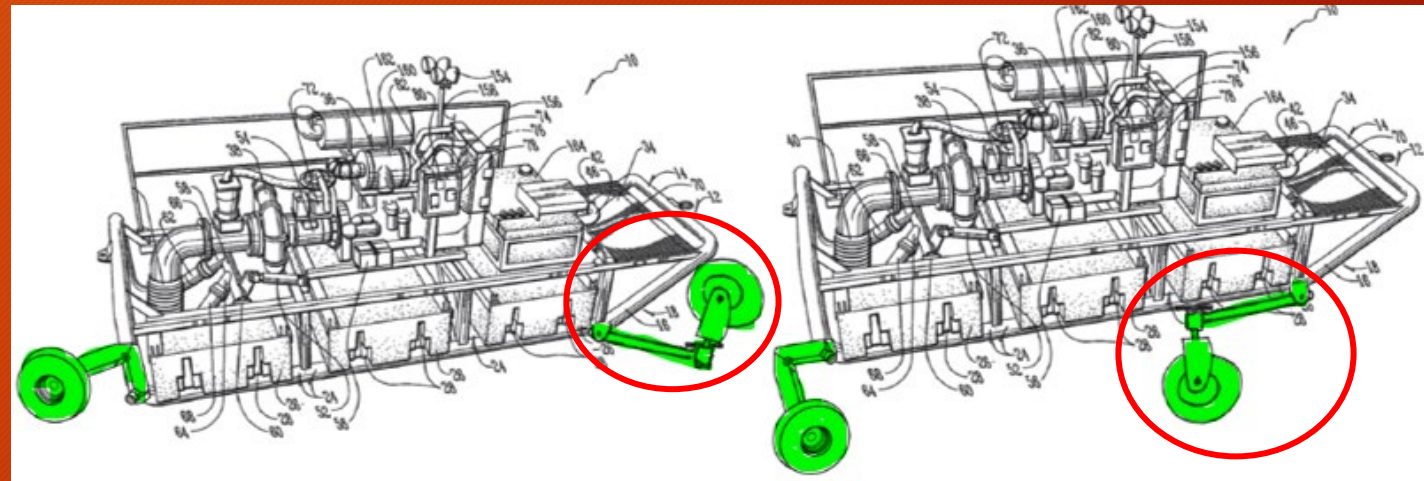


Id., FIG. 1 (annotated).

294. It would have been a matter of design choice for a POSA to use four independently-powered wheels, especially given Puck's rectangular shape, and Bryham teaches at least three independently-powered wheels, including four

EX1004, ¶¶293-294.

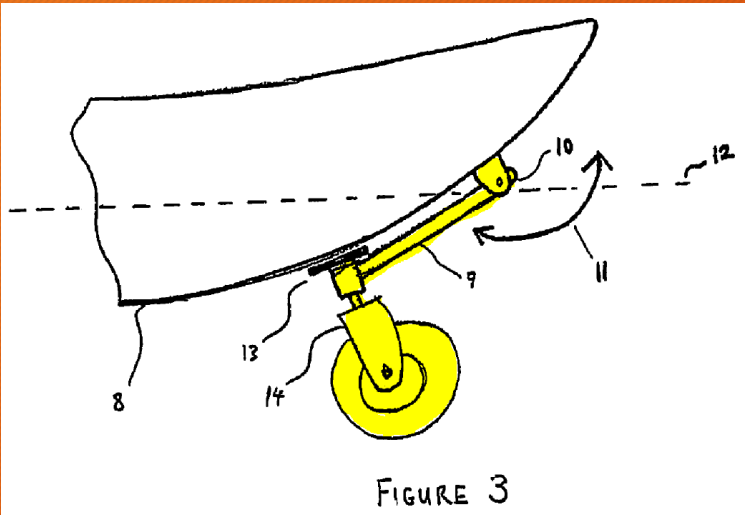
Petitioner's Second Expert Declaration:



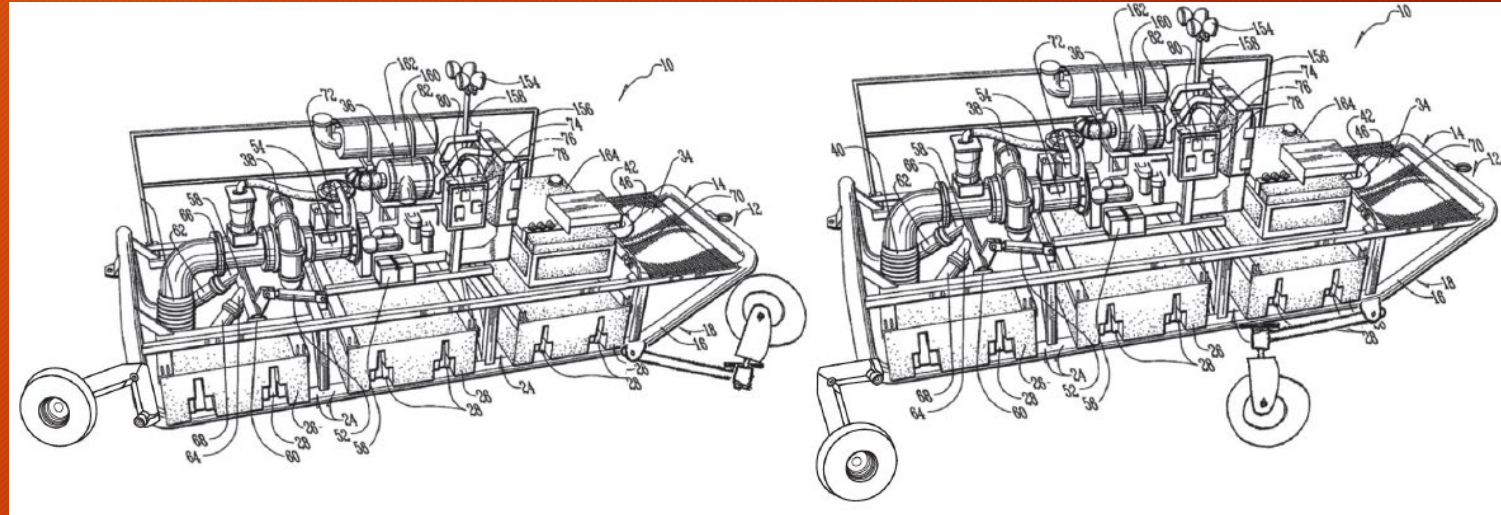
EX1079, ¶168.

GROUND 4, 5, and 8 - Claims 1-38 Are Not Obvious based on Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019]

Bryham:



Petitioner's Expert:



an inflatable craft, with an having a **three wheeled retractable undercarriage system**, having a **steerable front leg assembly**, and **two powered aft leg assemblies**, the ground engagement means being powered via drive trains within the leg assemblies.

EX1079, ¶168.

EX1015, 11:16-20 and Fig. 3.

GROUND 4, 5 & 8 - No Motivation to Combine Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019] with A Reasonable Expectation of Success

Petitioner's Expert on underlying motivation:

A. Motivation to Combine Puck and Bryham

276. A POSA would have been motivated to add the powered, steerable wheels of Bryham to Puck's boat to solve the problems users, especially single users, faced launching and retrieving Puck's boat within a toxic manure lagoon. The motivation to combine comes from the desire to make transporting, launching, and retrieving the Puck boat easier, safer and without having to put the trailer (let alone one's feet) in the corrosive manure lagoon. *Supra* Sections V.B.iv-V.C.

EX1004, ¶276.

GROUND 4, 5 & 8 - No Motivation to Combine Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019] with A Reasonable Expectation of Success

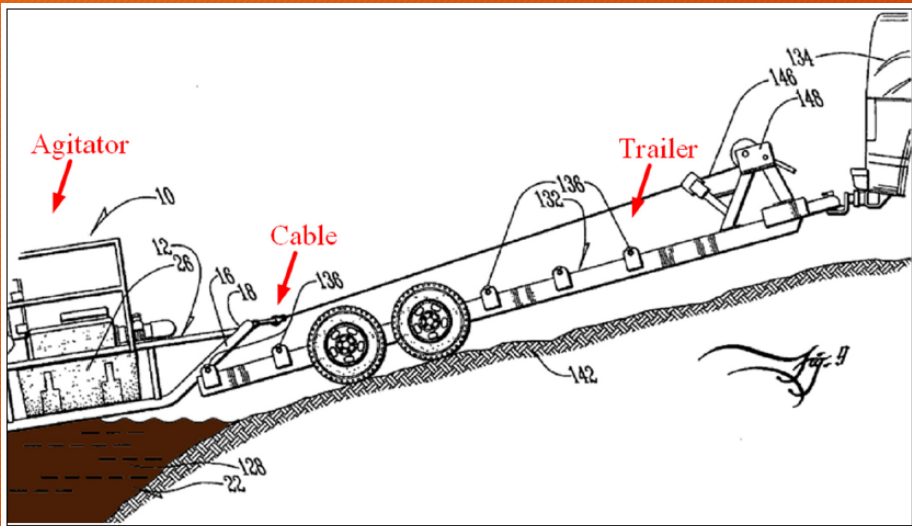
Puck's trailer:

sections (26) and the trailer is backed toward the lagoon (22). (FIGS. 1, 4, 8 and 9). Depending upon the angle of the trailer (132), the agitator (10) may roll off the trailer (132) by the force of gravity or may be manually pushed from the trailer (132) into the lagoon (22). If desired, the trailer (132) may be

EX1004, ¶277; EX1014, p. 10, Fig. 9.

EX2008, 7.

EX1014, ¶[0034].



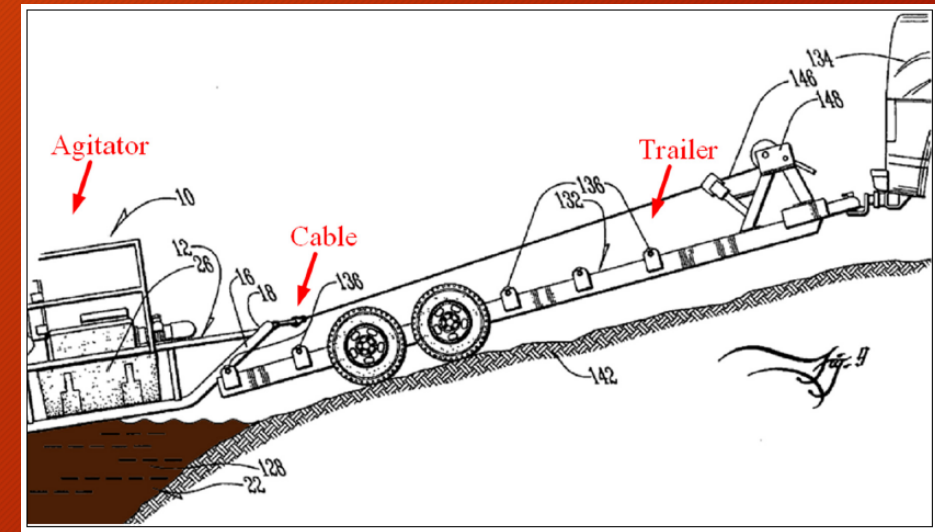
GROUND 4, 5 & 8 - No Motivation to Combine Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019] with A Reasonable Expectation of Success

69

Patent Owner's Expert:

275. A POSITA would recognize that the process of launching and retrieving Puck's boat does not require placing a trailer or one's feet into the hazardous and corrosive manure lagoon as Petitioner's expert incorrectly argues. See [EX1004], ¶276. Indeed, nothing of the sort is shown

words, if a POSITA were concerned that the "corrosive" environment of a manure lagoon might damage Puck's trailer and trailer wheels/bearings, that concern would lead them away from adding Bryham's wheels to Puck's manure lagoon agitation boat because the wheels, bearings, etc. of Bryham's ground engaging propulsion structure would be immersed and remain in the corrosive manure lagoon for the entire period of time during regular agitation sessions, which often take multiple hours. It is entirely illogical to believe that a POSITA that would be concerned about



EX1004, ¶277; EX1014, 10.

EX2099, ¶¶275, 279.

GROUND 4, 5 & 8 - No Motivation to Combine Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019] with A Reasonable Expectation of Success

70

Evidence of Skepticism RE: Feasibility of Hydraulically Powered Wheels

- a. the Lagoon Crawler's ground engaging structure (the wheels) were going to get stuck and become inoperative on solids in manure lagoons, impeding our ability to retrieve the Crawler;
- b. the Lagoon Crawler's ground engaging structure (the wheels) are going to leak inside of the liquid manure lagoon and cause the Crawler's hydraulic system to fill with manure thereby rendering the Crawler inoperable;
- c. the Lagoon Crawler's ground engaging structure (the wheels) will not have enough traction to be wireless remote controlled to drive out of the liquid manure lagoon; and

- a. the Lagoon Crawler's hydraulic system fittings are going to corrode, causing the Crawler to lose its oil;
- b. the structure of the Lagoon Crawler is going to be destroyed by the gases in the manure lagoon;

EX2083, ¶¶ 56-57.



GROUND 4, 5 & 8 - No Motivation to Combine Puck [EX1014] in view of Bryham [EX1015] or in further view of Bennett-II [EX1017] and/or Manure-Manager [EX1019] with A Reasonable Expectation of Success

71

Patent Owner's Expert:

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

291. In my opinion, a POSITA would recognize that the instability, steering, and traction issues with Bryham's ground engaging wheels would be exacerbated if remote control were added because remote control is less precise, has greater delay (latency), and it is much more difficult for the operator to perceive and counter tipping (i.e., remote control operators lack tactile feedback through the controls and or an on-board perception of sliding and tipping). While the operator

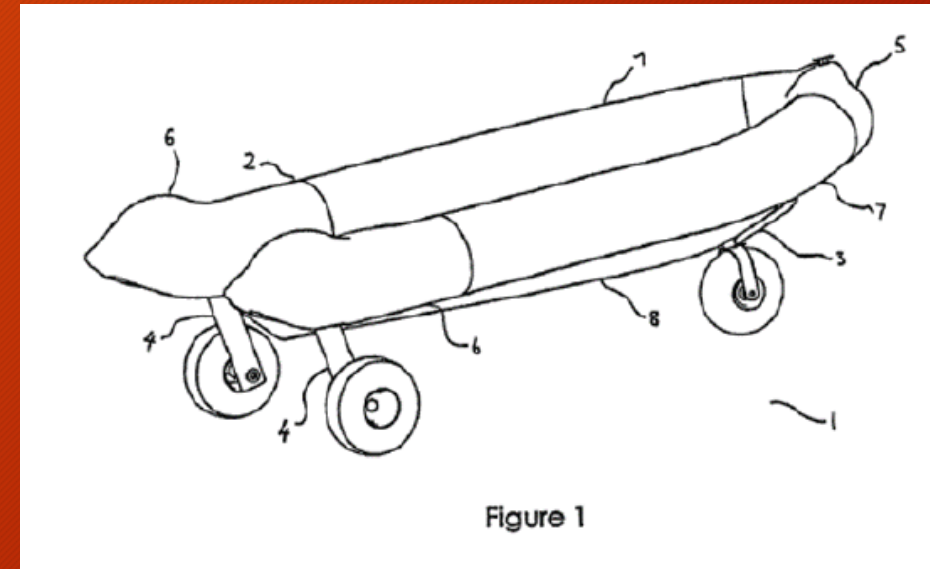


Figure 1

EX1015, p. 2,
Fig. 1.

EX2099, ¶¶ 251-252.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

GROUND 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Commercial Success

72

- Evidence of Commercial Success = Nuhn Declaration [EX2083], ¶¶23-28; Nuhn Sales Reports [EX2055-2059].
- Over 450 Lagoon Crawlers sold, Millions of Dollars in Revenue.
- Quickly Surpassed Puck - prior market share leader:

Prototype at the 2013 North American Manure Expo. Fast forward to today, my market research indicates that the market share for Nuhn's Lagoon Crawler has totally eclipsed the market share for Puck's pumping boat. Based on my

EX2083, ¶27.

GROUNDS 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Long Felt Need

73

Evidence of Long Felt Need = Nuhn Declaration [EX2083], ¶¶17-20, Prairie Declaration [EX2099], ¶¶700-702; [EX1001].

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

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

18. A typical lagoon has a berm that requires navigation both up and then back down, whereas Puck's design required a trailer to launch the boat. Compounding this difficulty was the fact that the terrain around a lagoon is often muddy and wet. A typical problem with Puck's boat was that it would get stuck on the bank or enter the lagoon too quickly and nosedive under the liquid.

19. Relatedly, Puck's boat was often ineffective in breaking up thick crust and navigating through portions of a lagoon, either because it could not break through the thick crust and vegetation floating on the surface of the lagoon or it got stuck (i.e., "beached") in the sludge at the bottom of the lagoon or on "islands" of solid buildup in the lagoon.

EX2083, ¶¶ 18-19.

EX1001, 1:38-54.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE



GROUPS 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Unexpected Results

74

Evidence of Unexpected Results = Prairie Declaration [EX2099], ¶¶703-707; Nuhn Declaration [EX2083], ¶¶29-33; Product Videos [EX2006; EX2007].



EX2007, 3.

EX2006, 2.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

GROUND S 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Praise

75



Angle Iron

A WEEKLY LOOK AT **MACHINERY INNOVATIONS**

Agitator has reclaimed manure lagoons around the world



BY BOB REID

The writer lives near Bright
farmhouse@cwisp.ca

Sebringville – With a dramatic entrance usually reserved for rock stars, the unveiling of a revolutionary piece of farming technology occurred here recently.

To the accompanying sound track of Space Odyssey, from concealment under a slowly rising tarpaulin, emerged blindingly bright head lights through the mist surrounding a self propelled liquid manure agitator.

Not just any self-propelled manure agitator but the 100th unit rolling off the assembly line at Nuhn Industries Limited



The majority of the lagoon crawlers have been sold in Wisconsin but some have been sold as far away as China and

Evidence of Industry Praise = Nuhn Declaration [EX2083], ¶¶34-52; News Publications [EX2061-EX2074]; Discovery Channel Segment [EX2080].

EX2070, 52.



GROUND 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Skepticism

76

Evidence of Skepticism and Surprise = Nuhn Declaration [EX2083], ¶¶53-63; Discovery Channel Segment [EX2080].

60. Mr. Koscamp—the dairy farmer whose manure lagoon was pumped by the Lagoon Crawler in the Discovery Channel segment during Extreme Machines week—also skeptically “need[ed] to be sold on this” because he “never thought it could be done” (see around 3m:40s and 4m:40s). See EX2080.

EX2083, ¶60.

Early on, one of the biggest challenges was that “a lot of the suppliers didn’t take us seriously,” Nuhn said. “It felt like this project quickly went to the back of their minds because they

EX2068 32.



GROUND 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Licensing

77

- Evidence of Licensing = Nuhn Declaration [EX2083], ¶¶64-67; Puck Email [EX2075].
- Prior Market Leader Puck Custom Enterprises sought to license Nuhn's Lagoon Crawler Patents

64. My Lagoon Crawler invention proved so successful that Puck—the prior market leader in agitation boats that Nuhn has since eclipsed with the Crawler—has sought a license to the Lagoon Crawler technology which includes the '708 Patent and the family of related patents.

EX2083, ¶64.

GROUND 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Copying

78

Evidence of Copying = Prairie Declaration [EX2099], ¶¶708-728; Nuhn Declaration [EX2083], ¶¶68-76; Bazooka Patent Apps. [EX2048-EX2050]; Stutsman Invoices [EX2076-EX2078].

Nuhn's Lagoon Crawler



EX2043, NUHN15000007242

Bazooka's Wolverine Agitation Boat



EX2031 at 17

EX2099, ¶720.



GROUNDS 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Copying

79

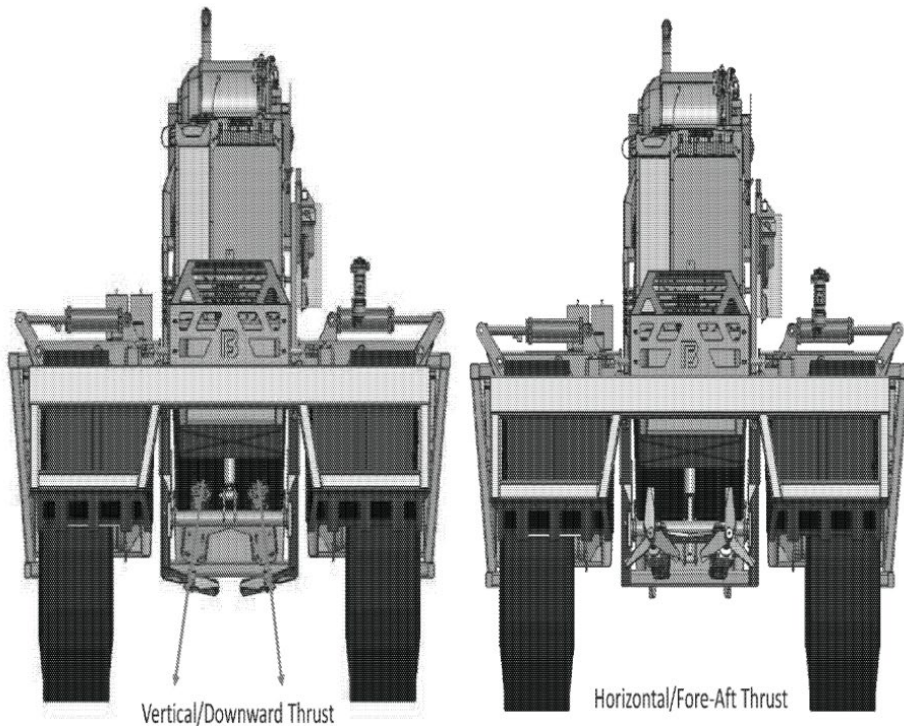


Figure 3A

Figure 3B

EX2048, 18.

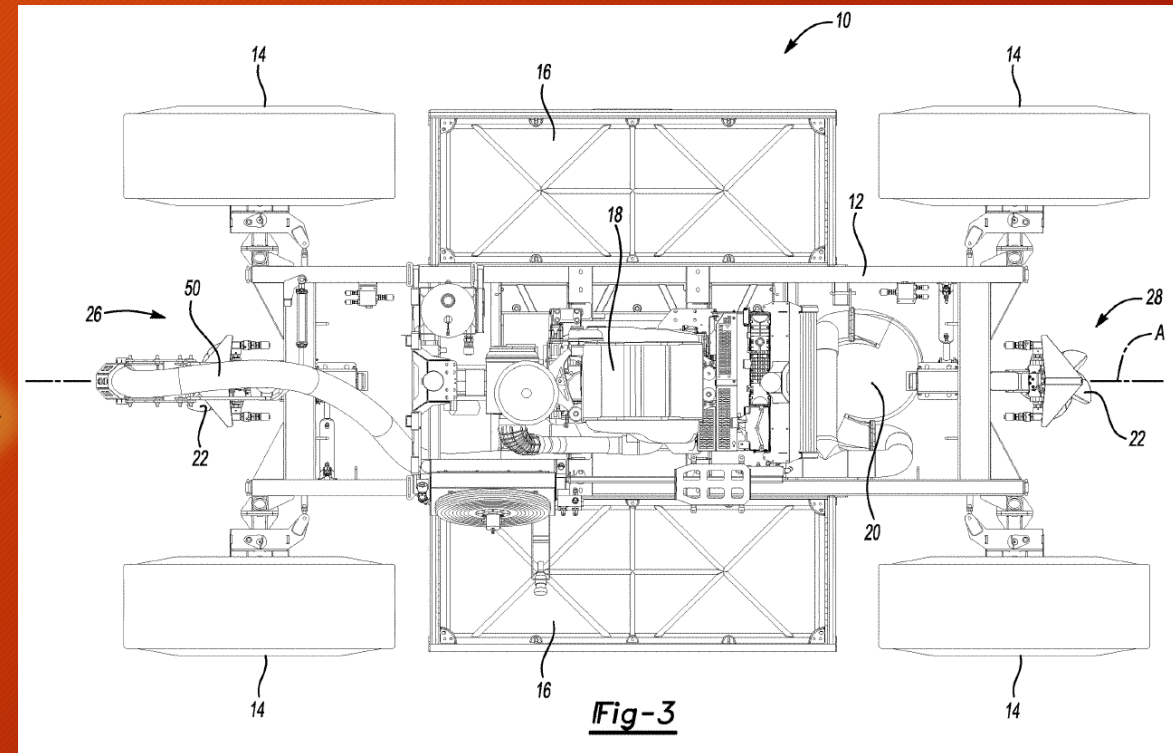


Fig-3

EX2050, 4.

GROUND 2-8 - Secondary Considerations of Non-Obviousness Support Patentability - Nexus

80

Evidence of Nexus = Prairie Declaration [EX2099], ¶¶519-699, 728; EX2035-EX2047.

728. In summary, it is my opinion that Nuhn's Lagoon Crawlers embody the features claimed in the '708 Patent and are coextensive with the claimed features, and that there are secondary considerations of non-obviousness that show that the claims of the '708 Patent are not obvious.

EX2099, ¶728.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

