

EXHIBIT

Blasters-1009

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BLASTERS, INC.

Petitioner

v.

WATERBLASTING, LLC, D/B/A WATERBLASTING TECHNOLOGIES

Patent Owner

Inter Partes Review Case No.: Unassigned

U.S. PATENT NO. 7,255,116

DECLARATION OF SCOTT F. BOOS

Blasters-1009
IPR of U.S. Pat. No. 7,255,116

TABLE OF CONTENTS

I.	INTRODUCTION.....	4
II.	MY BACKGROUND AND QUALIFICATIONS	4
III.	MATERIALS CONSIDERED IN FORMULATING MY OPINION ..	7
IV.	PERSON HAVING ORDINARY SKILL IN THE ART	8
V.	RELEVANT LEGAL STANDARDS.....	9
VI.	CLAIM CONSTRUCTION	9
VII.	THE ‘116 PATENT	15
VIII.	STATE OF THE ART BEFORE JULY 2, 2004 AND SUMMARY OF REFERENCES	19
	A. PCS Website.....	19
	B. Jones.....	21
	C. Breither	23
	D. Herhold	25
	E. Schrunk	26
	F. NLB Brochure.....	27
	G. Sloan	31
	H. Clemons	31
IX.	IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE.....	32
	A. Ground 1: Claims 1, 2, and 10 are obvious over Jones in view of Breither and in further view of NLB.....	33
	1. Combination of Jones, Breither, and NLB	33
	2. Claim 1	36
	3. Claim 2.....	67
	4. Claim 10.....	67
	B. Ground 2: Claims 3 and 4 are obvious over Jones in view of Breither and further in view of Herhold.....	69
	1. Claim 3	69

Inter Partes Review of U.S. Patent No. 7,255,116
Declaration of Scott F. Boos (Blasters-1009)

2. Claim 4	71
C. Ground 3: Claims 5 and 6 are obvious over combination of Jones, Breither, Herhold, and Schrunk.....	72
1. Claim 5	72
2. Claim 6	80
D. Grounds 4: Claims 1-4 are obvious based on Clemons in view of NLB	82
1. Overview of the combination of Clemons and NLB Brochure	82
2. Claim 1	85
3. Claim 2	102
4. Claim 3	104
5. Claim 4	106
6. Claim 10	106
E. Ground 5: Claims 5-6 are obvious based on Clemons in view of NLB and in further view of Schrunk.....	108
1. Claim 5	109
2. Claim 6	113
X. CONCLUSION	114

I, Scott F. Boos, hereby declare as follows:

I. INTRODUCTION

1. I have personal knowledge of the facts set forth in this Declaration. I am competent to testify as to all matters stated, and I am not under any legal disability that would in any way preclude me from testifying.

2. I understand that I am providing my opinion on behalf of Blasters, Inc. (“Petitioner”) as a technical expert for the above-captioned *inter partes* review (“IPR”). I understand that the petition for IPR involves U.S. Pat. No. 7,255,116 (“the ‘116 Patent”) (Blasters-1001), which has an earliest priority date of July 2, 2004.

3. In preparing this Declaration, I considered the viewpoint of a person having ordinary skill in the art (“POSA”) at the alleged time of invention, which I understand to be July 2, 2004. With that viewpoint, I have reviewed the ‘116 Patent and considered each of the documents cited herein in light of the general knowledge of POSA at the alleged time of invention. In formulating my opinion, I relied upon my personal knowledge, experience, and education in the relevant art.

4. In my opinion, and based on the foregoing, claims 1-6 and 10 are obvious in view of the relied upon prior art references.

II. MY BACKGROUND AND QUALIFICATIONS

5. I began my career in water blasting industry in 1982 working as a crew member during my summers. I continued to gain experience in this capacity until 1986. From 1986-1988 I became a leadman for Blasters, Inc., during which time I lead a crew of water blasting technicians to complete large projects, such as highway and airport resurfacing. My duties also included training crew members on the operation, safety, maintenance, and repair of water blasting equipment and accessories.

6. The year 1982 also marks the beginning of my work as an understudy to Frederick A. Boos. Fredrick Boos was a pioneer in the water blasting industry since 1975. He engineered many systems and was awarded several patents in the water blasting industry. As an understudy, I secured a greater understanding of the engineering and design of water blasting equipment. Fredrick Boos continues to participate actively in Blasters, Inc.

7. Between 1988 and 1994, while not necessarily having specific title in the company, I actively participated in the business development side of Blasters, Inc. By 1994 I was promoted to Vice-President of Blasters, Inc. As Vice-President, I gained extensive experience in the water blasting industry, and was recognized, nationally and internationally, for providing solutions to complex water blasting applications. I held this position until 1999, at which time I became the President of Blasters, Inc., which is a position I currently hold. As President, I created a certified

pre-owned water blaster division and was personally involved in the manufacturing of Blasters' Liquidator markings, stripe and rubber removal systems.

8. I have participated in numerous factory authorized technical training programs including ones held by industry leaders, such as Federal Signal Corp/Jetstream, Flow International, Gardner Denver Water Jetting Systems, and National Liquid Blasters (NLB) Corp. Moreover, I have received several awards, including the following:

- A. 2009 – Ready Jet, US Department of Commerce Export Achievement Award
- B. 2007 – Ready Jet, World of Concrete Export Achievement Award
- C. 2006 – Hydro demolition, American Shotcrete and Repair Outstanding Project Award
- D. 2006 – Hydro demolition, International Concrete Repair Institute Award of Project Excellence
- E. 1993 – Hydro demolition, Federal Highway and Florida Department of Transportation Job of the Year Award

9. I have also received several patents related to the water blasting industry, which include:

*Inter Partes Review of U.S. Patent No. 7,255,116
Declaration of Scott F. Boos (Blasters-1009)*

- A. U.S. Patent No. 8,510,905 entitled “Removal of hardened concrete from ready mixed drum interiors using upwardly directed high pressure water.”
- B. U.S. Patent No. 8,301,306 entitled “Control system for machine that cleans drums of ready mixed concrete trucks.”
- C. U.S. Patent No. 7,546,743 entitled “Removal of hardened concrete from ready mixed drum interiors using upwardly directed high pressure water.”
- D. U.S. Patent No. 7,556,319 entitled “Apparatus for resurfacing concrete.”
- E. U.S. Patent No. 7,610,924 entitled “Apparatus for coating and deposit removal inside large diameter tubes.”
- F. U.S. Patent No. 8,510,905 entitled “Vacuum debris collection box having sloped debris chute.”

**III. MATERIALS CONSIDERED IN FORMULATING MY
OPINION**

- 10. In the preparation of this declaration, I reviewed the following:
 - (a) The ‘116 Patent (Blasters-1001)
 - (b) The Jones reference (“Jones”) (Blasters-1002)
 - (c) The Breither reference (“Breither”) (Blasters-1003)

- (d) The Herhold reference (“Herhold”) (Blasters-1004)
- (e) The Schrunk reference (“Schrunk”) (Blasters-1005)
- (f) The NLB Brochure (“NLB”) (Blasters-1006)
- (g) The Sloan reference (“Sloan”) (Blasters-1007)
- (h) The Clemons reference (“Clemons”) (Blasters-1008)
- (i) thefreedictionary.com (Blasters-1010)
- (j) Meriam-Webster Dictionary Online (Blasters-1011)
- (k) Meriam-Webster Dictionary (Blasters-1012)
- (l) Dictionary.com (Blasters-1013)
- (m) The Oxford Dictionary (Blasters-1014)
- (n) Chambers Dictionary of Science and Technology (Blasters-1015)
- (o) Declaration of Christopher Butler (Blasters-1015)

IV. PERSON HAVING ORDINARY SKILL IN THE ART

11. I understand that a person of ordinary skill in the art (“POSA”) is a person presumed to be aware of pertinent art prior to July 2, 2004, has ordinary creativity, and thinks in accordance with conventional wisdom in the art. A POSA would have typically had 4-5 years of experience working with surface cleaning devices and systems and/or a degree in mechanical engineering or an equivalent

education. Moreover, a POSA would have had knowledge of known systems, devices, and techniques used in the field, such as those described in the '116 Patent and the prior art references.

V. RELEVANT LEGAL STANDARDS

12. I understand that an obviousness analysis includes comparing a claim to the prior art to determine whether the claim limitations are obvious in view of the prior art and the general knowledge of a POSA. I understand that the objective reach of the claim must be determined in deciding if the claim is obvious. Moreover, I understand that a system is obvious if it is simply an arrangement of known elements with said known elements performing as expected and the arrangement yielding nothing more than what a POSA would expect.

13. I further understand that obviousness can be established by combining or modifying the teaching of one or more prior art references to achieve the claimed invention. Furthermore, I understand that there must be a reasonable motivation to combine the teachings of said references and there must be a reasonable expectation of success of arriving at the claimed invention. I also understand that the motivation to combine can originate from a variety of sources, not just the prior art or the specific problem the patentee was trying to solve.

VI. CLAIM CONSTRUCTION

14. I understand that during an *inter partes* review the claims are to be interpreted in accordance with their broadest reasonable interpretation (BRI) in light of the specification as they would have been understood by a POSA. Apart from the following terms, I have interpreted the claim terms in accordance with their ordinary and plain meaning.

15. “hard surface” (Claims 1 and 4)

16. Under BRI a POSA would have understood the term “hard surface” to mean any surface having rigidity sufficient to support the weight of a vehicle carrying the blast head. The ‘116 Patent does not provide a specific definition for this term, but it is clear that “hard surface” is a broad category encompassing a wide variety of surfaces, on which the vehicle carrying the blast head can be driven. *See* *Blasters-1001* at 1:6-7 (“highways, runways, parking decks, and other hard surfaces”). Thus, under BRI, any surface on which the vehicle carrying the blast head can be driven qualifies as a “hard surface.”

17. “high pressure” (Claim 1)

18. Under BRI, a POSA would have understood the term “high pressure” to mean “of or relating to pressures higher than normal, especially higher than atmospheric pressure.” *See* *Blasters-1010*. Claim 1 uses the term “high pressure” in connection with four mechanical components: “high pressure pump,” “high pressure

liquid,” “high pressure hose,” and “high pressure nozzle.” The ‘116 Patent, while titled “Stripe Removal System,” doesn’t claim a system designed specifically for the removal of paint stripes. Rather, the claimed system is simply a cleaning system. Without providing any quantitative limits or ranges on the qualitative term “high” a POSA would understand that the claimed system is any cleaning system employing a pressure higher than atmospheric pressure.

19. “blast head” (Claims 1, and 3-5)

20. Under BRI, the term “blast head” should be construed to mean a mechanical component having one or more nozzles for ejecting a substance onto a surface. The specification of the ‘116 Patent provides a limited explanation as to what constitutes a “blast head” and is completely devoid of the term “mobile blast head.” The most informative clause in the ‘116 Patent states, “[t]he blast head 23 has at least one and up to sixteen high pressure nozzles 69 delivering high pressure fluid to the surface to be cleaned.” *See* *Blasters-1001* at 3:65-67. The remainder of the discussions in the ‘116 Patent relating to the blast head fail to provide any further insight into what constitutes a blast head. A POSA, when considering the specification as a whole, and in particular the statement “[t]he blast head 23 has at least one and up to sixteen high pressure nozzles 69 delivering high pressure fluid to the surface to be cleaned,” would have understood the term “blast head” to mean a

mechanical component having one or more nozzles for ejecting a substance onto a surface.

21. **“sump” (Claims 1-2)**

22. Within the context of the claimed cleaning system, the term “sump” should be construed in accordance with its plain and ordinary meaning: a reservoir serving as a receptacle for liquid and substances removed from a surface. *See* Blasters-1011.

23. **“connected to” (Claims 1-3 and 6)**

24. The term “connected to” should be construed in accordance with its plain and ordinary meaning: directly or indirectly joined or linked together. *See* Blasters-1012. As I understand it, the Board has previously determined that “[t]he accepted definition of the term ‘connected’ is restricted to neither a direct nor an indirect connection, and the term is therefore applicable to an indirect connection” *Pacific Surf Designs, Inc. v. Surf Waves, Ltd.*, 2017 WL 506465, at *4 (Patent Tr. & App. Bd., 2017) (citation and quotations omitted).

25. **“coatings” (Claim 1)**

26. Under BRI, A POSA would have understood the term “coatings” in accordance with its plain and ordinary meaning: “a layer of any substance spread over a surface.” *See* Blasters-1013 (emphasis added). The ‘116 Patent recites the term “coatings” throughout its claims, but does not expressly define this term. The

‘116 Patent lacks a definition for the term “coatings,” but it can be deduced from the Abstract that the term is not restrictive to paint. The ‘116 Patent explains that the system removes “paint and other coatings from hard surfaces” *Blasters-1001* at Abstract. While the plain and ordinary meaning of the term “coatings” encompasses paint, a POSA would have understood that the term “coatings” has a broader meaning encompassing substances that are more easily removed from a hard surface when compared to paint. Therefore, under BRI, the term “coatings” should be construed in accordance with its plain and ordinary meaning: a layer of any substance spread over a surface.

27. “high power vacuum pump” (Claims 1 and 2)

28. A dictionary definition of the term “high power” is “having greater than normal strength or capabilities.” *See* *Blasters-1014*. Regarding the power and capabilities of the vacuum pump, the ‘116 Patent states that an object of the invention is to provide “a vacuum recovery system for the water and debris being generated.” *See id.* at 2:55-56. The ‘116 Patent discloses a specific embodiment having a vacuum pump with “an intake capable of approximately 1,100 CFM (cubic feet per minute).” *See id.* at 3:47-49. This excerpt, however, only explains that a pump with an intake of approximately 1,100 CFM qualifies as a high power vacuum pump. The ‘116 Patent lacks a lower quantitative boundary for what intake values are required for a vacuum pump to qualify as a high power, and further fails to provide any insight into

why an intake of approximately 1,100 CFM is required to achieve the stated objective of recovering the water and debris created during the operation of the cleaning system. Instead, the '116 Patent clarifies that the object of the invention is to provide "a vacuum recovery system for the water and debris being generated." *See id.* at 2:55-56. Claims of the '116 Patent do not impose any numerical ranges or other quantitative limitations on the qualitative term "high power." Thus, the term "high power vacuum pump" should be construed as a vacuum pump capable of removing liquid and substances from a surface and conveying them to the vacuum tank.

29. **"mobile frame" (Claim 1)**

30. The term "mobile frame" has a first meaning as used in the claims, and also second, completely distinct meaning as used in the specification. In the specification, "[t]he mobile frame is a self-propelled tractor." *See id.* at 2:28. In contrast, the claims state, "said mobile frame form[s] an integral part of a truck." *See id.* at 6:51. These conflicting definitions appear to be a drafting error because "the mobile frame" cannot be both the self-propelled tractor and, also, an integral part of the truck.

31. Since the objective reach of the claims governs, a POSA would have understood that the term should be interpreted in accordance with the claims. Based on the use of the term in the claim, "mobile frame" should be construed as a chassis.

A chassis is “the base frame of a motor vehicle or other wheeled conveyance.” *See* Blasters-1014. Accordingly, a POSA would have understood the term “mobile frame” to mean the base frame of a motor vehicle or other wheeled conveyance.

32. “articulating link” (Claims 1 and 10)

33. Under BRI, a POSA would have understood that the term “articulating link” in accordance with its plain and ordinary meaning: “a connecting structure that connects two parts in such a way as to permit relative movement.” The term “articulation” means “the connection of two parts in such a way (usually by a pin joint) as to permit relative movement,” *see* Blasters-1011, and the term “link” is defined as “a connecting structure.” *See* Blasters-1012. Thus, under BRI, the term “articulating link” should be construed as “a connecting structure that connects two parts in such a way as to permit relative movement.”

34. “controlled movement” (Claims 10)

35. The term “controlled movement” should be construed as movement in a predetermined path. This term is only used in the claims and thus would have been understood in accordance with its plain and ordinary meaning.

VII. THE ‘116 PATENT

36. The ‘116 Patent discloses and claims “a cleaning system for removing coatings from a hard surface by high pressure liquid.” *See, e.g.,* Blasters-1001 at

2:23-24. The disclosed cleaning system is adapted to discharge pressurized water from nozzles in a “blast head” and then recover the discharged water and resulting debris via a vacuum recovery system. *See id.* at 2:24-28, 2:50-56. This type of cleaning system was well known in the art prior to the earliest priority date of the ‘116 Patent. In fact, I am personally aware of a device coined the StripeJet™, which was commercially available through the NLB Corporation and in use prior to July 2, 2004. In addition, my company, Blasters, Inc., also sold a prior art device that was commercially available prior to earliest filing date of the ‘116 Patent.

37. The ‘116 Patent does admit to the fact that these types of cleaning systems were known in the art prior and identified the StripeJet™ and my company’s system as two of those prior art cleaning systems. Specifically, the ‘116 Patent explains,

NLB Corporation markets a high pressure water jet system for removing paint from pavement under the name “StarJet”. The water jet system includes a blast head frame mounted on an attachment to the front bumper of a prime-mover truck. Casters support the frame for movement over the pavement and the path of the blast head is controlled by the driver steering the truck. Because of the position of the driver and the cab body of the prime-mover, it is difficult to see the blast head's position with regard to the stripes on the pavement.

*NLB Corporation also has another system marketed under the mark “**StripeJet**”, that is a self propelled tractor with a blast head on the front of the tractor. The blast head has a shroud and high pressure inlet with a vacuum recovery.*

*Another stripe removal system is marketed by the **Blasters Corporation** which is mounted on a truck similar to the “StarJet” device. Another model appears to be a self-powered four wheeled tractor, similar to a grass mower, which supports a driver and is connected to the prime-mover by high pressure lines for delivery of high pressure water to a blast head. The blast head is on the front of the tractor.*

See id. at 1:52-2:19 (emphasis added). These identified devices, however, were not considered by the U.S. Patent Office (USPTO) during the prosecution of the ‘116 Patent. *See id.* at pg. 1.

38. The ‘116 Patent alleged that, while water blasting and recovery systems were known in the art, “[t]he problem with the prior art is the inability to place an operator close to the material removal site by use of a device that has over-all dimensions that allow for easy transfer sideways on a truck or trailer having a width less than 8’6”.” *See id.* at 2:15-18. I understand this admission to mean that the alleged novelty of the disclosed system is not the use of a secondary vehicle, such

as a tractor, but rather that the secondary vehicle is sized to locate an operator in close proximity with the blast head and to permit the tractor to be stowed sideways on a truck or trailer for transportation. The alleged novelty, however, is not in fact novel as evidenced by, *e.g.*, the comparison image of the StripeJet™ and the Fig. 2 of the '116 Patent found in paragraph 53 below.

39. Independent claim 1 recites nothing more than a series of common, well-known, and obvious components of a cleaning system, such as a water tank, water hose, blast head, vacuum recovery system, vacuum hose, and vacuum chamber, which the patent admits to be conventional, known components in the prior art. Independent claim 1 further requires a truck for transporting an arbitrary subset of said components and a self-propelled tractor for manipulating a blast head secured thereto. Again, these limitations were admittedly well-known techniques for transporting and operating cleaning systems. Only dependent claim 5 even remotely addresses the size of the tractor. Still, claim 5 fails to quantitatively limit the tractor's length.

40. It is my opinion that all the claim limitations in the '116 Patent were known in the art prior to the filing date of the '116 Patent.

VIII. STATE OF THE ART BEFORE JULY 2, 2004 AND SUMMARY OF REFERENCES

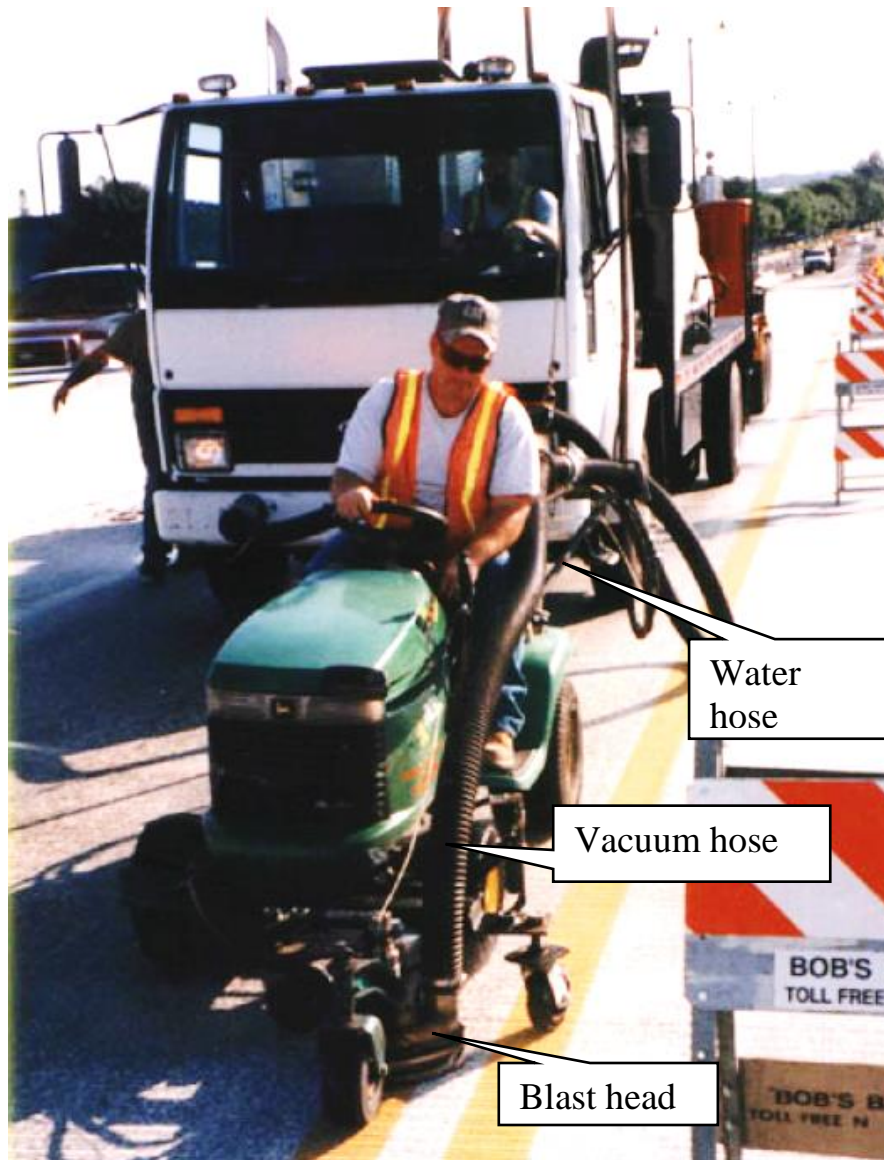
41. In my opinion, the references asserted against the ‘116 Patent and discussed herein clearly show that the limitations claimed in the ‘116 Patent were well known in the prior art. To the extent that a particular feature is not explicitly described in one of the asserted references, it is my opinion that such a feature would have been obvious to a POSA.

A. *PCS Website*

42. P.C.S. Inc. was started in 1988 by James P. Crocker (President & CEO of P.C.S. Inc.). The same James P. Crocker was the named applicant for the ‘116 Patent and is the current President of Waterblasting, LLC, d/b/a Waterblasting Technologies—the Patent Owner. *See* Blasters-1001.

43. As I understand it, the archived PCS website is not a relied upon prior art reference in any of the enumerated ground simply because the components on the truck following the tractor are not clearly identified. It is my opinion, however, that the website clearly evidences that the cleaning system in the ‘116 Patent was in use prior to 2003. *See* Blasters-1016 at pg. 16-20.

44. The disclosed cleaning system, as depicted below, included a tractor with a blast head and a truck following the tractor, which undoubtedly includes the various common components of the cleaning system.



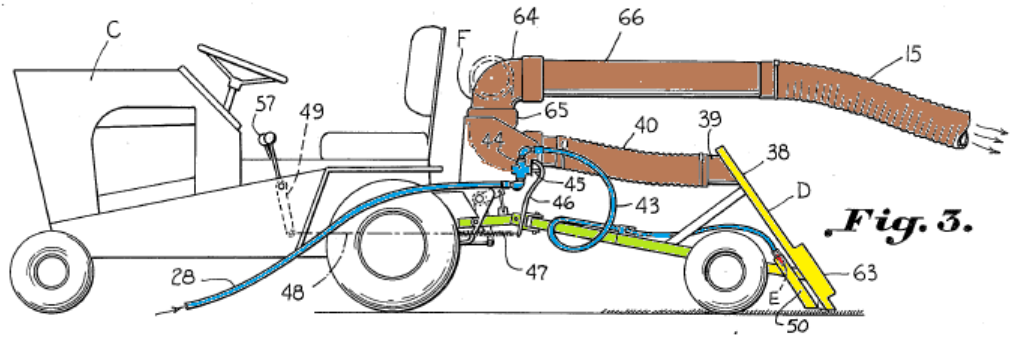
Blasters-1016 at pg. 16.

45. As shown in the reproduced image from Blasters-1016, the disclosed cleaning system included a self-propelled mower-type tractor having a blast head with a typical high pressure hose and a typical vacuum hose attached thereto. Both the vacuum hose and the water hose extend to the truck trailing the tractor and in my

opinion, are undoubtedly secured to the vacuum tank and the water pump, respectively. The system is clearly in use and capable of removing paint stripes as evidenced by the missing paint stripe behind the tractor. Thus, the system includes a nozzle discharging pressurized liquid capable of removing paint stripes. The image further evidences that the debris is being recovered during the operation of the tractor because the road surface behind the tractor appears free of liquid and debris. Therefore, the vacuum hose is unequivocally coupled to a vacuum tank and a high power vacuum pump.

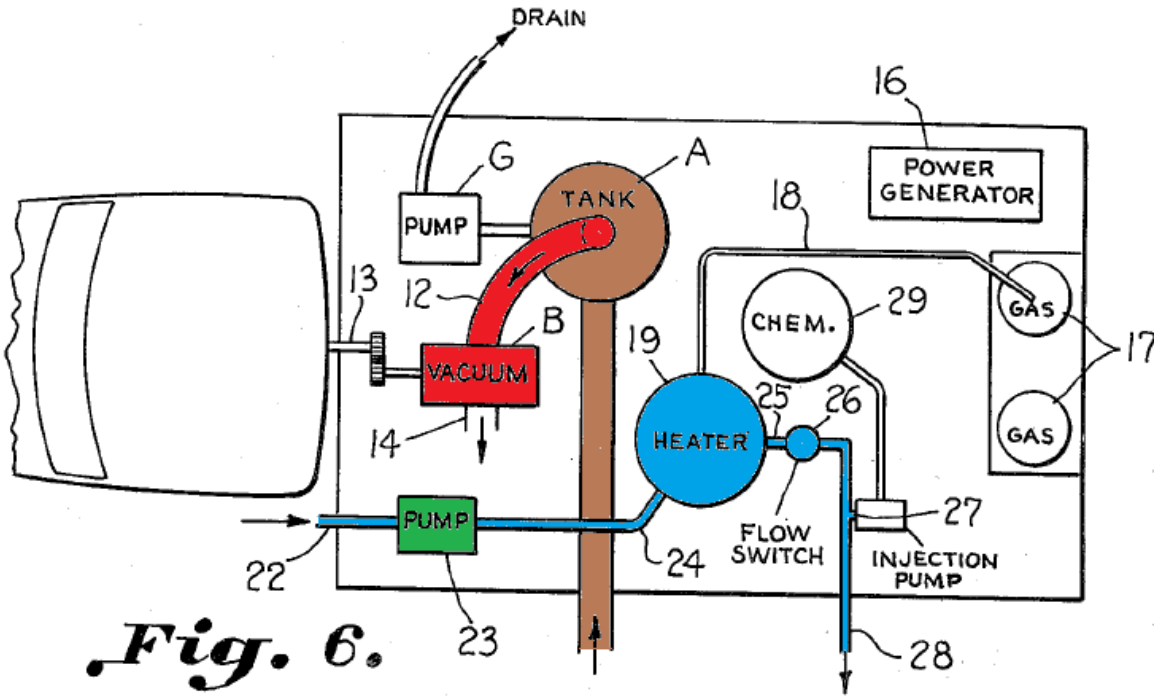
B. Jones

46. Jones discloses a water jet cleaning system employing a self-propelled utility vehicle (*i.e.*, a tractor) and a service truck. *Blasters-1002* at Abstract. As depicted below in reproduced FIG. 3, the motorized utility vehicle includes a blast head (highlighted in yellow) attached thereto via an articulating link (highlighted in green). *Id.* at 3:62 – 4:18, FIGS. 3-5. The blast head has a plurality of nozzles for spraying the surface being cleaned with a pressurized liquid. *See id.* at Abstract. The cleaning head also has a suction nozzle for collecting debris and spent liquid. *See id.*



Blasters-1002 at FIGS. 3

47. As depicted below in reproduced FIG. 6, the service truck disclosed in Jones carries a vacuum pump (highlighted in red) connected to a vacuum tank (highlighted in brown) and a pressure booster pump (highlighted in green). The vacuum nozzle in the blast head is connected to the vacuum tank via a waste vacuum hose, which extends from the service truck to the tractor. *Id.* at 2:41-43. The nozzle within the blast head is connected to the pressure booster pump via a water hose that extends between the service truck and the tractor. *Id.* at 2:65-68.



Blasters-1002 at FIG. 6 (annotated)

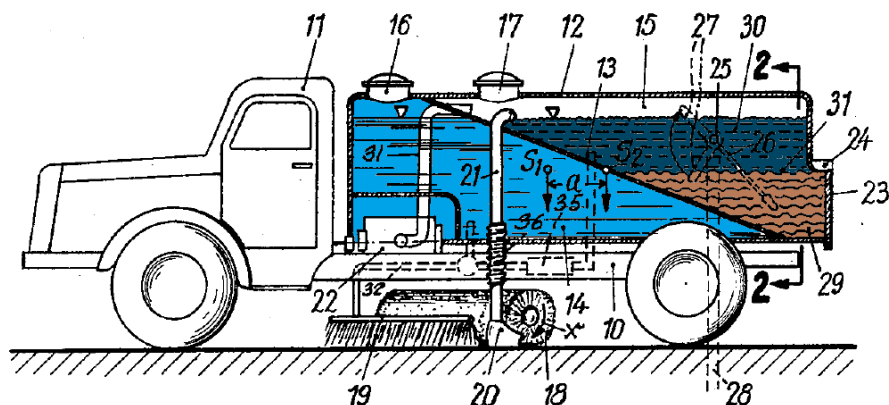
48. The water hose supplies pressurized liquid to the nozzle, from which said liquid is ejected onto the surface being cleaned. The resulting debris and spent liquid are recovered from the surface via the vacuum nozzle.

C. Breither

49. Breither discloses a cleaning system for removing debris from a surface using a water jet to dislodge debris and a vacuum pump to collect the debris and liquid. The cleaning system disclosed in Breither includes a truck carrying a liquid reservoir and a sump, both of which are mounted on a chassis behind the cab portion

of the truck. Blasters-1003 at 2:24-35. Breither further discloses that the liquid reservoir and sump are both structurally and fluidly coupled. With respect to the structural connection, Breither explains that “[d]ue to the overlapping arrangement of the two containers 14 and 15 and their separation by the diagonally inclined wall 13, the center of gravity will shift only a relatively short distance during one complete cycle of operation.” *Id.* at 3:35-39. With respect to advantages provided by the fluid connection, Breither explains: “[i]nstead of merely draining and discarding the soiled water from container 15 after the same has become somewhat purified by the settling of the solid mud particles toward the bottom of the container, this water may also be utilized again for washing the road.” *Id.* at 3:67-71. The structural arrangement of the sump (highlighted by dark blue and brown colors) and the liquid reservoir (highlighted by light blue) are illustrated below in reproduced FIG. 1 of Breither.

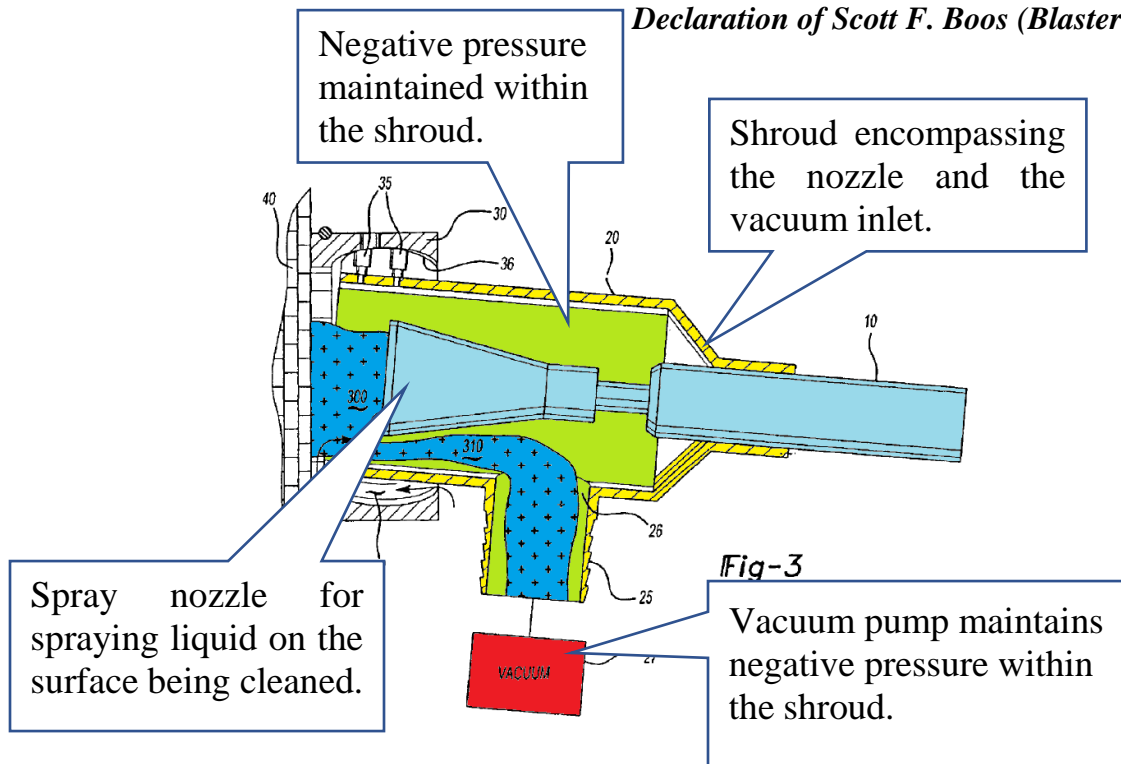
Fig.1



Blaster-1003 at FIG. 1 (annotated)

D. Herhold

50. Herhold discloses a blast head having a spray nozzle and a suction inlet. See Blasters-1004 at Abstract. The “shroud assembly has a stationary tubular sleeve spaced generally circumferentially about the outlet nozzle.” *Id.* Herhold further discloses that “the stationary tubular sleeve is provided with a laterally positioned outlet for attachment to a vacuum source to suction expelled fluid carrying loosened debris from the treated surface.” *Id.* FIG. 3 of Herhold illustrates the shroud surrounding the nozzle and having a vacuum source for maintain a negative pressure within the shroud:

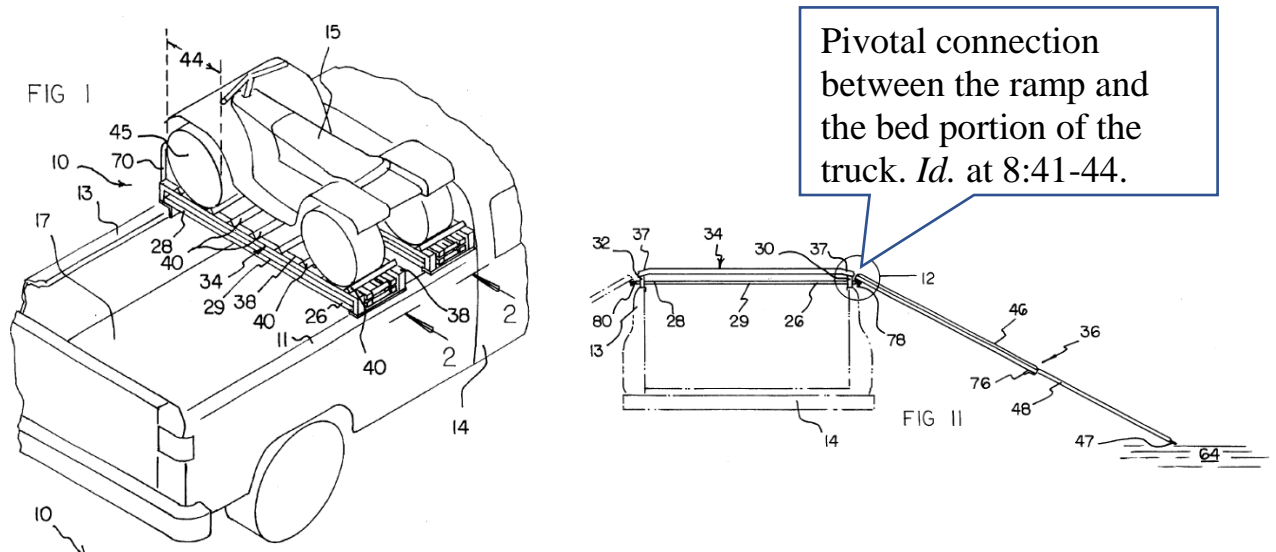


Blasters-1004 at FIG. 3 (annotated)

E. Schrunk

51. Schrunk discloses a vehicle carrying apparatus for storing a compact vehicle 15 transversely on a bed portion of a truck. Blasters-1005 at Abstract. Schrunk describes advantages of transporting a motorized utility vehicle by docking it transversely on a truck bed. Specifically, Schrunk explains that when the utility vehicle is docked transversely, it can be loaded and unloaded onto the truck bed by moving exclusively in the forward direction, thereby obviating the challenges associated with unloading the utility vehicle in reverse. *See id.* at 1:50-60, 4:32-25. Schrunk also discloses the compact vehicle having “a size” allowing it to be transversely loaded and stowed on the bed portion of the truck. *Id.* at FIG. 1.

52. Schrunk further discloses a retractable ramp pivotally connected to the bed portion of the truck. *Id.* at 7:54-56. To transition into the loading configuration, the ramp pivots downward and extends until it contacts the ground. *Id.* 7:56-62. The utility vehicle can then be rolled up the ramp and transversely docked on the bed portion of the truck. *Id.* 7:62-65. The transversely docked utility vehicle is depicted in FIG. 1, and the ramp is depicted in FIG. 11, both of which are reproduced and annotated below:

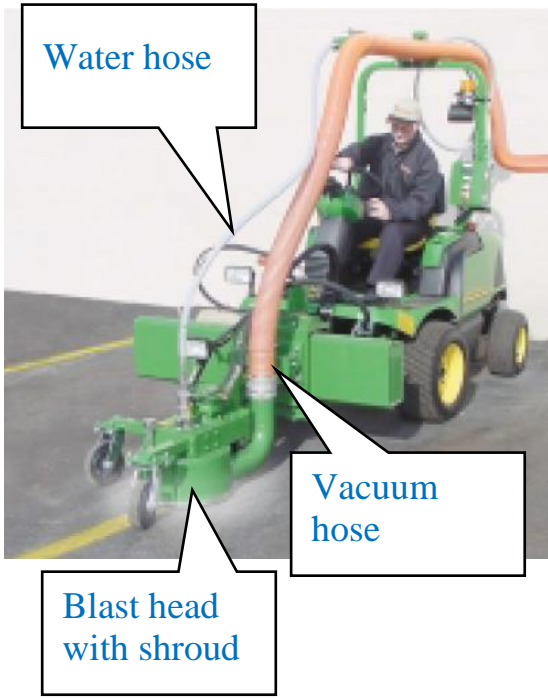
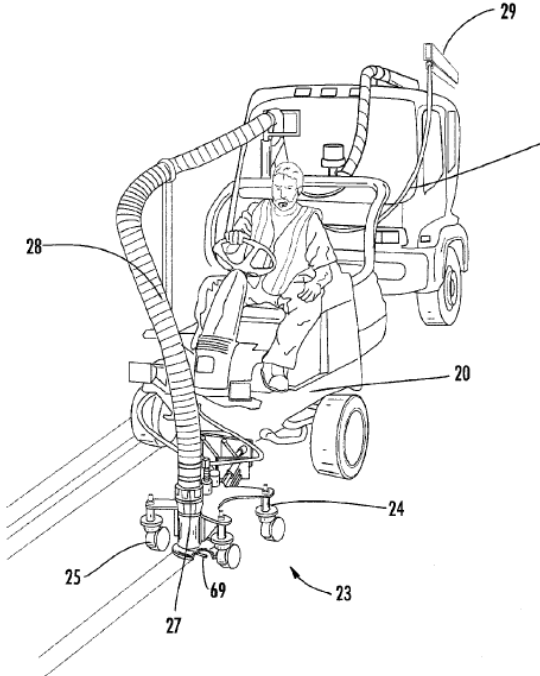


Blasters-1005 at FIG. 1, 6 (annotated)

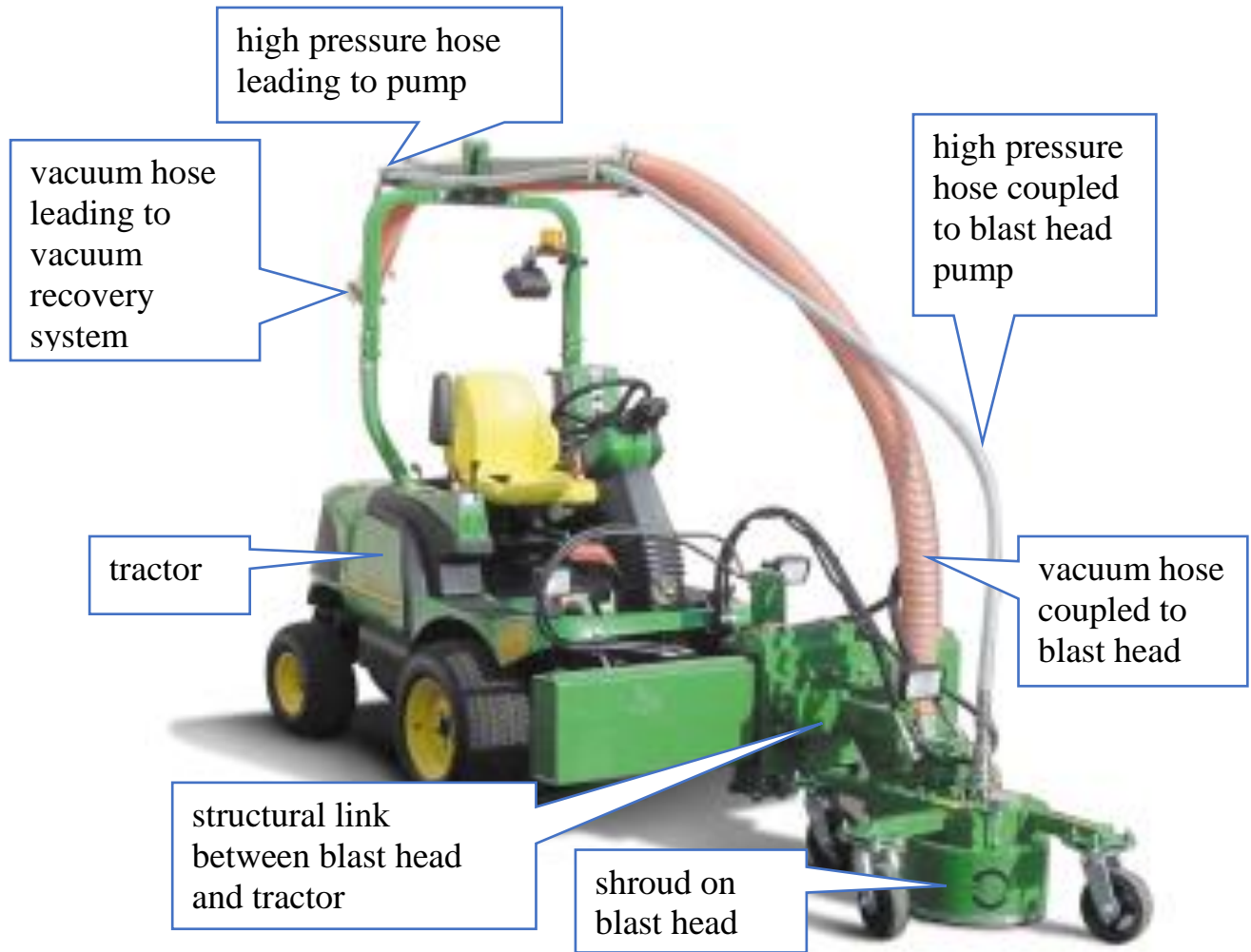
F. NLB Brochure

53. NLB was published on the Internet at least as early as March 27, 2004 and disclosed, *inter alia*, two cleaning systems—the StripeJet™ and StarJet™—which were commercially available through NLB Corporation. *See* Blasters-1006 at

pg. 7; Blasters-1016 at pg. 7-15. Both cleaning systems were configured to remove pavement markings via water blasting and each optionally included a vacuum recovery system for retrieving the discharged water and resulting debris. *See* Blasters-1006 at pg. 1-5. The StripeJet™ system delivered pressurized water (up to 40,000 psi) through a nozzle assembly (*i.e.*, blast head) mounted to a compact utility vehicle (*i.e.*, a tractor). *Id.* The tractor was specifically identified as being “ideal” for use in “areas with limited access (e.g., parking lots, garages, intersections).” *Id.* at pg. 5. Furthermore, the system bears a striking resemblance to Fig. 2 of the ‘116 Patent.

NLB StripeJet™ (Blasters-1006 at pg. 5) (annotated)	Fig. 2 of the 116 Patent (Blasters-1001)
 <p>Water hose</p> <p>Vacuum hose</p> <p>Blast head with shroud</p>	 <p>29</p> <p>28</p> <p>20</p> <p>24</p> <p>25</p> <p>27</p> <p>69</p> <p>23</p>

54. The StripeJet™ is a “complete system[] with a patented rotating nozzle assembly, an ULTRACLEAN 40® pump unit, water tank, and optional vacuum recovery to contain water and debris. Simple controls make it easy for the driver to work alone.” *Id.* at pg. 2. An additional figure is provided below to further highlight the components of the StripeJet™.



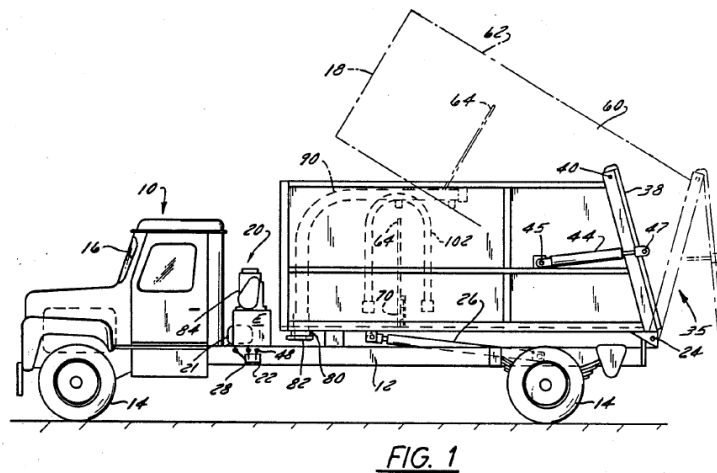
(Blasters-1006 at pg. 4) (annotated)

55. While both images of the StripeJet™ do not include a depiction of the vacuum hose and the water hose extending to a truck, it is my opinion that a POSA would undoubtedly understand that vacuum hose and the water hose are secured to a vacuum tank and a water pump, respectively. This fact is obvious when considering the FIG. on page 5 showing the system clearly in the process of removing paint stripes as evidenced by the missing paint stripe behind the tractor. The image further

depicts the debris being recovered during the operation of the tractor because the road surface behind the tractor appears free of liquid and debris. Finally, the hoses must be secured to their respective pumps to create a workable system. Therefore, the vacuum hose is unequivocally coupled to a vacuum tank and a high power vacuum pump.

G. Sloan

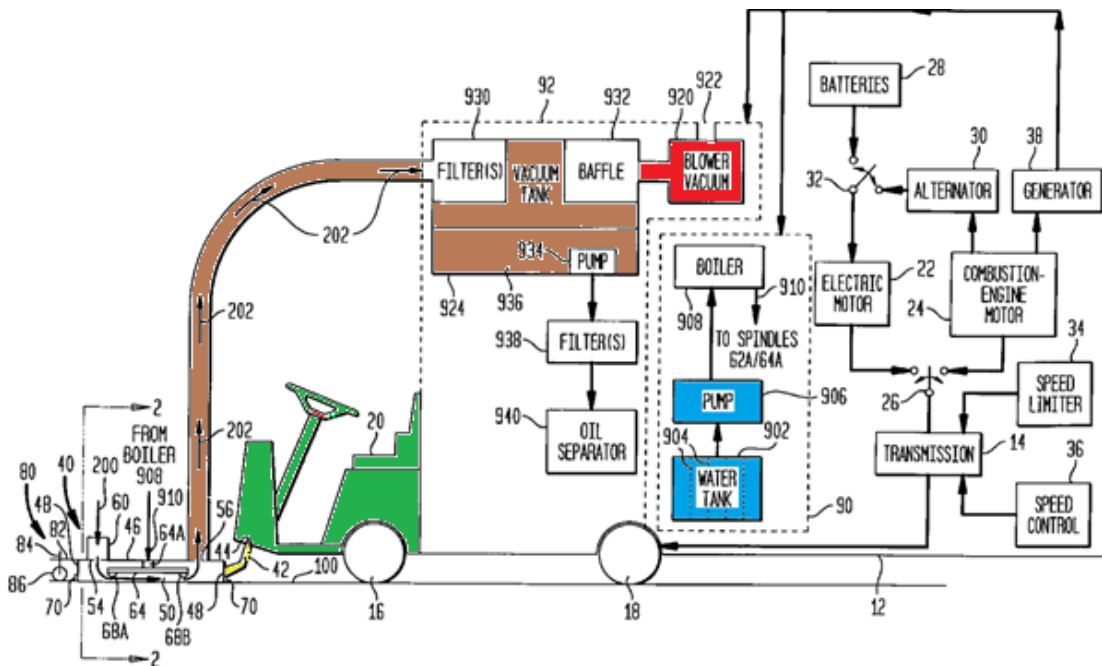
56. Sloan discloses a truck having a sump mounted onto a “tiltable dump body.” *Blasters-1007* at Abstract; FIG. 1. The ability to tilt the sump aids in discharging material from the sump.



Blasters-1007 at FIG. 1

H. Clemons

57. Clemons discloses a cleaning system for removing debris from a hard surface, such as a runway or street. *Blasters-1008* at Abstract, 1:54-59. The system includes a cleaning head mounted to the front of a self-propelled vehicle (partially highlighted in green) via a pivoting arm (highlighted in yellow) and a vacuum reclamation system to recover the resulting liquid and debris. *Id.* at Abstract, 3:36-38. Both the liquid delivery system (highlighted in blue) and the vacuum recovery system (highlighted in brown and red) are mounted on the vehicle and are fluidly coupled to the cleaning head. *Id.* at 4:46-48.



Blasters-1008 at FIG. 1 (annotated)

IX. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

A. Ground 1: Claims 1, 2, and 10 are obvious over Jones in view of Breither and in further view of NLB

1. Combination of Jones, Breither, and NLB

58. There is a significant overlap between the cleaning systems disclosed in Jones, Breither, and the NLB Brochure. They all disclose self-propelled cleaning systems for removing foreign substances from a surface. In all three, the surface is cleaned by spraying a liquid thereon and, then, using a vacuum to remove spent liquid and foreign matter from the ground and convey them to a vacuum tank. Thus, these three references are analogous.

59. Jones does not expressly disclose a liquid reservoir, but does identify an object of the invention as providing a portable system. *Blasters-1002* at 1:23-25. Jones states that “water is supplied ... from *any* suitable source.” *Id.* at 2:57-58. Therefore, a POSA would have been motivated to improve the portability of the Jones system by including a water tank.

60. Breither discloses that the water source used by its cleaning system is supplied from a liquid reservoir mounted on the truck. In my opinion, it would have been obvious to a POSA to modify the cleaning system of Jones to include the water reservoir disclosed in Breither. A POSA would have been motivated to do so because placing the water supply directly onto the truck in Jones would have resulted in a

cleaning system that is independent of any external water supply, thereby enabling the cleaning system to be used in a wider variety of settings including those where a municipal water connection is not readily available.

61. In introducing the liquid reservoir to the cleaning system disclosed in Jones, POSA would adhere to the teachings of Breither directing the POSA to dispose the liquid reservoir and the sump within a single partitioned tank to achieve multiple advantages recited in Breither. One recited advantage in Breither of a tank having a diagonal partition separating the water reservoir and the sump is that the truck would better maintain a consistent center of gravity. *Blasters-1003* at 2:1-7. Breither discloses a second important objective, which is achieved by fluidly coupling the sump to the water reservoir: spent water collected from the surface being cleaned can be reused thereby extending the duration of continuous operation of the cleaning system and reducing the amount of fresh water used by the system. *Id.* at 1:54-62.

62. Thus, after reading the disclosure of Breither, a POSA would have been motivated to modify Jones by mounting the partitioned tank containing the liquid reservoir and the sump onto the service truck. A POSA would further be motivated to fluidly couple the sump and the liquid reservoir per the disclosure of Breither. The liquid reservoir would serve as “any suitable [liquid] source” disclosed in Jones and would supply water to the pressure booster pump. The vacuum tank in Jones would

be replaced by the sump and would connect to Jones' vacuum pump to maintain negative pressure within the sump. In addition, a vacuum hose would connect the sump to the suction nozzle within the cleaning head. Such modifications would have been straightforward, not requiring undue experimentation, and would produce predictable results.

63. Although excluded from the claims, the '116 Patent discloses a cleaning system that, in some embodiments, can be used to remove paint from a pavement using liquid pressurized between 25,000 and 40,000 psi. Neither Jones nor Breither explicitly states that the cleaning system disclosed therein discharges liquid at a pressurized between 25,000 and 40,000 psi. The NLB reference however, does disclose a cleaning system having such capability. Considering the NLB Brochure, it would have been obvious to replace the pump, hoses, and nozzles of Jones with the "high pressure" pump, hoses, and nozzles disclosed in the NLB Brochure to create a system that is more powerful and thus more efficient and versatile. The system could discharge liquid at 40,000 psi, but could also be easily adjusted to produce pressurized liquid below that amount to conform to the needs of a particular job. In any event, the pump, hoses, and nozzles are interchangeable, and it would have been a simple substitution of known elements. This obvious modification would have produced a cleaning system that could easily remove paint stripes from pavement and would have been capable of discharging liquid pressurized to 40,000

psi. Such modifications also have been straightforward, not requiring undue experimentation, and would produce predictable results.

2. Claim 1

- a. “A cleaning system for removing coatings from a hard surface by high pressure liquid ...”

64. Jones discloses a cleaning system that includes “a pressurized cleaning medium, . . . said cleaning head for *spraying said cleaning medium on said turf* ahead of said suction nozzle as said head is passed across the turf, and means communicating with a base portion of said tank for conveying away the used cleaning medium and foreign matter removed from the turf.” *Blasters-1002* at 6:8-16 (emphasis added). Thus, it is my opinion that Jones discloses a cleaning system for removing coatings from a hard surface by high pressure liquid.

65. Although the ‘116 patent does not explicitly define the term “coatings,” the ‘116 Patent makes it clear that the term “coatings” identifies a broad category encompassing various substances including paint. *See Blasters-1001* at Abstract (“removing paint and other coatings”) (emphasis added). Similarly, Jones provides a broad definition for the terms “foreign matter” which encompasses a plurality of exemplary substances, such as “oily fallout, soot, broken glass, and other hazardous materials.” *Blasters-1002* at 1:9-11. Accordingly, it is my opinion that Jones discloses a cleaning system for removing coatings.

66. Next, preamble of claim 1 of the '116 Patent recites a "hard surface."

Although the '116 Patent does not provide a definition for this term, the specification of the '116 Patent indicates the "hard surface" is a broad term encompassing a wide variety of surfaces on which the vehicle carrying the blast head can be driven. *See* *Blasters-1001* at 1:6-7 ("highways, runways, parking decks, and other hard surfaces") (emphasis added). Jones discloses a cleaning system for an artificial turf. A key aspect of the cleaning system disclosed in Jones is that a motorized utility vehicle must be driven on the artificial turf. *Blasters-1002* at 1:63-64. Thus, the artificial turf can support the weight of the motorized utility vehicle and, therefore, it is my opinion that Jones discloses a cleaning system for removing coatings from a hard surface.

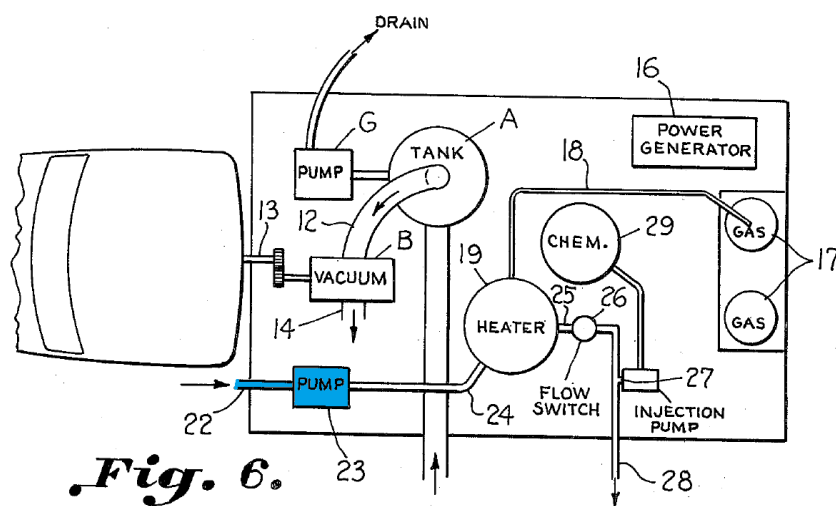
67. Finally, the preamble of claim 1 of the '116 Patent recites the term "high pressure liquid." Claim 1 does not impose any quantitative limitations on the qualitative term "high." Under the BRI standard, a POSA would have understood a liquid at a pressure above the ambient to qualify as a "high pressure liquid" recited in claim 1. Jones discloses a "pressurized cleaning medium" and a "pressure booster pump [] which build the pressure of the water to approximately 200 pounds per square inch." *Blasters-1002* at 2:60-62. Normal atmospheric pressure is approximately 14.7 psi, and, therefore, the pressurized cleaning medium disclosed in Jones is pressurized to a level that is over thirteen times greater than the

atmospheric pressure. Thus, the “pressurized cleaning medium” disclosed in Jones is a “high pressure liquid” as recited in the preamble of claim 1 of the ‘116 Patent.

68. Accordingly, it is my opinion that Jones teaches all limitations recited in the preamble of claim 1 of the '116 Patent.

b. “a liquid reservoir connected to a high pressure pump”

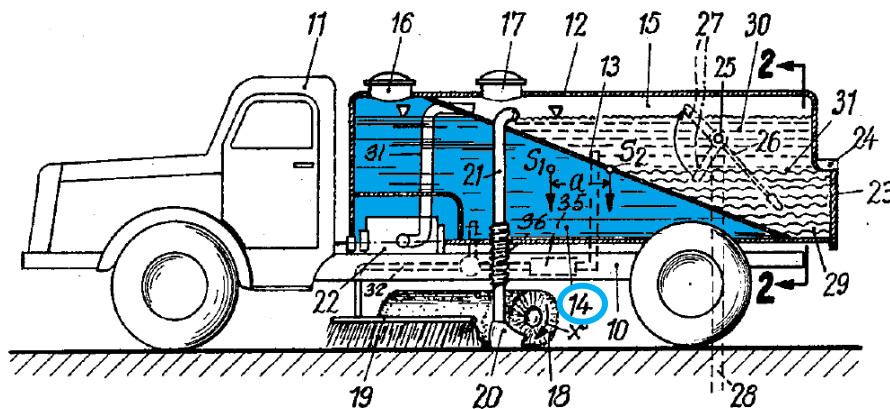
69. It is my opinion that the limitation “a liquid reservoir connected to a high pressure pump” would have been obvious to a POSA in view of Jones and Breither. Jones discloses that “water is supplied to line 22 shown in FIG. 6 from *any suitable source*” and is “fed through an electrically operated pressure booster pump 23 which builds the pressure of the water to approximately 200 pounds per square inch.” *Id.* at 2:57-62 (emphasis added). FIG. 6 is reproduced below with the connection to the water supply and the pressure booster pump connected thereto emphasized with blue color:



Blasters-1002 at FIG. 6 (annotated)

70. As established in paragraph 59, *supra*, although Jones does not expressly disclose a liquid reservoir, Breither discloses a tank 12 having a fresh-water container 14. Blasters-1003 at 2:21-30. In my opinion, it would have been obvious for a POSA to modify the cleaning system disclosed in Jones by mounting Breither's tank 12 having a fresh-water container 14 onto the flat bed portion of the Jones's service truck. Water supply line 22 of Jones would simply connect to the outlet of the fresh-water container 14 of Breither. FIG. 1 of Breither depicts the fresh-water container 14, which is emphasized with blue color:

Fig. 1



Blaster-1003 at FIG. 1 (annotated)

71. As established in Paragraphs 59-63, *supra*, a POSA would have been motivated to modify the cleaning system of Jones by mounting the tank having a fresh-water container onto the service truck to achieve a self-contained cleaning

system that is not dependent on an external water source. This modification would have been straightforward, would not require undue experimentation, and would produce a predictable result with a high expectation of success.

72. Jones further states that water can be supplied from “any suitable source” to the pressure booster pump. The fresh-water container disclosed in Breither, once attached to the truck in Jones, would thus have been connected to the pressure booster pump to supply liquid to said pump. Accordingly, Jones in view of Breither discloses a liquid reservoir connected to a high-pressure pump.

73. With respect to the term “high pressure pump,” it is my opinion that the pressure booster pump in Jones equates to a high pressure pump as claimed in claim 1. Under the BRI standard, a POSA would understand that any pump that pressurizes the cleaning liquid to a pressure that is above ambient atmospheric pressure would satisfy this limitation. Thus, the pressure booster pump disclosed in Jones, which “builds the pressure of the water to approximately 200 pounds per square inch,” satisfies the “high pressure pump” limitation of claim 1 of the ‘116 Patent.

74. Even if the term “high pressure pump” is construed to mean a pressure between 25,000 and 40,000 psi, this limitation would still have been obvious in the mind of a POSA. As previously explained, NLB discloses a cleaning system adapted to discharge fluid at 40,000 psi. There is nothing uniquely difficult in achieving such

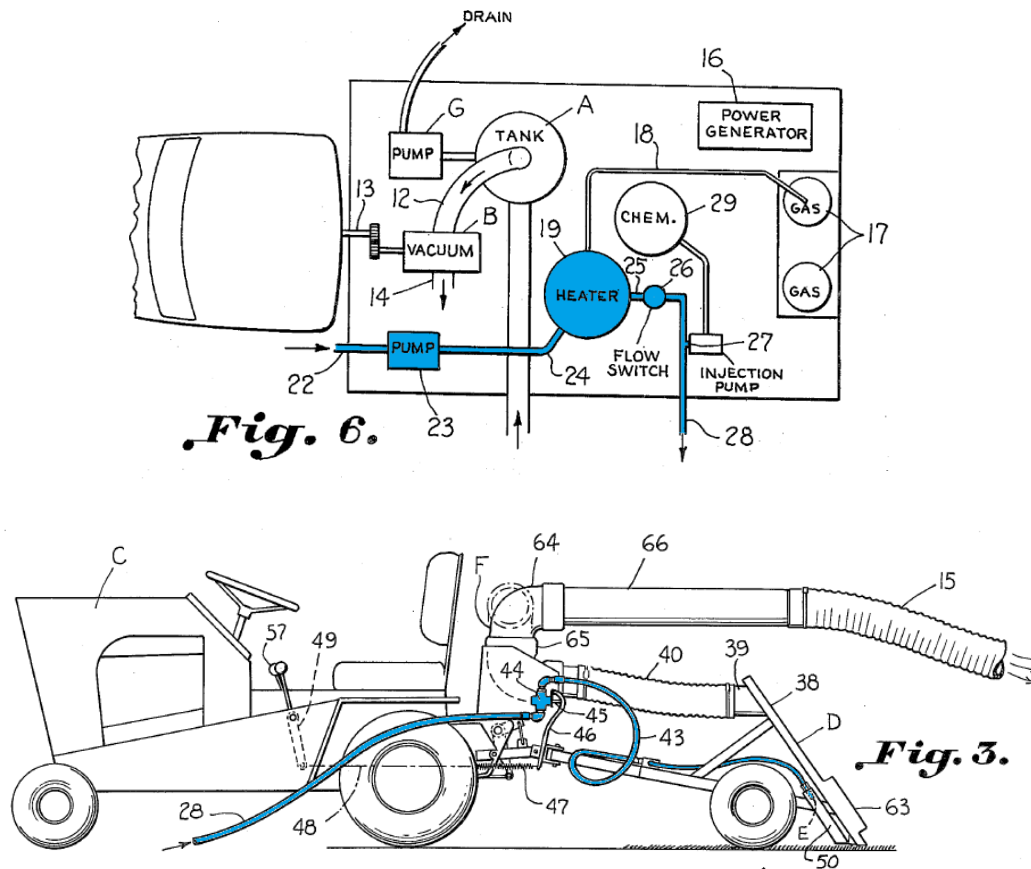
a pressure. Indeed, it is simply achieved by substituting an existing pump for a more powerful pump.

75. A POSA would have been motivated to substitute the pump in Jones for the pump in NLB to produce a more powerful and efficient cleaning system that would have been capable of cleaning various surfaces having varying levels of debris. These types of pumps are typically configured such that a user can change the pressure of the liquid leaving the pump. Thus, the cleaning system of Jones would be far more versatile with a more powerful pump that can be adjusted to produce liquid at different pressures. Accordingly, it is my opinion that it would have been obvious to a POSA to modify Jones to include the a more powerful pump that can produce liquids between 25,000 and 40,000 psi.

c. “said pump connected to a mobile blast head by a high pressure hose”

76. Jones discloses that the water is supplied from line 22 to pressure booster pump 23. Jones further discloses that “[t]his pressurized water is fed through piping 24 to the heater 19 The water is fed from the heater by piping 25 through a flow control switch 26, a chemical injection pump 27, through hose 28 to the cleaning head D carried on the motorized vehicle C.” *Blasters-1002* at 2:62-68. In other words, the pump is fluidly connected to the blast head by a hose designed to carry the pressurized water (*i.e.*, a pressurized hose). The flow path of the water from

the pressure booster pump to the cleaning head is emphasized in the drawings below using blue color:



Blasters-1002 at FIGS. 3 and 6 (annotated)

77. It is my opinion that the cleaning head D disclosed in Jones, which includes the suction nozzle and the spray nozzles, is equivalent to the “mobile blast head” limitation of claim 1. As previously explained, I understand “blast head” to mean a mechanical component having one or more nozzles for ejecting a substance

onto a surface. Cleaning head D includes a nozzle and is therefore equivalent to the blast head in claim 1.

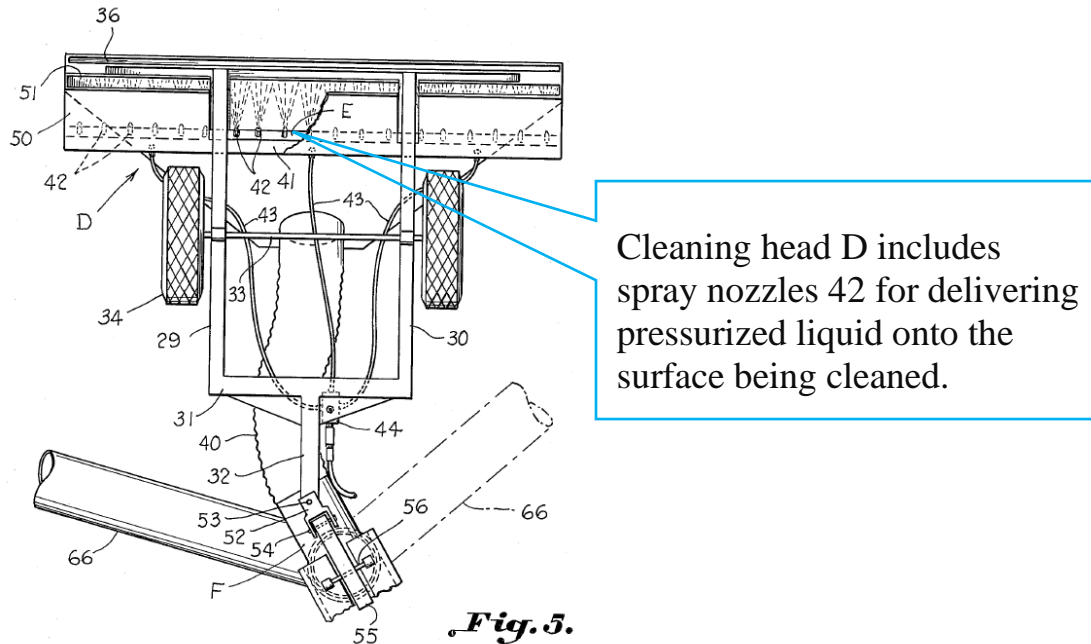
78. With respect to the “high pressure hose,” claim 1 does not impose any quantitative limitations on the qualitative term “high.” Thus, any hose capable of carrying a liquid at a pressure above the ambient pressure satisfies this limitation. Furthermore, it would have been obvious to a POSA to remove the heater from the cleaning system disclosed in Jones and replace hoses 24, 25, and 28 with a single hose carrying pressurized water from the pump to the cleaning head. This modification would simplify the cleaning system of Jones, would have been straightforward, not requiring undue experimentation, and would have produced predictable results. For all these reasons, Jones teaches or suggests “said pump connected to a mobile blast head by a high pressure hose.”

79. Furthermore, NLB obviously uses a high pressure hose to deliver fluid at 40,000 psi to the blast head. Logically, a POSA would understand that high pressure hoses are required to deliver high pressure fluids. Thus, in modifying Jones to discharge fluid pressurized between 25,000 and 40,000 psi, a POSA would have undoubtedly further modified Jones to include a hose between the pump and the blast head that is adapted to deliver fluids having a pressure of 40,000 psi. Such a hose would more than qualify as a high pressure hose. Accordingly, the limitation

“said pump connected to a mobile blast head by a high pressure hose” is obvious in view of Jones and is also obvious in view of Jones and NLB.

d. “said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface”

80. It is my opinion that Jones discloses the limitation “said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface.” As previously explained, cleaning head D is equivalent to the claimed blast head. Jones discloses the cleaning head D having a “sprayer means E [that] includes an elongated tubular member 41 which has *spray nozzles 42* spaced therein.” *Blasters-1002* at 3:36-37 (emphasis added). Pressurized cleaning medium is supplied to the nozzles via hose 28. *Id.* at 3:38-39. As depicted below, the pressurized cleaning medium is sprayed from the nozzles onto the surface being cleaned. *Id.* at Abstract.



Blasters-1002 at FIG. 5 (annotated)

81. Because the cleaning medium is at a pressure above the ambient atmospheric pressure, the “high pressure nozzle” and “high pressure liquid” limitations of claim 1 of the ‘116 Patent is taught in Jones. Therefore, Jones teaches “said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface.”

82. Even if the term “high pressure” is construed to mean a pressure between 25,000 and 40,000 psi, the limitation is still obvious over Jones in view of NLB. As I have explained in previous sections, NLB discloses a cleaning system that is adapted to discharge liquid pressurized at 40,000 psi, and a POSA would have been motivated to modify Jones to include a pump adapted to deliver liquid at 40,000

psi to make a more powerful, efficient, and versatile cleaning system. The NLB cleaning system also clearly includes hoses and nozzles for discharging said pressurized liquid. *Id.* at pg. 4. A POSA would have certainly understand that NLB's hoses and nozzles would be operable for liquids pressurized at 40,000 psi, which would most definitely be considered high pressure hoses and nozzles. Moreover, a POSA would have known that Jones' nozzles and hose would need to be substituted for a hose and nozzles that could withstand liquids pressurized to 40,000 psi. The hose and nozzles on these cleaning systems are interchangeable and easily replaced. Thus, a POSA would have undoubtedly updated the hoses and nozzles with what could only be considered high pressure hoses and nozzles. Accordingly, the limitation "said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface" is further obvious in view of Jones and NLB.

- e. "a waste removal hose connected at one end to said blast head and at the other end to a sump for collection of liquid and coatings therefrom"

83. Jones discloses a vacuum hose, extending from the vacuum tank to the cleaning head. *Blasters-1002* at 2:41-43 ("Communicating with the bottom of the tank A is an elongated vacuum hose 15 which extends to the cleaning head D carried by the motorized vehicle C."). The vacuum hose of Jones is connected to a suction nozzle residing on the cleaning head. *Id.* at 1:62 – 2:2. The foreign matter and liquid

removed from the surface being cleaned are conveyed through the suction nozzle to the vacuum tank via the vacuum hose. *Id.* at Abstract, 2:28-30. FIGS. 3 and 6 of Jones depicting the waste removal hose are reproduced and annotated below:

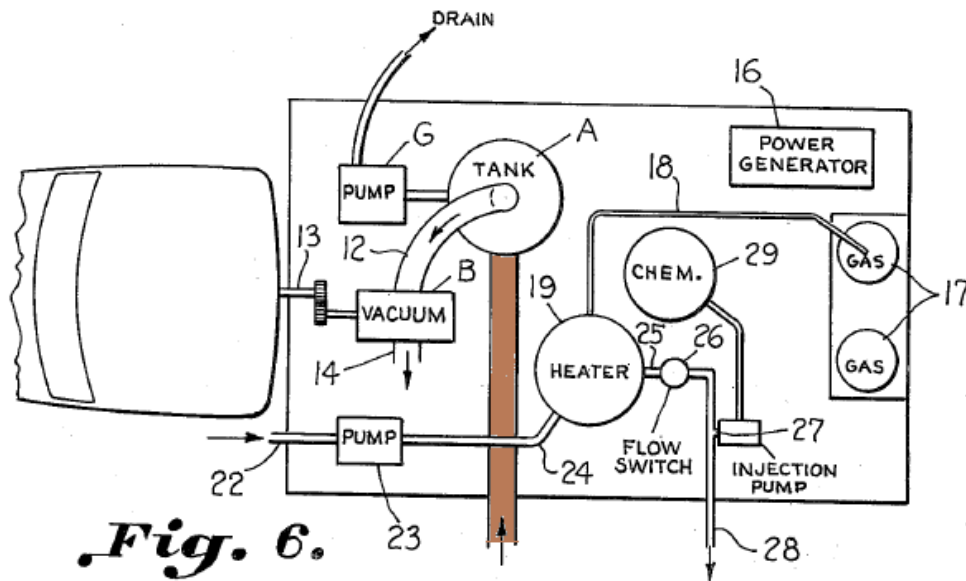


Fig. 6.

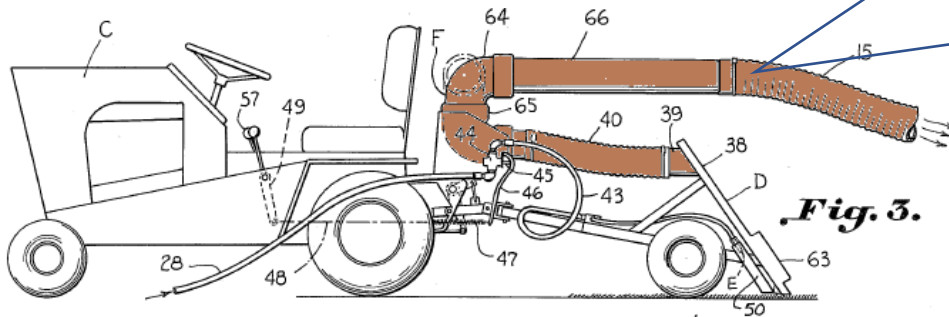


Fig. 3.

The first end of the vacuum hose is connected to the vacuum tank, and the second end is connected to the cleaning head carried by the utility vehicle.

Blasters-1002 at FIGS. 6 and 3 (annotated)

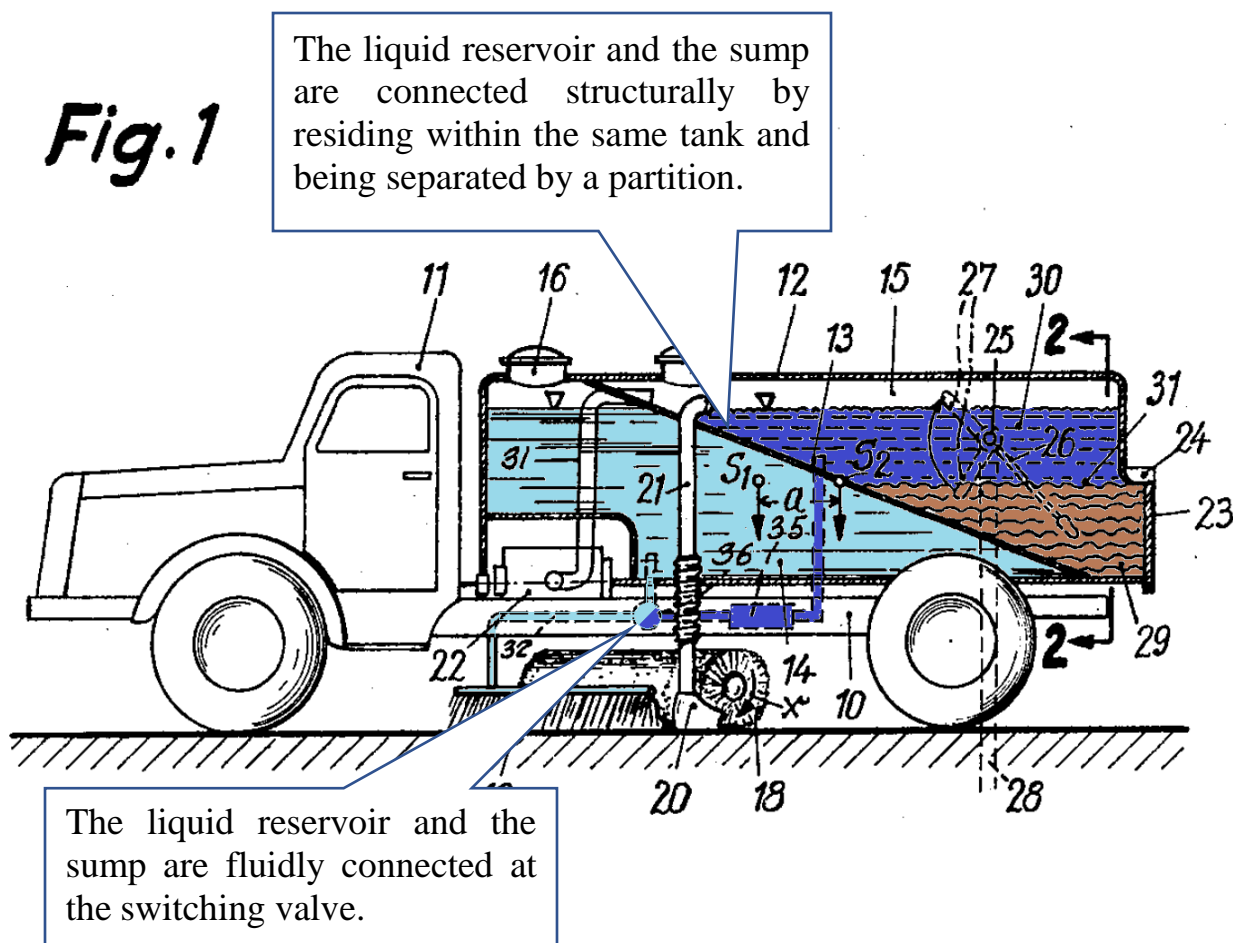
84. When the cleaning system of Jones is modified in view of Breither, the vacuum tank of Jones is replaced with “mud container” (*i.e.*, sump) disclosed Breither. In this combination, the vacuum hose would be coupled to the sump and would be used to convey spent liquid and removed foreign matter to the sump.

85. Thus, Jones in view of Breither teaches “a waste removal hose connected at one end to said blast head and at the other end to a sump for collection of liquid and coatings therefrom.”

f. “said sump connected to said liquid reservoir”

86. As explained in paragraph 62, a POSA would have been motivated to modify Jones to include the liquid reservoir in Breither because placing the water supply directly onto the truck in Jones would have resulted in a cleaning system that is independent of any external water supply, thereby enabling the cleaning system to be used in a wider variety of settings including those where a municipal water connection is not readily available. In introducing the liquid reservoir to the cleaning system disclosed in Jones, a POSA would adhere to the teachings of Breither directing the POSA to dispose the liquid reservoir and the sump within a partitioned tank to achieve the advantages recited in Breither. Specifically, Breither discloses that a tank having a diagonal partition separating the water reservoir and the sump enables the truck to maintain a consistent center of gravity. *Blasters-1003* at 2:1-7. Breither further explains that by fluidly coupling the sump to the water reservoir,

spent water collected from the surface being cleaned can be reused thereby extending the duration of continuous operation of the cleaning system and reducing the amount of fresh water used by the system. *Id.* at 1:54-62. The connection—both fluid and structural—between the sump and the liquid reservoir is illustrated in FIG. 1 of Breither, which is reproduced and annotated below:



Blasters-1003 at FIG. 1 (annotated)

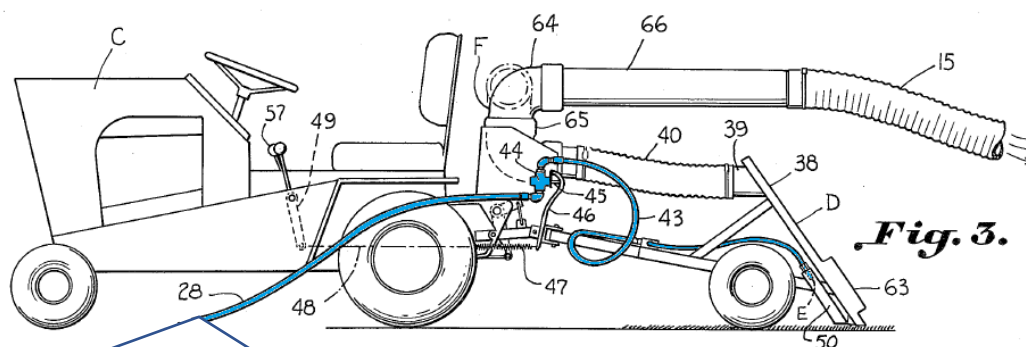
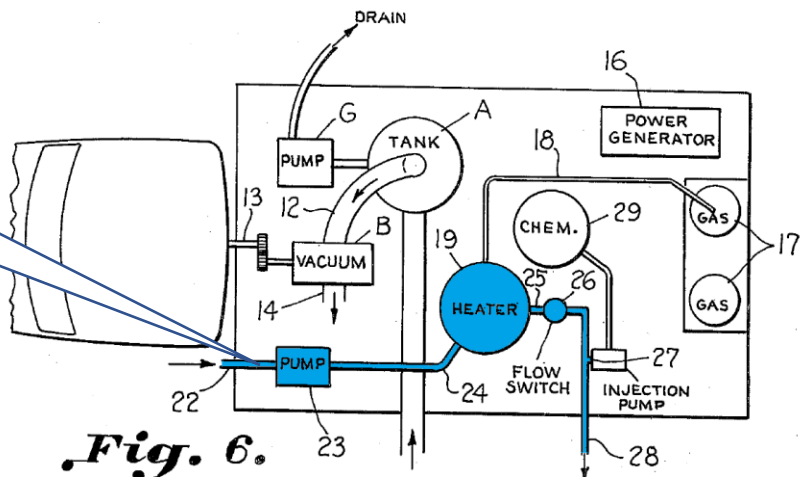
87. Thus, Breither discloses “said sump connected to said liquid reservoir.”

Accordingly, the limitation “said sump connected to said liquid reservoir” is obvious over Jones in view of Breither.

g. “whereby liquid is pumped through said high pressure hose from said reservoir and exits said high pressure nozzle onto the hard surface for removing coatings therefrom”

88. In my opinion, Jones in combination with Breither discloses “whereby liquid is pumped through said high pressure hose from said reservoir and exits said high pressure nozzle onto the hard surface for removing coatings therefrom.” Jones explains that “water is supplied to line 22 shown in FIG. 6 from any suitable source . . . and is fed through an electrically operated pressure booster pump 23 which builds the pressure of the water to approximately 200 pounds per square inch.” *Blasters-1002* at 2:57-62. Jones further discloses that the “pressurized water flow[s] through the hose 28” and that “the water is fed . . . through hose 28 to the cleaning head D.” *Id.* at 3:3-4, 2:65-68. Hose 28 connects to sprayer means E, which includes spray nozzles 42 from which the pressurized cleaning solution is sprayed onto the surface being cleaned. *Id.* at 3:36-37, FIG. 3. FIGS. 3 and 6 of Jones illustrate the pressurized water delivery system, which is emphasized in blue:

Water is pumped from supply line 22 through hose 28 by pump 23.



Pressurized cleaning solution is delivered to spray nozzles 42 via hose 28. The cleaning solution is sprayed from the spray nozzles onto the surface being cleaned to dislodge the foreign matter from the surface.

Blasters-1002 at FIGS. 6 and 3 (annotated)

89. Jones does not explicitly disclose that the water is being supplied from a liquid reservoir. However, Breither discloses a fresh-water reservoir. As established in paragraph 62, *supra*, a POSA would have been motivated to combine Jones with Breither such that the fresh-water reservoir of Breither is used as “any suitable source” of water disclosed in Jones. *Id.* 2:57-58. As a result of the combination, the fresh-water reservoir in Breither is the source of water that is fed

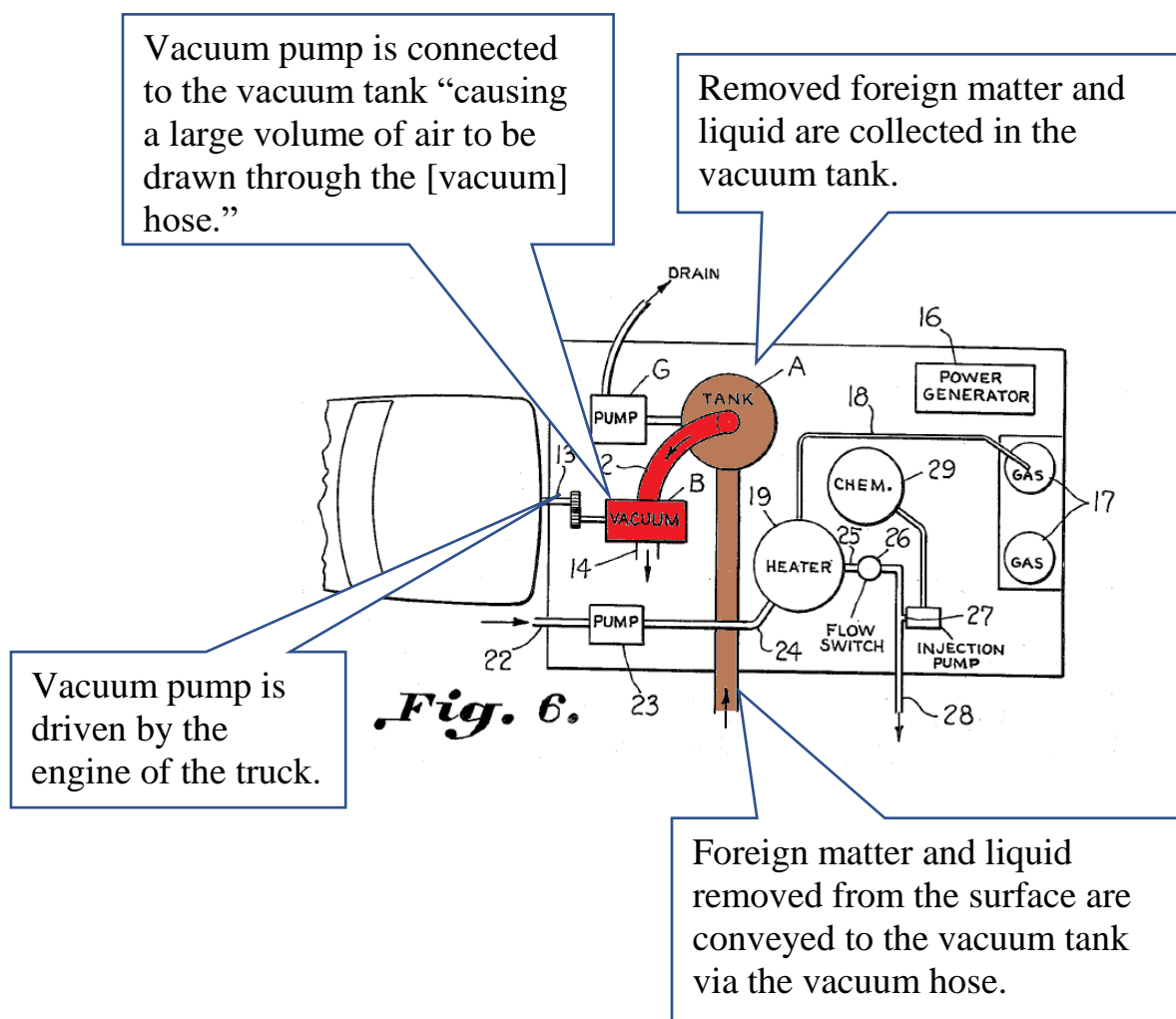
into the pressure booster pump of Jones and ultimately exits through the nozzle onto the surface to be cleaned. This modification would improve the cleaning system of Jones by making it self-contained and independent of an external water supply. Thus, Jones in view of Breither teaches that “liquid is pumped through said high pressure hose from said reservoir and exits said high pressure nozzle onto the hard surface for removing coatings therefrom” as recited in claim 1.

90. Furthermore, it would have been obvious for a POSA to modify the combination of Jones and Breither with the hose and nozzles designed for “ultra-high pressure” disclosed in NLB. *See* Part VIII(B)(4), *supra*. Therefore, the limitation “whereby liquid is pumped through said high pressure hose from said reservoir and exits said high pressure nozzle onto the hard surface for removing coatings therefrom” is obvious in view of the combination of Jones, Breither, and NLB.

- h. “said liquid and coatings conveyed through said waste removal hose to said sump via a high power vacuum pump, said coatings collected in said sump”

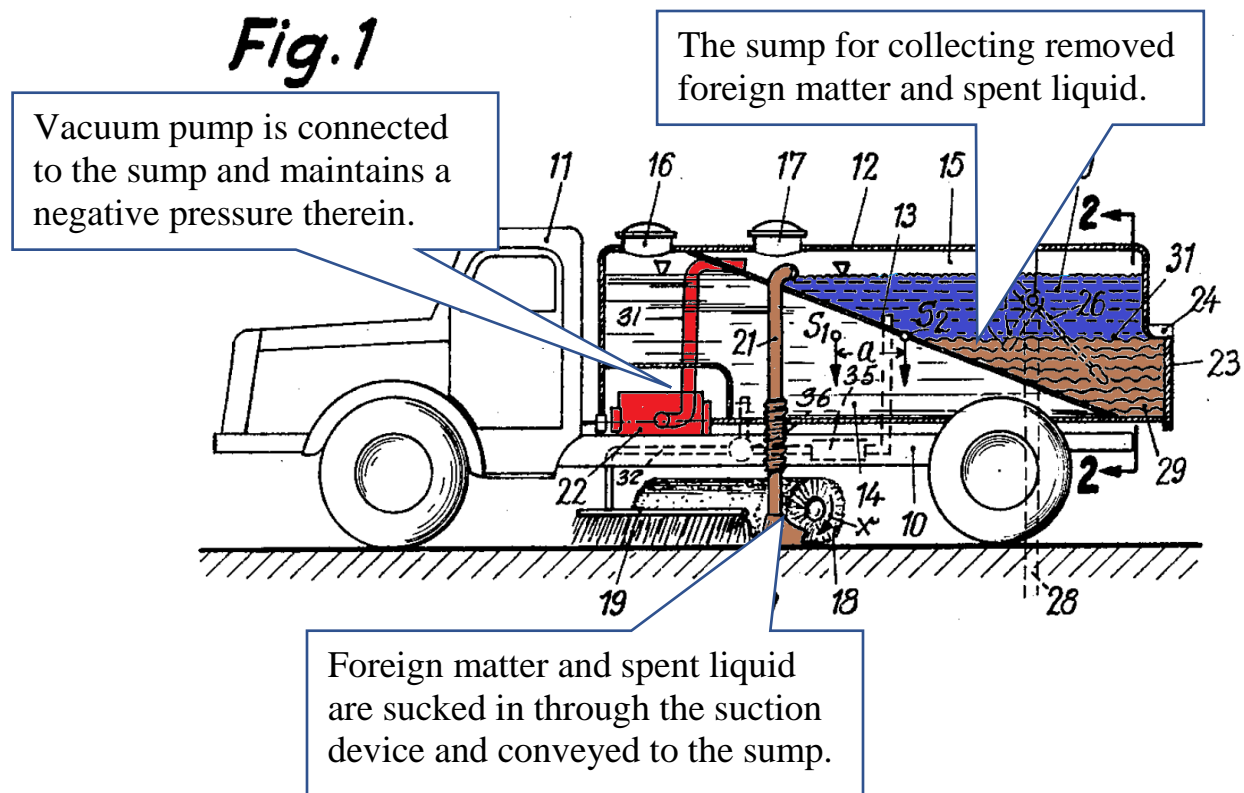
91. It is my opinion that Jones in combination with Breither discloses “said liquid and coatings conveyed through said waste removal hose to said sump via a high power vacuum pump, said coatings collected in said sump.” Specifically, Jones teaches that “the used cleaning medium and foreign matter [are] removed from the turf.” *Blasters-1002* at 6:15-16. Jones also discloses a vacuum tank A and a vacuum

pump that “communicates with the tank A causing a large volume of air to be drawn through the hose.” *Id.* at 1:59-63. The removed liquid and foreign matter are conveyed away from the surface being cleaned and into the vacuum tank via the vacuum hose. *Id.* at 2:28-36. Jones further discloses that the vacuum pump is “the engine of the vehicle 10 is used for driving the vacuum pump.” *Id.* at 2:32-27. These components of Jones are depicted in FIG. 6, which is reproduced and annotated below:



Blasters-1002 at FIG. 6 (annotated)

92. Breither discloses a mud container (*i.e.*, a sump) for collecting liquid and debris removed from the surface being cleaned. *Blasters-1003* at 3:6-16. Breither further discloses a vacuum pump connected to the sump for maintaining a vacuum therein. *Id.* at 2:56-60. Like Jones, Breither also states that the vacuum pump may be coupled to the engine of the vehicle. *Id.* at 2:53-56. Thus, it would have been within the ordinary skill in the art to replace the vacuum tank disclosed in Jones with the sump disclosed in Breither. The motivation for this modification would be to enable the cleaning system to reuse spent liquid after it has been separated from debris via settling within the sump. The waste removal system of Breither is illustrated in the annotated FIG. 1 reproduced below:



93. With respect to qualitative terms “high power” used to describe the vacuum pump, claim 1 of the ‘116 Patent does not impose any quantitative restrictions on what constitutes “high power.” Although the specification of the ‘116 Patent states that “[t]he intake of a high power vacuum pump [is] capable of approximately 1,100 CFM (cubic feet per minute),” this excerpt only explains that a pump with an intake of approximately 1,100 CFM qualifies as a high power vacuum pump. *See* Blasters-1001 at 3:47-49. The ‘116 Patent fails to identify a lower quantitative boundary for what intake values are required for a vacuum pump to qualify as a high power. Instead, the ‘116 Patent clarifies that the object of the invention is to provide “a vacuum recovery system for the water and debris being generated.” *See id.* at 2:55-56. Accordingly, I understand the term “high power vacuum pump” to mean “having greater than normal strength or capabilities.”

94. Both Jones and Breither disclose systems having vacuum pumps adapted to lift liquid and roadway debris, which is the objective of the vacuum recovery system in the ‘116 patent. Accordingly, it is my opinion that the vacuum pumps in both Jones and Breither qualify as high power in accordance with the claims in the ‘116 Patent.

95. For the reasons set forth above, Jones in view of Breither teaches “said liquid and coatings conveyed through said waste removal hose to said sump via a high power vacuum pump, said coatings collected in said sump.”

96. Furthermore, should the term “high power vacuum pump” be construed to mean an intake of approximately 1,100 cfm, NLB discloses a vacuum pump having 1,000 cfm, which is approximately 1,100 cfm. A POSA would have been motivated to use a stronger vacuum pump to ensure that the cleaning system can recover a maximum amount of liquid and debris during operation. Accordingly, the limitation “said liquid and coatings conveyed through said waste removal hose to said sump via a high power vacuum pump, said coatings collected in said sump” is obvious over Jones in view of Breither and NLB.

i. “said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame”

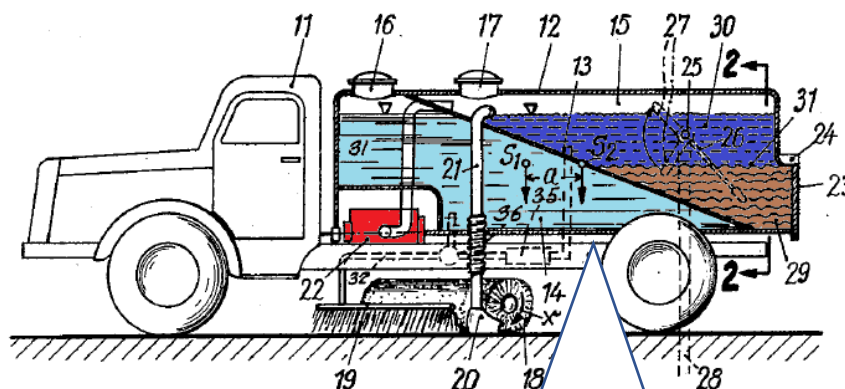
97. In my opinion, the limitation “said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame” is obvious over Jones in view of Breither. A consistent interpretation of the term “mounted” as used in the specification and the claims of the ‘116 Patent, results in a POSA concluding that the term “mounted” means directly or indirectly attached. For example, the ‘116 Patent states, “[m]ounted on the bed **12** of the truck is the water reservoir **13**[,] the sump **14** or vacuum chamber” and the vacuum pump. *Blasters-1001* at 3:35-36, 3:49-50. The claims require that these components be mounted on a mobile frame,

while the specification indicates that these components are mounted on the bed of the truck. If the language of the claims and specification are interpreted consistently, the mounting of the water reservoir, sump, and vacuum pump on the *bed* of the truck qualifies as mounting the same components on the *mobile frame*, or *i.e.*, the term “mounted” means both directly and indirectly attached.

98. Jones discloses that the vacuum tank, the vacuum pump, and the pressure booster pump are all carried on the bed portion of the support truck or *i.e.*, indirectly attached to the chassis of the support truck. *Blasters-1002* at FIG. 6. Jones does not explicitly disclose the liquid reservoir. Breither, however, discloses “a truck having a chassis 10, and a tank 12 mounted thereon behind driver’s cab 11.” *Blasters-1003* at 2:21-24. Breither discloses that tank 12 comprises “the front container 14 serv[ing] as a fresh-water container” and “the rear container 15 serv[ing] as a mud container.” *Id.* at 2:29-33. Breither further discloses a vacuum pump mounted on the chassis of the truck. *Id.* at 2:53-55.

99. Thus, Breither discloses the liquid reservoir, the sump, and the vacuum pump mounted onto the chassis of the truck as illustrated in the annotated FIG. 1 reproduced below:

Fig.1



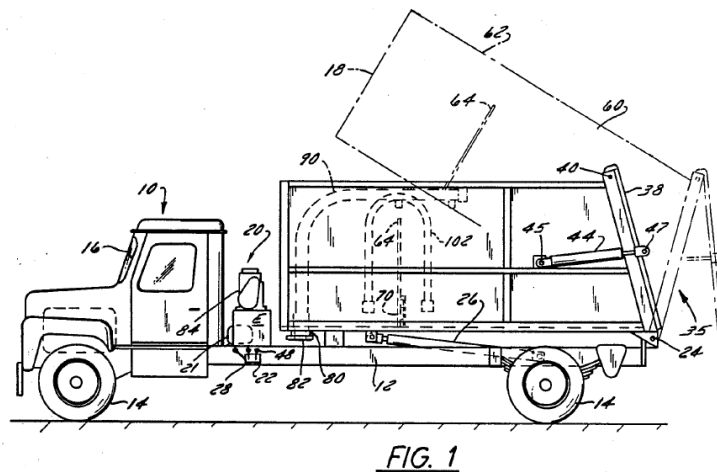
The liquid reservoir, the sump, and the vacuum pump are mounted onto the chassis of the truck.

Blasters-1003 at FIG. 1 (annotated)

100. As clearly evident from FIG. 1 of Breither and the accompanying disclosure, Breither teaches that the fresh-water container (*i.e.*, liquid reservoir), the mud container (*i.e.*, sump), and the vacuum pump are mounted onto the chassis of the truck. It would have been obvious to modify Jones to include tank 12 of Breither for the reasons discussed in paragraph 62, *supra*. In making this modification, a POSA would follow the teachings of Breither and would mount tank 12 and vacuum pump 22 onto the chassis—*i.e.*, mobile frame—of the service truck of Jones. Thus, Jones in view of Breither teaches or suggests “said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame.”

101. Furthermore, it would have been obvious to improve the resulting cleaning system by replacing the vacuum pump with NLB's high-power, 1,000 CFM vacuum pump. *See supra* ¶ 93. Therefore, the limitation "said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame" is obvious in view of the combination of Jones, Breither, and NLB.

102. Even if the term "mobile frame" is construed to mean that the flat bed portion is movable (*i.e.*, pivotal) with respect to the truck, I still believe this limitation would have been obvious. Specifically, it would have been obvious to modify the combination of Jones, Breither, and the NLB Brochure with Sloan to create a system having a pivotal frame. Sloan discloses a truck having a sump mounted onto a "tiltable dump body." *Blasters-1007* at Abstract; FIG. 1.



Blasters-1007 at FIG. 1

103. It would have been obvious to improve the modified version of the truck in Jones having the tank 12 from Breither by including the tiltable frame from Sloan. This combination would facilitate removal of the foreign matter from the sump by allowing it to be tilted. Such modification would have been straightforward, would not require undue experimentation, and would produce predictable results.

j. “said mobile frame forming an integral part of a truck having a bed portion and a cab portion, said truck being self-propelled”

104. In my opinion, both Jones and Breither disclose a “mobile framing forming an integral part of a truck having a bed portion and a cab portion, said truck being self-propelled.” As depicted below in reproduced Fig. 1 of Jones, a mobile frame (emphasized in orange) forms an integral part of the support truck 10. The chassis of the truck is a frame and it is mobile because it is connected to the wheels of the truck. Thus, the chassis in Jones is a mobile frame forming an integral part of a truck.



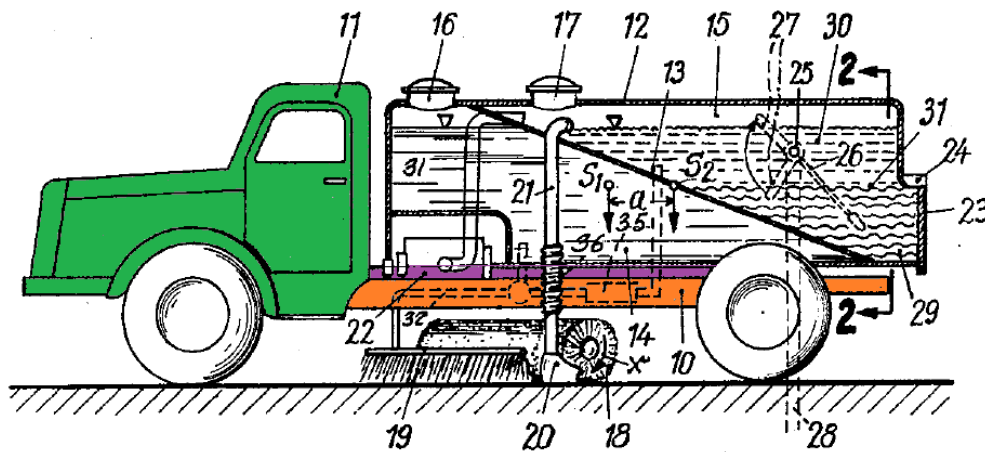
Blasters-1002 at FIG. 1 (annotated)

105. Jones further discloses a cab portion (emphasized in green) and a bed portion (emphasized in purple). The cab portion of the truck in Jones is clearly a typical driver cabin or “cab” in which a driver operates the vehicle. The “flat bed body 11” (*i.e.*, the rearward support structure of a truck) of the truck in Jones is rearward of the cab and provides a support structure for the truck. *See* Blasters-1002 at 2:20-21. The flat bed body is equivalent to the claimed bed portion of a truck.

106. As depicted below in reproduced Fig. 1, Breither discloses a chassis 10 (emphasized in orange), which is an integral part of the truck. As previously

explained, a chassis is a frame of a truck connected to wheels, *i.e.*, a mobile frame. The truck further includes a “driver’s cab” (emphasized in green) and the rearward support structure is the bed portion (emphasized in purple) of the truck. *Blasters-1003* at 2:21-24.

Fig.1



Blaster-1003 at FIG. 1 (annotated)

107. Both Jones and Breither further disclose that their respective trucks have engines and, therefore, are “self-propelled.” See *Blasters-1002* at 2:35; *Blasters-1003* at 2:56. Therefore, Jones in view of Breither teaches “said mobile frame forming an integral part of a truck having a bed portion and a cab portion, said truck being self-propelled.”

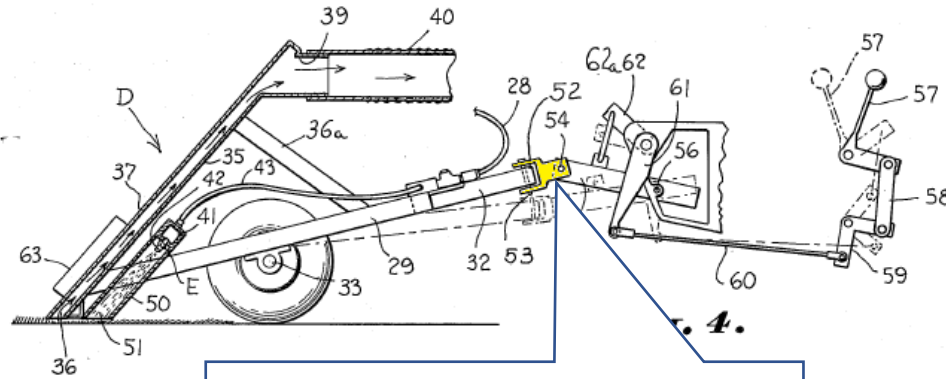
- k. “said mobile blast head being mounted at a distal end of an articulating link, a proximal end of said articulating link secured to a tractor”

108. In my opinion Jones discloses the limitation “said mobile blast head being mounted at a distal end of an articulating link, a proximal end of said articulating link secured to a tractor.” Specifically, Jones discloses the following:

[t]he means for selectively raising and lower the cleaning head D from a cleaning position to a transporting position includes a swivel joint 52 which is pivotally connected by means of a bolt 53 to the tongue 32 of the frame upon which the cleaning head D is supported. A transverse pin 54 is provided between bifurcated ends of the swivel 52 for coupling the tongue 32 to an elongated bar—type member 55 carried on the motorized vehicle.

Blasters-1002 at 3:63 – 4:3.

109. In other words, a connecting structure (*i.e.*, a link) is attached to the tractor at a proximal end and attached to the blast head at the distal end. The swivel joint for connecting the cleaning head to the mobile utility vehicle is illustrated in FIGS. 4 and 5 of Jones, which are reproduced and annotated below, wherein the swivel joint is emphasized in yellow:



The cleaning head D is connected to the motorized utility vehicle C via a swivel joint—i.e., an articulating link.

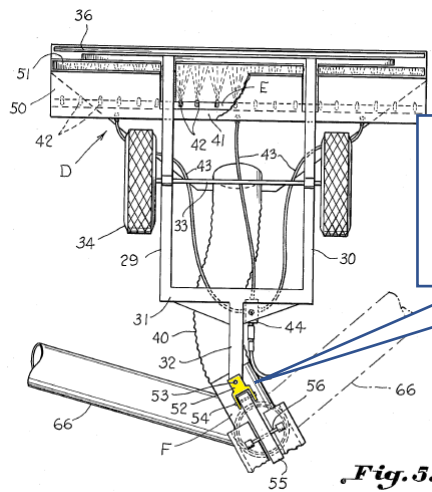


FIG. 5 of Jones depicts the top view of the swivel joint.

Fig. 5.

Blasters-1002 at FIGS. 4-5 (annotated)

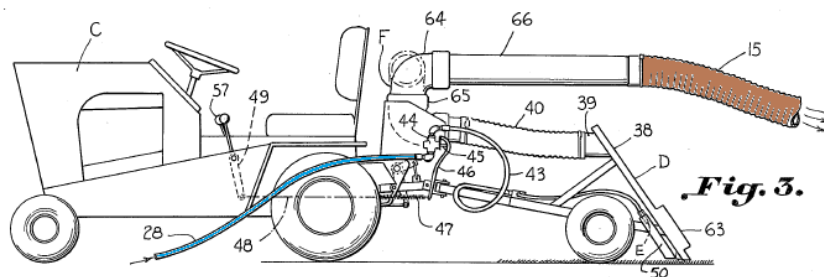
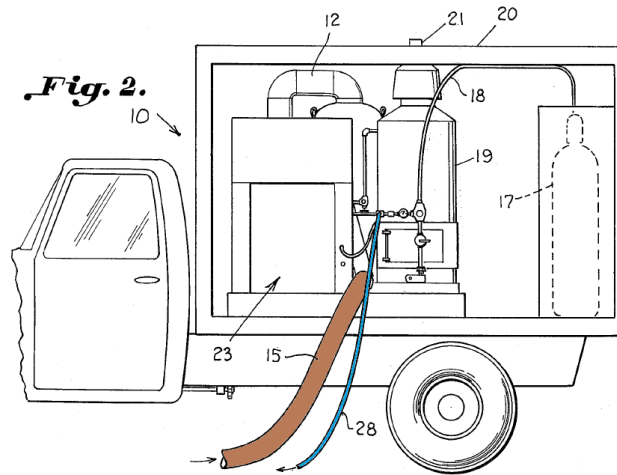
110. Based on the disclosure of Jones, the swivel joint in the connecting structure allows relative movement between the blast head and the tractor. Accordingly, Jones discloses “said mobile blast head being mounted at a distal end of an articulating link, a proximal end of said articulating link secured to a tractor.”

l. “said tractor including an engine for propulsion thereof”

111. Jones discloses that “[t]he *motorized* vehicle C may be any suitable conventional utility vehicle, such as generally used for mowing large areas, or it may be a conventional general purpose tractor that has a hitch connection suitable for pulling the cleaning head D.” *Id.* at 3:10-14 (emphasis added). The term “motorized” signifies that the utility vehicle has an engine for propulsion thereof. Thus, Jones teaches “said tractor including an engine for propulsion thereof.”

m. “wherein said high pressure hose and said waste removal hose extend between said truck and said tractor”

112. It is my opinion that the limitation “wherein said high pressure hose and said waste removal hose extend between said truck and said tractor” is disclosed in Jones. Jones discloses that a vacuum hose and a water hose extend from the service truck to the cleaning head, which is connected to the motorized utility vehicle. *Id.* at 1:59-65; 2:65-68. When considered in combination, FIGS. 2 and 3 of Jones clearly illustrate that the vacuum hose (emphasized in brown) and the water hose (emphasized in blue) extend between the truck and the utility vehicle:



Blasters-1002 at FIGS. 2 and 3 (annotated)

113. Accordingly, Jones teaches “wherein said high pressure hose and said waste removal hose extend between said truck and said tractor.”

114. Furthermore, as established in paragraph 79, it would have been obvious to replace hose 28 of Jones with the hose disclosed in NLB, which is designed for “ultra-high pressure.” Thus, Jones in view of NLB renders obvious the limitation “wherein said high pressure hose and said waste removal hose extend between said truck and said tractor.”

n. “whereby said tractor is utilized to maneuver said blast head”

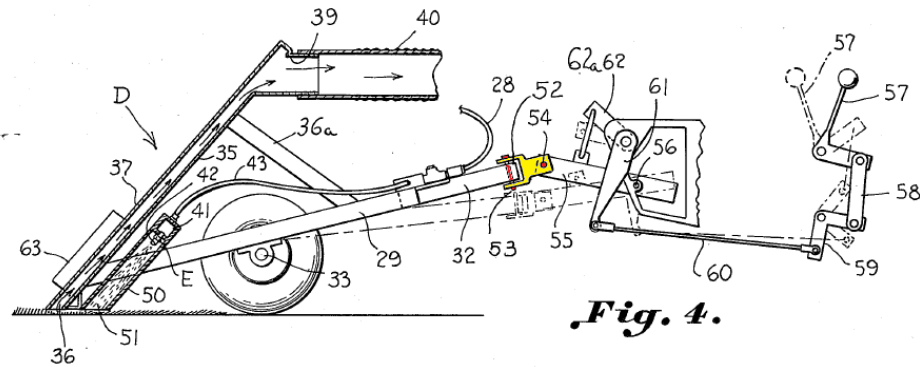
115. It is my opinion that the tractor in Jones is utilized to maneuver the blast head. Jones discloses that “cleaning head having a suction nozzle and spray nozzles which is pulled behind a motorized utility vehicle.” *Id.* at Abstract. Because the cleaning head is pulled behind the motorized utility vehicle, the path of the utility vehicle dictates the path of the cleaning head. For example, if the utility vehicle turns right, the cleaning head will follow and will also turn right. The same is true for the opposite direction. Thus, Jones teaches the limitation “whereby said tractor is utilized to maneuver said blast head.”

3. Claim 2

116. Claim 2 of the ‘116 Patent depends from claim 1 and contains a single additional limitation: “wherein a high power vacuum pump is connected to said sump.” In my opinion, both Jones and Breither disclose this limitation. Jones discloses that “[a] vacuum pump B communicates with the tank A.” *Id.* at 1:62-63. Breither discloses that “[p]ump 22 is connected by means of pipe 31 to the inside of mud container 15.” *Blasters-1003* at 2:53-58. Moreover, it would have been obvious to replace the vacuum pump of Jones with the NLB’s high power, 1,000 CFM vacuum pump. *See supra* at ¶ 93. Thus, claim 2 of the ‘116 Patent is disclosed in both Jones and Breither.

4. Claim 10

117. Claim 10 depends from claim 1 and recites the following additional limitation: “said articulating link is constructed and arranged for controlled movement in a horizontal and a vertical plane.” In my opinion, Jones discloses this limitation. Jones includes a cleaning head connected to the motorized utility vehicle via a linkage mechanism. *Blasters-1002* at 4:7-12. Jones discloses that the linkage mechanism includes a handle, which can be manipulated to raise and lower the cleaning head—*i.e.*, controlled movement in a vertical plane. *Id.* at 4:7-16. Jones also discloses a swivel joint 52 that enables the cleaning head to move in a horizontal plane about bolt 53. *Id.* at 3:64-66. The movement of the articulating link in the horizontal plane is dictated by the path of the utility vehicle to which the cleaning head is connected. Thus, the driver of the utility vehicle controls the movement of the articulating link in the horizontal plane by controlling the path of the utility vehicle. Accordingly, the linkage mechanism (*i.e.*, articulating link) in Jones is constructed and arranged, via swivel joint 52 and transverse pin 54, for controlled movement in a horizontal and a vertical plane. FIG. 4 of Jones is reproduced below with the swivel joint emphasized in yellow, and bolt 53 and transverse pin 54 emphasized in red:



Blasters-1002 at FIG. 4 (annotated)

118. Furthermore, it would have been obvious to a POSA to modify the linkage system of Jones to enable handle 57 to move laterally, whereby lateral movement of handle 57 would control movement of swivel joint 52 in the horizontal plane about transverse pin 54. Accordingly, Jones teaches the limitation “said articulating link is constructed and arranged for controlled movement in a horizontal and a vertical plane” as recited in claim 10.

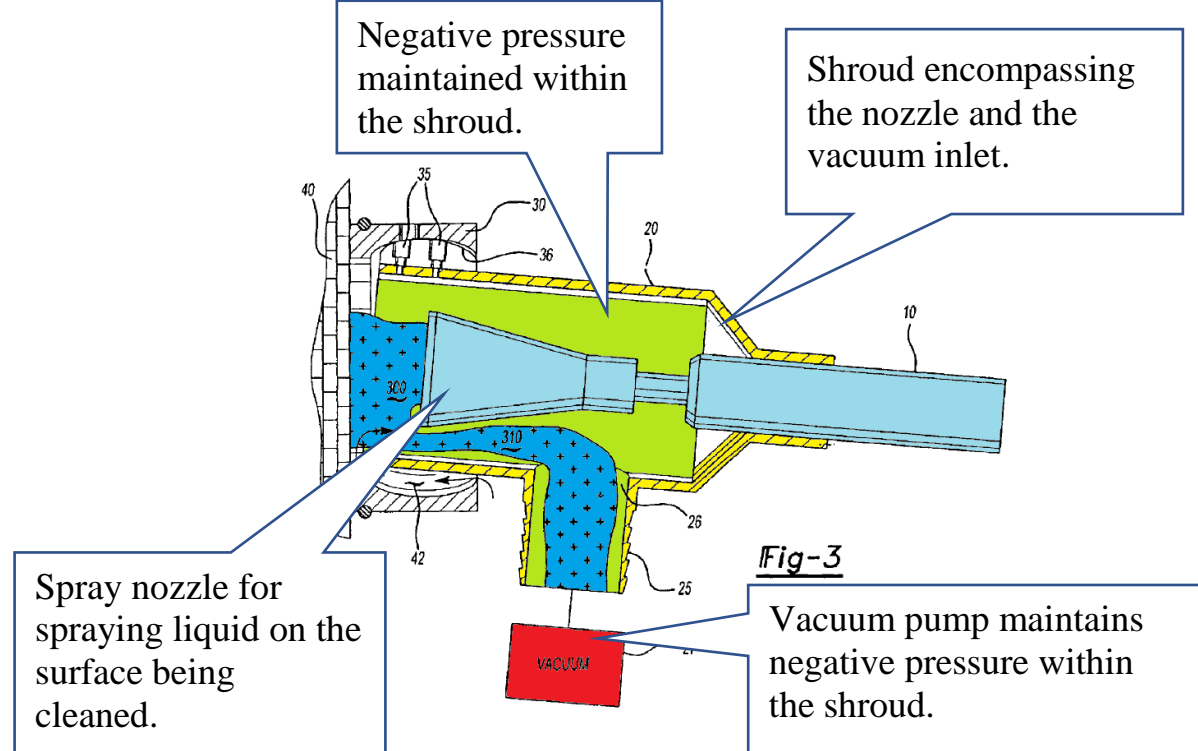
B. Ground 2: Claims 3 and 4 are obvious over Jones in view of Breither and further in view of Herhold

1. Claim 3

119. Claim 3 of the ‘116 Patent requires “a shroud [being] connected to said blast head, said shroud surrounds said at least one nozzle and forms a negative pressure chamber.” Jones discloses that “nozzles 42 are carried within an enclosure 50.” *Id.* at 4:50-51. Although Jones does not expressly disclose that the enclosure

surrounds both the spray nozzle and the suction nozzle, Jones states that spray nozzle ejects the cleaning solution “directly ahead of the suction nozzle.” *Id.* at 4:52-53.

120. Like Jones, Herhold also discloses a cleaning head having a spray nozzle and a suction inlet. Blasters-1004 at Abstract. Herhold discloses a “shroud assembly ha[ving] a stationary tubular sleeve spaced generally circumferentially about the outlet nozzle.” *Id.* Herhold further discloses that “the stationary tubular sleeve is provided with a laterally positioned outlet for attachment to a vacuum source to suction expelled fluid carrying loosened debris from the treated surface.” *Id.* FIG. 3 of Herhold illustrates the shroud surrounding the nozzle and having a vacuum source for maintaining a negative pressure within the shroud:



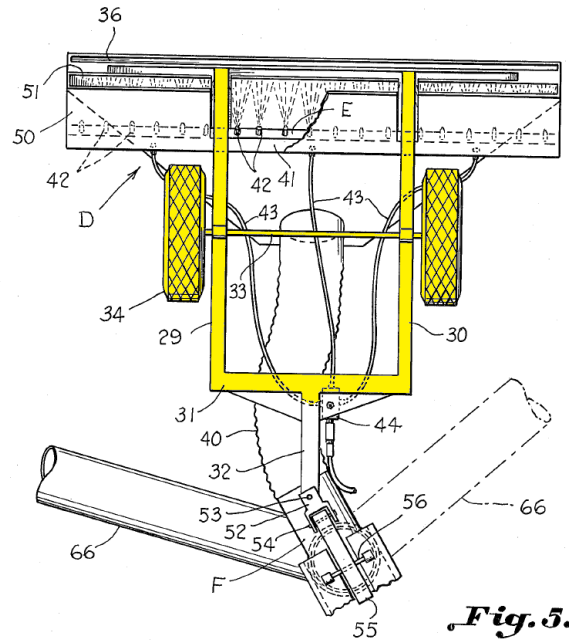
Blasters-1004 at FIG. 3 (annotated)

121. In my opinion, a POSA would have been motivated to modify the enclosure 50 disclosed in Jones with the shroud disclosed in Herhold. Enclosing the spray nozzle and the suction nozzle within a single shroud would eliminat[e] the chaotic discharge of elements from the outlet nozzle of the pressurized fluid spray device.” *Blasters-1004* at 1:39-40. Jones would thus be better suited to recover expelled fluid and resulting debris because both would be contained within the shroud. Such a modification would have been straightforward, would not have required undue experimentation, and would have produce predictable results.

122. Thus, Jones in view of Breither and further in view of Herhold teaches the limitation “a shroud is connected to said blast head, said shroud surrounds said at least one nozzle and forms a negative pressure chamber.” Therefore, claim 3 of the ‘116 Patent is obvious over this combination of the prior art.

2. Claim 4

123. Claim 4 of the ‘116 Patent requires that the “mobile blast head [be] attached to a wheeled chassis for maneuvering over the hard surface.” It is my opinion that Jones teaches this limitation. Jones discloses that “[a]n axle 33 is journaled on the frame members 29 and 30 and has wheels carried thereon for transporting the cleaning head.” *Blasters-1002* at 3:18-21. The wheeled chassis is also depicted in FIG. 5 of Jones, which is emphasized in yellow color below:



Blasters-1002 at FIG. 5 (annotated)

124. Accordingly, Jones teaches the limitation “said mobile blast head [being] attached to a wheeled chassis for maneuvering over the hard surface” as recited in claim 4.

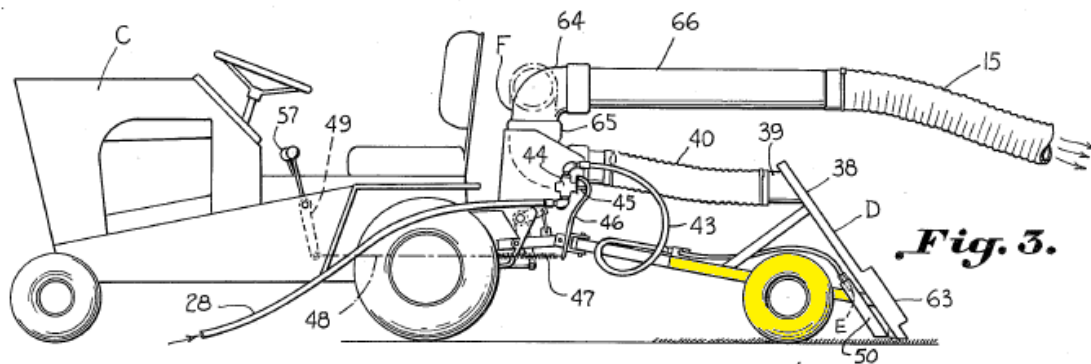
C. Ground 3: Claims 5 and 6 are obvious over combination of Jones, Breither, Herhold, and Schrunk

1. Claim 5

125. Claim 5 of the ‘116 Patent depends from claim 4 and includes the following limitations: (a) “wherein said wheeled chassis is attached to said tractor” and (b) “said mobile blast head and tractor are of a size for removably docking transversely on said bed portion of said truck.”

a. “wherein said wheeled chassis is attached to said tractor”

126. In my opinion, Jones discloses a wheeled chassis attached to the tractor. Jones explains that the cleaning head is attached to the tractor and the cleaning head includes a wheeled chassis. *Blasters-1002* at 3:13-23. Moreover, FIG. 3. of Jones clearly shows a wheeled chassis (emphasized in yellow) attached to the tractor. Thus, Jones teaches the limitation “said wheeled chassis is attached to said tractor.”



Blasters-1002 at FIG. 3 (annotated)

b. “said mobile blast head and tractor are of a size for removably docking transversely on said bed portion of said truck”

i. Size of the tractor and the blast head assembly is an obvious design choice

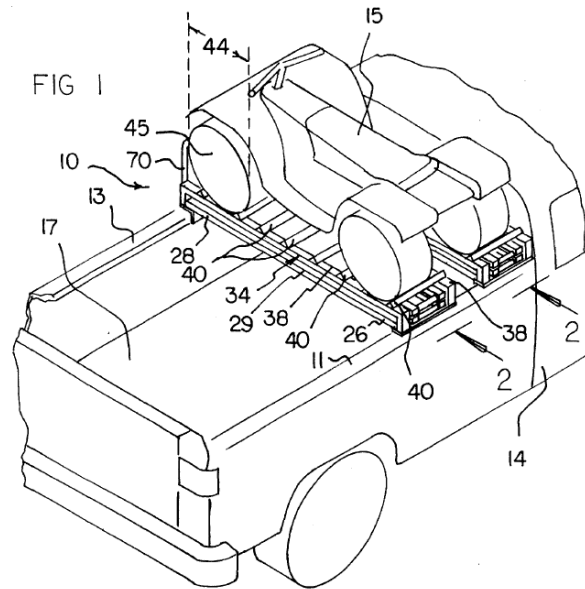
127. Claim 5 requires the blast head and tractor to be “of a size” for removably docking transversely on a truck bed. There are, however, no structural or quantifiable limitations. Similarly, the specification of the ‘116 Patent fails to identify any specific sizes for either the tractor or the blast head. Regarding the

tractor, the '116 Patent simply states that "the tractor is similar to a riding mower with a small engine." *Blasters-1001* at 3:64-65. The '116 Patent is devoid of any further detail regarding the specific independent sizes of the tractor and the blast head. Thus, any tractor with an attached blast head that can be docked transversely on a bed portion of a truck satisfies this limitation of claim 5.

128. Jones discloses a support truck having a flat bed body. *Blasters-1002* at 2:17-19. Jones also discloses a motorized utility vehicle with a cleaning head attached thereto. *Id.* at 1:66-67. Jones, however, does not explicitly state that the cleaning head and the motorized utility vehicle have a specific size to be removably docked transversely on the bed portion of the truck. Nevertheless, as explained below it would have been obvious to a POSA to select the tractor and the cleaning head of such sizes that their assembly could be transversely docked on the flat bed of the support truck.

129. The cleaning system disclosed in Jones requires concurrent presence of the service truck and the tractor with the cleaning head. These components must be deployed together at a work site to produce an operable system. Jones further explains that the disclosed cleaning system is "portable." *Id.* at Abstract. Thus, a POSA would have understand that it would be beneficial for the service truck and the tractor with the cleaning head to be transported together to a job site as a cohesive unit.

130. Thus, a POSA would have considered the available options for transporting a tractor on a truck. Schrunk explains that a utility vehicle (*i.e.*, a tractor) can be transported transversely on the bed portion of a truck. Blasters-1005 at Abstract. Schrunk describes advantages for transversely stowing a utility vehicle on the bed portion of a truck, including the ability to load and unload the utility vehicle without having to move it in reverse. *Id.* at 1:50-60, 4:32-25. As shown below in reproduced FIG. 1, Schrunk also discloses that the vehicle being transported on the bed portion of a truck is “of a size” for transverse docking on the truck bed. *Id.* at FIG. 1.



Blasters-1005 at FIG. 1

131. Because Jones discloses a service truck having a bed portion rearward of the cab, it would have been obvious to transport the tractor with the attached cleaning head to the work site by loading it onto the bed portion of the truck. While the embodiment of the truck illustrated in Jones does not clearly provide a space for stowing a tractor, it would have been within the skill of a POSA to simply rearrange the objects on the truck bed or use a truck bed with a longer bed portion to accommodate the tractor. In view of Schrunk, it further would have been obvious to select the motorized utility vehicle and the cleaning head of such sizes so that they could be docked transversely on the truck bed to achieve advantages described in Schrunk: loading and unloading the tractor onto the bed portion of the truck by moving exclusively in the forward direction, thereby obviating the challenges associated with unloading the tractor in reverse. *Id.* at 1:38-48.

132. Thus, in view of Schrunk, a POSA would be motivated to select the utility vehicle and the cleaning head of such size that would enable them to be transversely docked on the bed portion of the truck in Jones. Jones expressly states that “[t]he motorized vehicle C may be *any* suitable conventional utility vehicle.” *Blasters-1002* at 3:10-11 (emphasis added). Jones, does not impose any size restrictions for the utility vehicle or the cleaning head. Thus, it would have been within the ordinary skill in the art to select the utility vehicle and the cleaning head

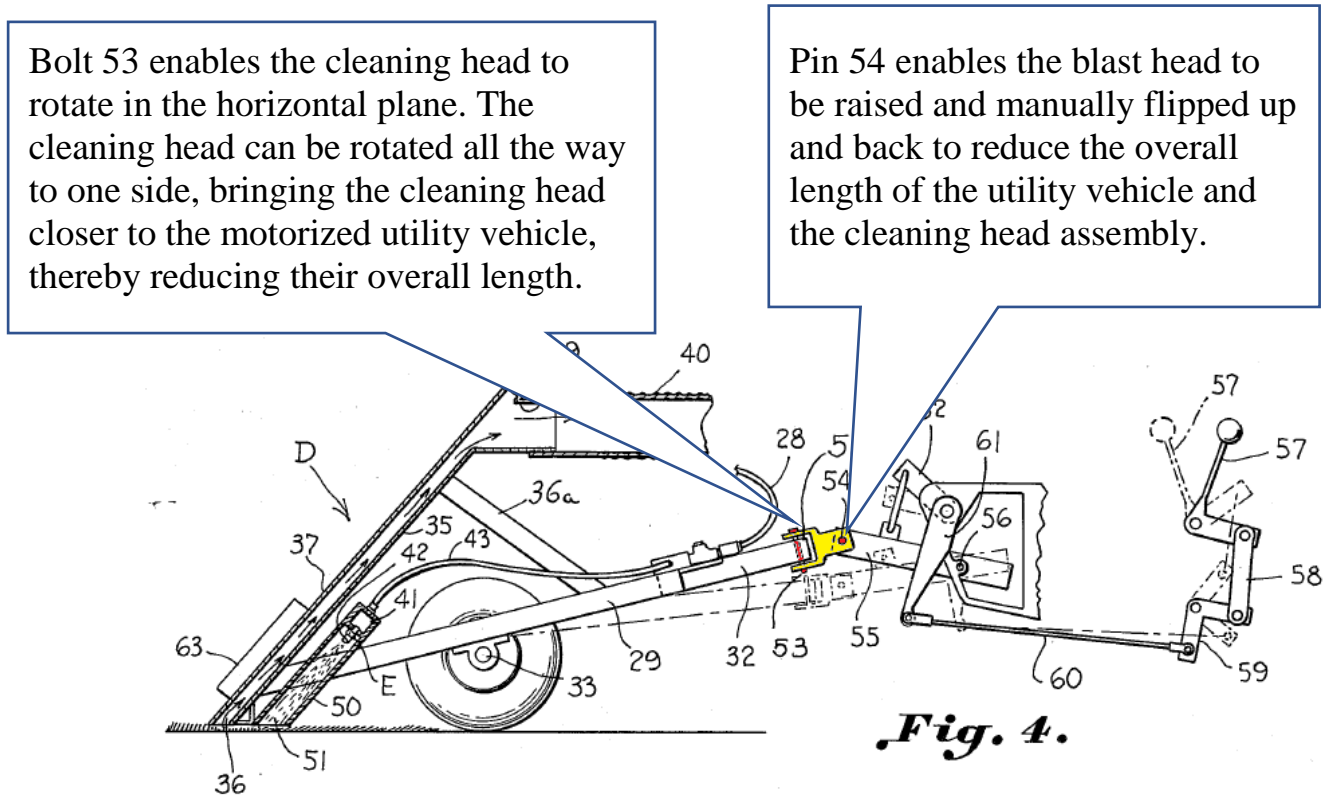
of any suitable lengths, including such lengths that would enable transverse docking on a truck bed.

- ii. Mechanical components disclosed in the ‘116 Patent for reducing the overall length of the tractor and blast head are also disclosed in Jones

133. With respect to the combined length of the tractor and blast head assembly, the ‘116 Patent recites an objective of reducing the overall combined length to under 8’6”. The ‘116 Patent discloses that this objective can be achieved by providing an articulating link that allows the blast head to rotate in both the horizontal and vertical planes. *Blasters-1001* at 2:15-18. In a disclosed embodiment of the articulating link, the overall length can be reduced “when [the blast head is] moved all the way to the right [] bring[ing] the blast head closer to the wheels of the tractor thereby reducing its overall dimension to under 8’6” when in its upright and locked position.” *Id.* at 2:41-49. The ‘116 Patent further explains that an embodiment of “the blast head 23 may be raised to a vertical position and then manually flipped up and back reducing the overall length to permit the tractor 20 and blast head 23 to be stowed on a truck bed sideways consuming a space less than 8’6” for highway travel.” *Id.* at 4:38-42. These two options are the only disclosed ways in which the overall combined length of the tractor and blast head can be reduced in length.

134. Jones likewise discloses that the cleaning head (*i.e.*, blast head) is attached to the tractor via a swivel joint 52, which enables the cleaning head to rotate

in a horizontal plane about bolt 53 and in a vertical plane about transverse pin 54. Blasters-1002 at 3:63 – 4:18, FIGS. 4-5. Jones also explains that the cleaning head has a “transporting position” in which the cleaning head is raised such that it makes no contact with the support surface. *Id.* at 4:15-16. The linkage mechanism having the swivel joint is depicted in FIG. 4, which is reproduced and annotated below with the swivel joint emphasized in yellow and bolt 53 and transverse pin 54 emphasized in red:



Blasters-1002 at FIG. 4 (annotated)

135. Pin 54 allows the cleaning head to be flipped up and back to reduce the overall combined length of the tractor and blast head. Bolt 53 allows the cleaning head to be rotated to one side to further reduce the overall combined length of the tractor and blast head. Accordingly, Jones discloses an articulating link that enables the blast head to rotate in both the vertical and horizontal planes to reduce the overall length of the utility vehicle and cleaning head assembly. There is nothing unique or novel about adjusting the location of the blast head to adjust the overall length of the tractor and blast head. A POSA would have understood that the location of the blast head could be adjusted to account for any length restrictions when the tractor and blast head assembly are stowed transversely on the bed portion of the truck.

136. Accordingly, Jones discloses the limitation of claim 5 for the following two reasons. First, claim 5 does not include any structural limitations on either the tractor or the blast head. Rather, claim 5 only requires that they be “of a size” for transversely docking on a truck bed, which is a mere design choice that is easily achievable by a POSA. After considering Schrunk, a POSA would have selected a tractor and a blast head of such sizes as to enable transverse docking on the bed portion of the support truck disclosed in Jones. Second, Jones discloses a swivel joint for connecting the cleaning head to the utility vehicle, which provides the same mechanical abilities as disclosed in the ‘116 Patent for reducing the combined length

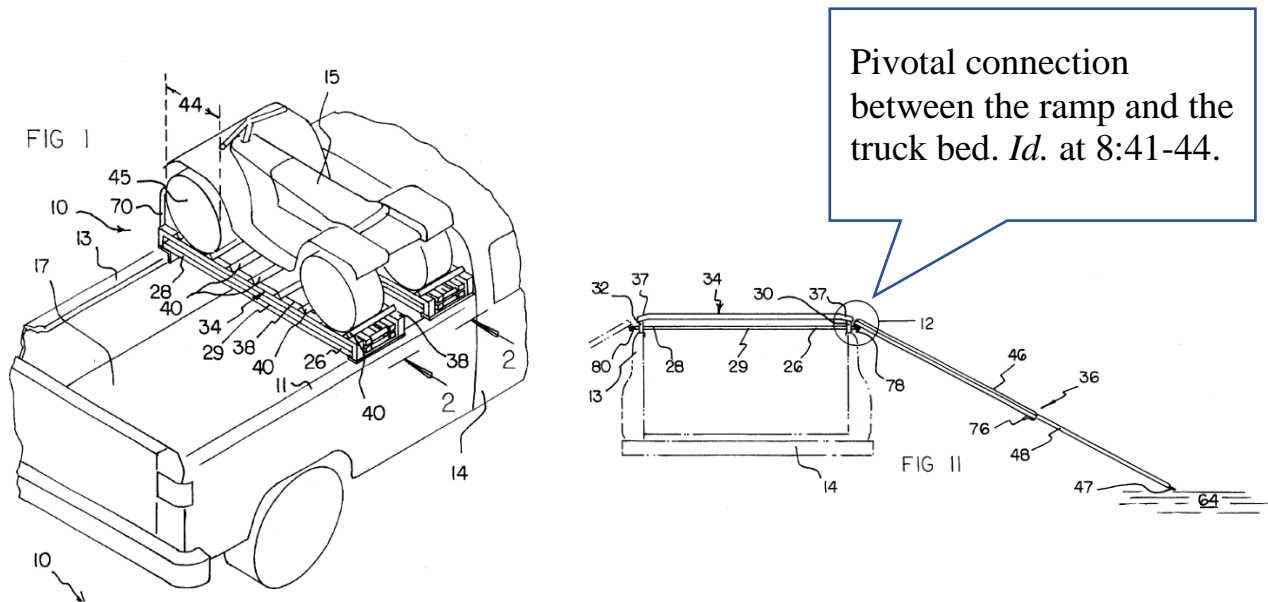
of the tractor and blast head. Therefore, Jones in view of Schrunk teaches or suggests all limitations of claim 5.

2. Claim 6

137. Claim 6 depends from claim 5 and further requires that “said bed portion includes a ramp, said ramp pivotally connected to said bed portion for raising and lowering said ramp, said ramp sized to support said tractor for docking transversely on said bed.” In my opinion, Schrunk teaches these limitations.

138. Schrunk discloses a retractable ramp pivotally connected to the bed portion of the truck. *Blasters-1005* at 7:54-56. In transitioning to a loading configuration, the ramp pivots downward and extends until it contacts the ground. *Id.* 7:56-62. Thus, Schrunk discloses the limitation “said bed portion includes a ramp, said ramp pivotally connected to said bed portion for raising and lowering said ramp.”

139. Schrunk further discloses that the utility vehicle is rolled up the ramp and transversely docked on the truck bed. *Id.* 7:62-65. Clearly, the ramp in Schrunk is intended to load and thus support a utility vehicle for docking transversely on the bed portion of the truck. Accordingly, Schrunk discloses “said ramp sized to support said tractor for docking transversely on said bed.” The transversely docked utility vehicle is depicted in FIG. 1, and the ramp is depicted in FIG. 11, both of which are reproduced and annotated below:



Blasters-1005 at FIG. 1, 6 (annotated)

140. As explained above, Schrunck teaches “said bed portion includes a ramp, said ramp pivotally connected to said bed portion for raising and lowering said ramp, said ramp sized to support said tractor for docking transversely on said bed.” It would have been obvious to a POSA to improve the bed portion of the truck disclosed in Jones, by mounting thereon the ramp disclosed in Schrunck. *See supra* ¶ 126-128. In addition, it would have been obvious to select a bed portion of the truck such that there is sufficient space for mounting the ramp and docking the tractor. *Id.* The motivation for mounting the ramp transversely is explained in Schrunck: the orientation of the ramp facilitates easier loading and unloading of the utility vehicle because the tractor can be both loaded and unloaded by moving in a forward

direction. Blasters-1005 at Abstract. Thus, Jones in view of Schrunck renders obvious “said bed portion includes a ramp, said ramp pivotally connected to said bed portion for raising and lowering said ramp, said ramp sized to support said tractor for docking transversely on said bed.”

D. Grounds 4: Claims 1-4 are obvious based on Clemons in view of NLB

141. In my opinion, claims 1-4 of the ‘116 Patent are obvious based on Clemons in view of NLB.

1. Overview of the combination of Clemons and NLB Brochure

142. Clemons and NLB are from the same field of endeavor—water jet cleaning—and use generally the same components. Both disclose a complete cleaning system adapted to be operated by a single operator. Moreover, both systems employ pressurized water to separate coatings from a hard surface and a vacuum recovery system to retrieve the discharged liquid and resulting debris. *See* Blasters-1008 at Abstract, 1:60-63; Blasters-1006 at pg. 2.

143. The cleaning system in Clemons is essentially a large cleaning truck carrying all of the common components for a typical cleaning systems. This vehicle, however, suffers from a long turning radius typical of larger vehicles and an inability to efficiently clean areas with limited access. NLB specifically discloses a self-contained system employing a tractor to address areas with limited access and/or

areas that would be more easily cleaned with a vehicle having a shortened turning radius, such as parking lots, garages, and intersections. Blasters-1006 at pg. 2 and 5. Moreover, the NLB StripeJet™ undoubtedly includes a blast head fluidly coupled to a high pressure pump to achieve the stated 40,000 psi water pressure and also a vacuum hose extending from the blast head to the vacuum tank and the vacuum pump. These connections are required to create the complete and operable system disclosed in NLB.

144. Therefore, a POSA would have understood that the disclosed cleaning system in Clemons would benefit from a secondary utility vehicle, such as the StripeJet™ tractor disclosed in NLB. The tractor would have been beneficial for cleaning areas with limited access and/or areas that require a vehicle with a tight turning radius. A POSA would have further understood that the tractor could be transported on the bed portion of the truck in Clemons to maintain the objective of a self-contained system operated by a single operator. Although the truck illustrated in Clemons does not appear to have room for a tractor to be stowed on the bed portion of the truck, a POSA would have understood that the components on the bed portion of the truck in Clemons could have been re-arranged to make additional room or a larger truck could have been used. There is nothing difficult about such a modification and it is well within the skill of a POSA to make such a modification.

145. Moreover, it is well within the skill of a POSA to adjust the connections of high pressure water hoses and vacuum hoses. There is nothing difficult about connecting and disconnecting the high-pressure water hoses and vacuum tubing between the truck's blast head and the tractor's blast head as needed when transitioning between the use of the truck's blast head and the tractor's blast head.

146. Accordingly, a POSA would have been motivated to modify the Clemons device to include a compact vehicle, which can be transported on the bed portion of the primary cleaning vehicle and then unloaded and employed to clean areas having limited access or areas requiring a vehicle with a tighter turning radius. Furthermore, the various components on each cleaning system are conventional and easily transferable between systems. Thus, a POSA would have had a reasonable expectation of success in modifying the Clemons cleaning system to include a compact utility vehicle for use in areas having limited access.

147. Furthermore, it would have been obvious to further improve the cleaning system of Clemons in view of NLB by replacing the vacuum pump, water pump, water supply hose, and spray nozzles of Clemons with the high-power, 1,000 CFM vacuum pump, water pump, water supply hose, and spray nozzles of NLB, which are specifically designed to operate with "ultra-high pressure water" of up to 40,000 psi. *Blasters-1006* at 2, 4. This modification would create a system having a

greater level of applicability in cleaning various surfaces and removing various coatings.

2. Claim 1

a. A cleaning system for removing coatings from a hard surface by high pressure liquid comprising

148. In my opinion, Clemons in view of NLB discloses “a cleaning system for removing coatings from a hard surface by high pressure liquid.” Clemons explains that the disclosed cleaning system is configured to remove foreign matter residing on a surface (*i.e.*, coatings) from “a surface 100 *over which it can be driven*. Such surfaces include, but are not limited to, runways, streets, sidewalks, parking surfaces, decks of ships and industrial floor areas.” *See* Blasters-1008 at 2:64-3:4 *see also* Abstract, 1:54-59.

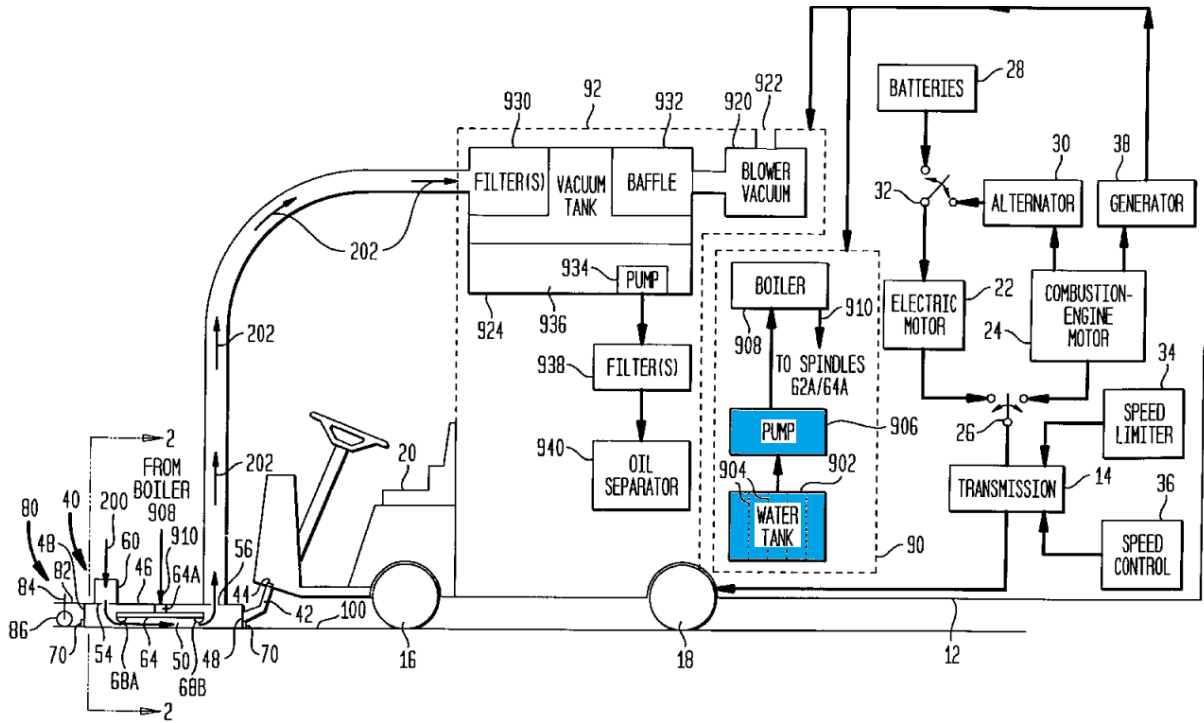
149. Under BRI, both Clemons and NLB disclose a system using high pressure liquid. Clemons tested an embodiment of the cleaning system on an undisclosed surface to remove undisclosed coatings, and that the best results were achieved when the discharged water had a temperature of 150° Fahrenheit and a pressure of approximately 4,000 psi. *Id.* at 6:12-17. The tested pressure of 4,000 psi is substantially above atmospheric pressure and is therefore “high pressure” as used in the claims.

150. Moreover, a POSA would have understood that the water temperature and water pressure can be varied based on the surface to be cleaned and the type of coatings to be removed. In other words, these properties are simply a design choice based on a particular job. For example, NLB, indicates that the disclosed cleaning system can remove pavement markings with water at an ambient temperature and a pressure of 40,000 psi. *See* Blasters-1006 at pg. 2. Pressurizing water to a specific pressure is simply a matter of the capabilities of the water pump and the settings of the pump as controlled by the user. There is nothing unique or difficult in exchanging one pump for a more powerful pump and a POSA would have been motivated to use the most powerful pump available, and then simply adjust the pump to produce water at a desired pressure based on the particular job. The result is a more versatile and efficient cleaning system, which is an implicit motivation to combine the NLB water pump with the Clemons system. Thus, even if the term “high pressure” is construed to the exemplary quantitative values in the specification of the ‘116 Patent of 25,000-40,000 psi, the combination of Clemons and NLB discloses said limitation.

b. in combination a liquid reservoir connected to a high pressure pump.

151. In my opinion, Clemons discloses the limitation “in combination a liquid reservoir connected to a high pressure pump.” As depicted below in annotated FIG. 1 of Clemons, the cleaning system includes in combination a liquid reservoir

(emphasized in blue) connected to high-pressure pump (emphasized in blue).
Blasters-1008 at 4:57-58. Therefore, Clemons discloses “in combination a liquid reservoir connected to a high pressure pump.”

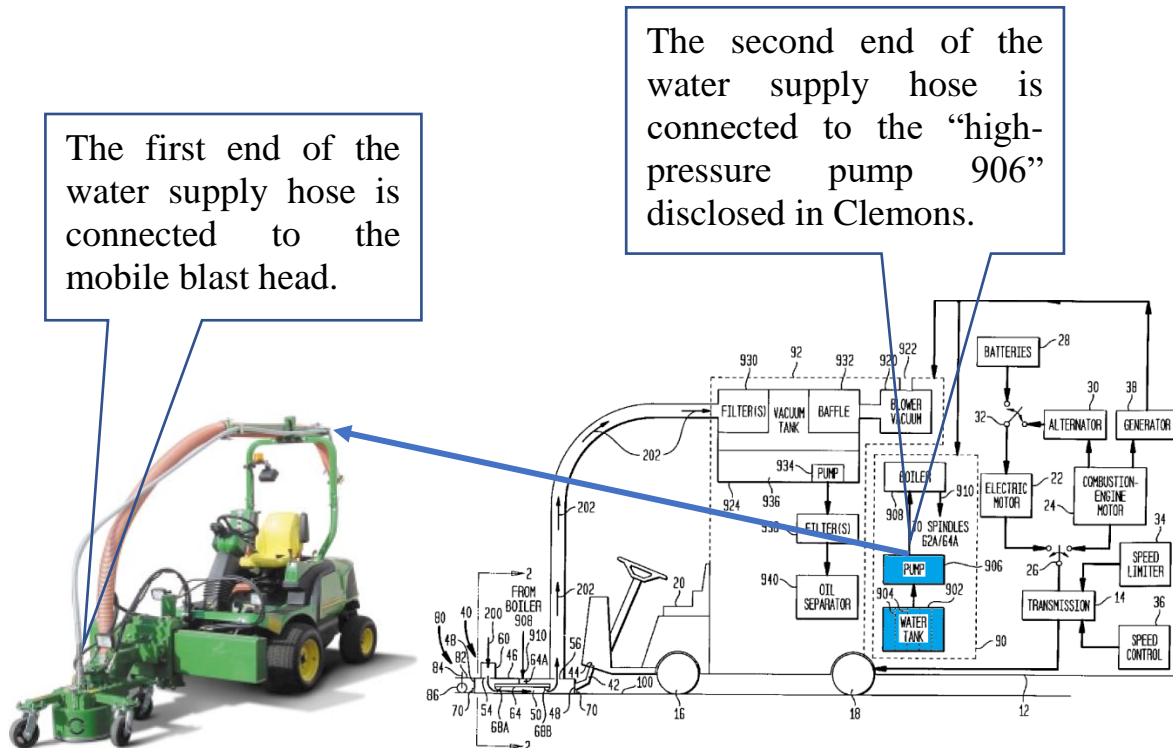


Blasters-1008, FIG. 1 (annotations in color)

152. As noted in paragraph 147, a POSA would have been motivated to modify Clemons to include the NLB water pump, which is a high pressure pump. The modification, however, would not have altered the connection between the water tank and the high pressure pump. Accordingly, Clemons in view of NLB also discloses the limitation “in combination a liquid reservoir connected to a high pressure pump.”

- c. said pump connected to a mobile blast head by a high pressure hose,

153. In my opinion, Clemons in view of NLB discloses the limitation “said pump connected to a mobile blast head by a high pressure hose.” As previously explained, it would have been obvious to combine Clemons with the StripeJet™ system disclosed in NLB to provide a “compact and maneuverable” vehicle, thereby achieving a cleaning system suitable for “areas with limited access (*e.g.*, parking lots, garages, intersections).” *Blasters-1006* at 4, 5. In the combination of NLB and Clemons, the blast head on the tractor is connected to the pump via the high pressure hose depicted in NLB. The configuration is depicted below:



Blasters-1006 at 4; *Blasters-1008* at FIG. 1 (annotated)

154. As noted in paragraph 147, it would have been obvious to further improve the cleaning system of Clemons by replacing the high-pressure pump 906 with an “ultra-high pressure” pump of NLB which is designed to achieve pressures of up to 40,000 psi. While Clemons does disclose a boiler intermediately located between the high pressure pump and the blast head, *see id.* at 4:57-5:1, the pressurized water is still delivered from the high pressure pump to the blast head. In other words, the high pressure pump is indirectly linked or joined (*i.e.*, connected to) the cleaning head. In addition, a POSA would have understood that the intermediate boiler could be removed from the cleaning system and a single hose could have been used to transport pressurized water from the pump to the cleaning head to create a simpler and less expensive system. NLB does not require the water to be heated as 40,000 psi water pressure is sufficient for its intended purpose of “remov[ing] pavement markings faster and more thoroughly” *Blasters-1006* at 2. The resulting cleaning system includes the Clemons’ truck carrying the high pressure pump with the high pressure hose of NLB extending from the blast head and connecting directly to the pump. Such a modification is well within the skill of a POSA. Accordingly, Clemons in view of NLB discloses the limitation “said pump connected to a mobile blast head by a high pressure hose.”

- d. said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface.

155. Both Clemons and NLB disclose a blast head having a plurality of nozzles. Clemons discloses a plurality of nozzles residing within a cleaning volume. Blasters-1008 at Abstract. The cleaning volume is defined by a skirt extending downward from an upper deck on the cleaning head. *Id.* Clemons further explains that the nozzles are fluidly coupled to the high pressure pump and discharge pressurized water onto the surface being cleaned. *See id.* at 2:22-30, 3:66-4:9. Thus, Clemons discloses “said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface.”

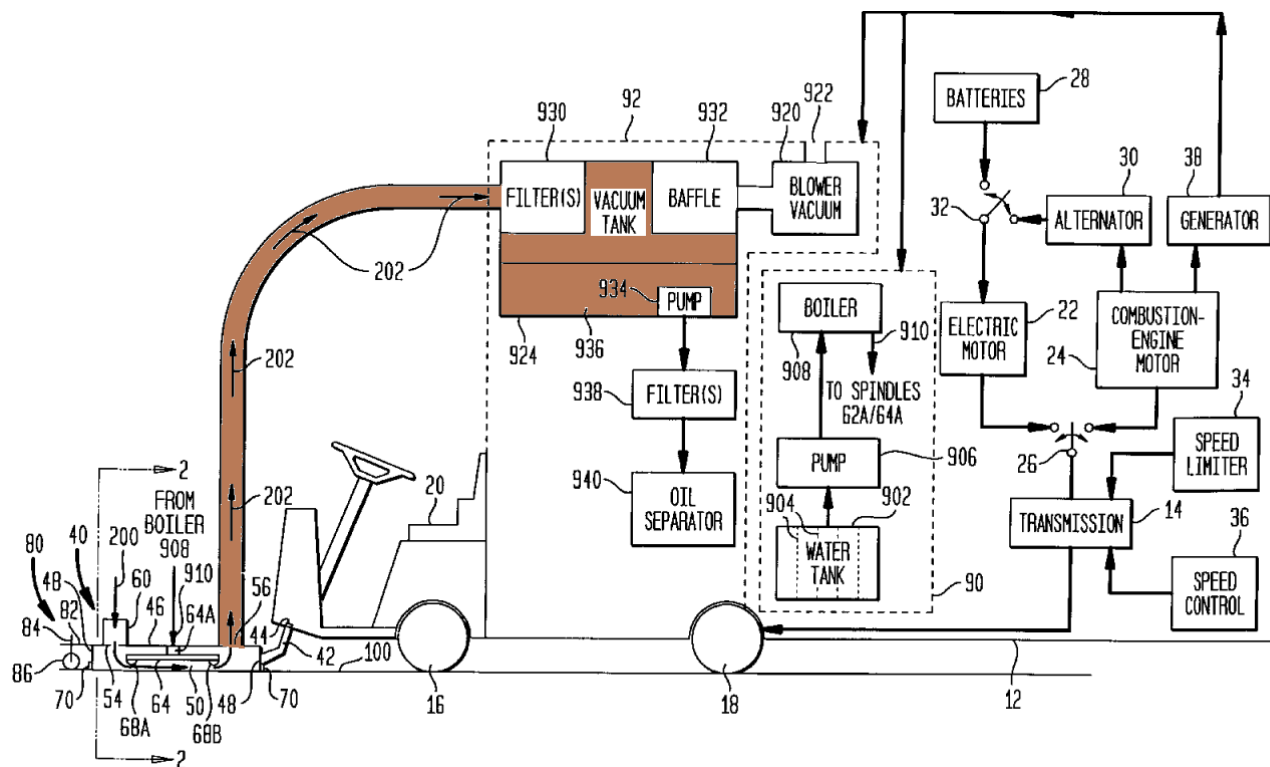
156. NLB discloses a blast head having up to 16 nozzles for delivering ultra-high pressure water (40,000 psi) onto a hard surface, such as concrete. Blasters-1006 at 2, 4. The combination of NLB and Clemons discloses the limitation “said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface.”

- e. a waste removal hose connected at one end to said blast head and at the other end to a sump for collection of liquid and coating,

157. In my opinion, the combination of Clemons and NLB discloses the limitation “a waste removal hose connected at one end to said blast head and at the other end to a sump for collection of liquid and coating.” As provide in annotated FIG. 1 below, a waste removal hose (emphasized in brown) is connected at one end

to the blast head and at the other end to a sump for collection of liquid and debris.

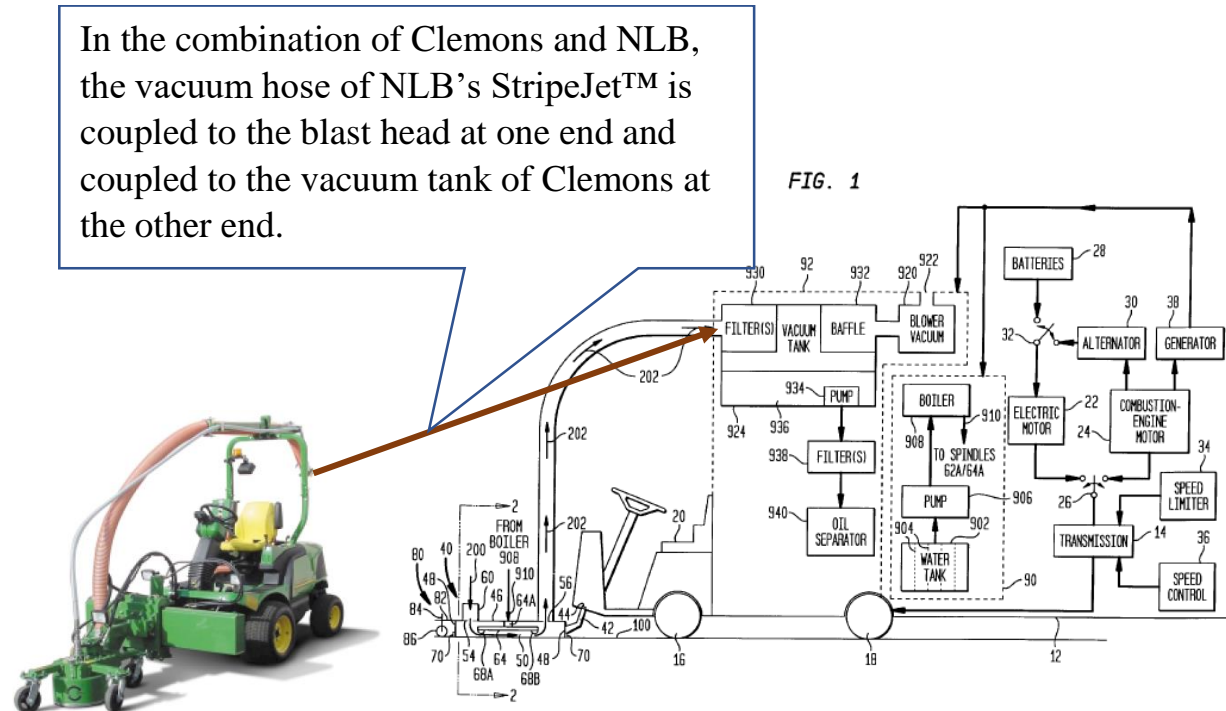
See id. at 2:19-22, 4:45-47, 6:6-11.



Blasters-1008, FIG. 1 (annotations in color)

158. As explained in the claim construction section, a sump is a reservoir serving as a receptacle for liquid and substances removed from a surface. The vacuum tank in Clemons collects both liquid and debris, and is therefore a sump. Clemons further explains that the vacuum tank includes a “sump pump” “mounted in the lower (fluid-liquid) portion of vacuum tank 924.” *Id.* at 5:12-13. A POSA would understand that the vacuum tank in Clemons is equivalent to a sump as recited in the claim.

159. As depicted below, the combination of Clemons and NLB results in the free end of the waste removal hose in NLB connecting to the sump in Clemons to create a complete and operable system.



Blasters-1006 at 4; Blasters-1008 at FIG. 1 (annotated)

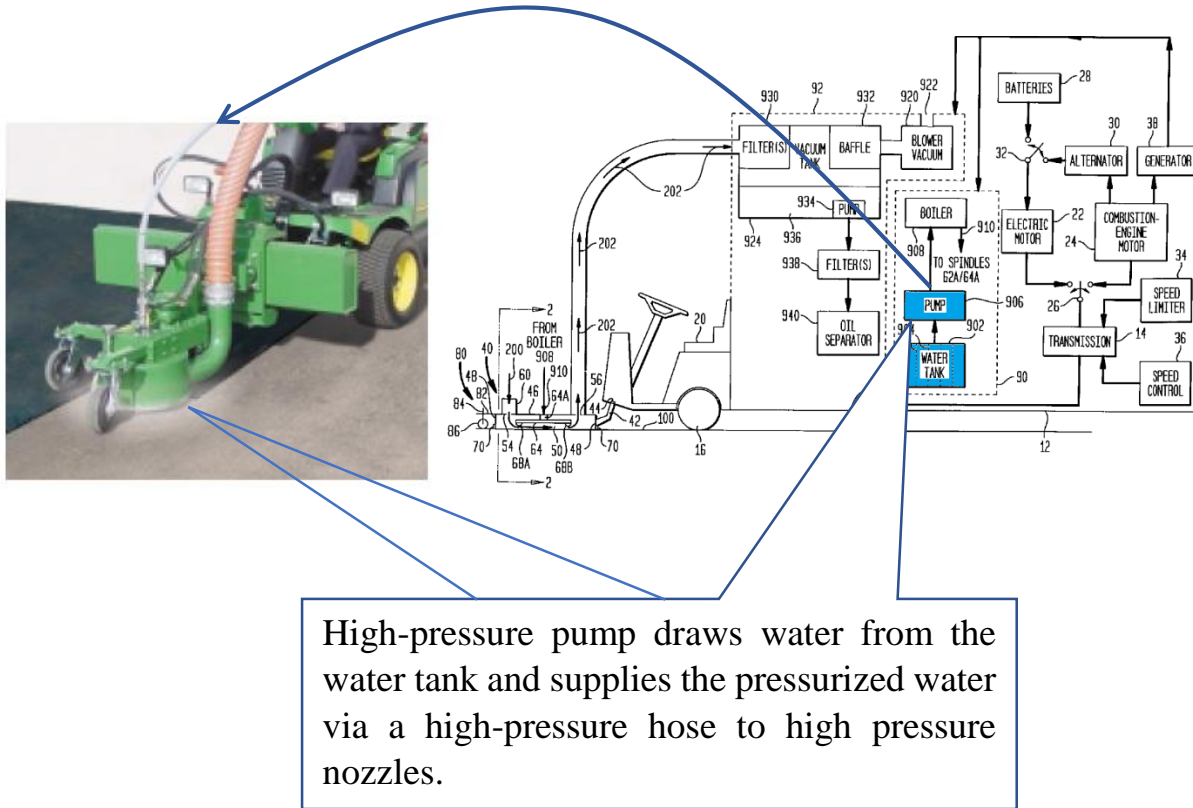
160. Therefore, Clemons in combination with NLB discloses “a waste removal hose connected at one end to said blast head and at the other end to a sump for collection of liquid and coating.”

f. said sump connected to said liquid reservoir,

161. In my opinion, Clemons discloses “said sump connected to said liquid reservoir.” Clemons discloses a recirculation process in which the sump pump in the vacuum tank pumps the recovered liquid and debris through a series of filters to produce clean water. *See id.* at 5:12-20. The clean water is returned to the liquid supply tank for reuse. *Id.* Thus, the sump in Clemons is connected to the liquid reservoir. Accordingly, Clemons discloses the limitation “said sump connected to said liquid reservoir.”

- g. whereby liquid is pumped through said high pressure hose from said reservoir and exits said high pressure nozzle onto the hard surface for removing coatings therefrom.

162. As previously explained, Clemons pumps pressurized liquid from the liquid reservoir 902 to nozzles 66A/66B, and said pressurized liquid exits the high pressure nozzles onto a hard surface, such as an airport runway, street, or parking surface, to remove coatings from the surface. *See id.* at 4:65-5:3, 3:2-4, 5:58-59. As explained in paragraphs 151-56, in the combination of Clemons and NLB, high-pressure pump 906 draws water from water tank 902 and supplies pressurized water via the high pressure hose to the “up to 16 nozzles” disposed within the blast head of the StripeJet™ and which direct a water jet onto a concrete surface for “[f]loor coating removal.” *Blasters-1006* at 2, 4. The combination is depicted below:



Blasters-1006 at 4 (annotated)

163. Thus, Clemons in combination with NLB, discloses “whereby liquid is pumped through said high pressure hose from said reservoir and exits said high pressure nozzle onto the hard surface for removing coatings therefrom.”

- h. said liquid and coatings conveyed through said waste removal hose to said sump via a high power vacuum pump.

164. In my opinion, Clemons in combination with NLB discloses the limitation “said liquid and coatings conveyed through said waste removal hose to

said sump via a high power vacuum pump.” Clemons discloses a vacuum system having a blower-type vacuum, which a POSA would have understood to be a vacuum pump that creates the vacuum force. *Id.* at 5:4-6, FIG. 1. Clemons explains that the “vacuum force created by vacuum/recycling system 92 is applied through hose 942” and “[t]he resulting mixture 202 of water and loosened debris/contaminants is drawn into hose 942 and delivered to vacuum tank 924.” *Id.* at 5:59-61, 6:10-12. Furthermore, as explained in paragraph 180, a POSA would have been motivated to exchange the vacuum pump in Clemons for the high power vacuum pump disclosed in NLB. Accordingly, Clemons in combination with NLB discloses the limitation “said liquid and coatings conveyed through said waste removal hose to said sump via a high power vacuum pump.”

i. said coatings collected in said sump,

165. Clemons also discloses filter 930 disposed within sump 924, which filters and *traps* larger solid particles (*i.e.*, coatings) within said sump. *See id.* at 5:10-11, 6:19-20, FIG. 1. Thus, it is my opinion that Clemons discloses “said coatings collected in said sump.”

j. said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame,

166. In my opinion, Clemons discloses the limitation “said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame.”

As explained in the claim construction section, the term “mobile frame” should be construed to mean “a structural component configured to support objects placed thereon.” FIG. 1 of Clemons depicts the liquid reservoir, sump, and high pressure vacuum pump mounted on frame 12 of the surface cleaning vehicle. *See also* Blasters-1008 at 4:45-52. Clemons further discloses that frame 12 is coupled to both the front and rear wheels of the truck, thus clarifying that frame 12 is mobile and an integral part of the truck. Accordingly, Clemons discloses “said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame.”

167. If the term “mobile frame” is construed as requiring the frame to be movable with respect to the truck, this limitation is still obvious. As explained in paragraph 56, Sloan discloses a truck having a sump mounted onto a “tiltable dump body,” which aids in discharging material from the sump. Blasters-1007 at Abstract; FIG. 1. A POSA would have understood that Clemons could have been improved by modifying the truck to include a tiltable dump body to aid in discharging material from the sump. This modification would result in a POSA rearranging the sump to a rear section of the truck, but a simple rearrangement of the components on the truck is well within the skill of a POSA. Such modification would have been straightforward, would not require undue experimentation, and would produce predictable results.

- k. said mobile frame forming an integral part of a truck having a bed portion and a cab portion,

168. In my opinion, Clemons also discloses the limitation “said mobile frame forming an integral part of a truck having a bed portion and a cab portion.” FIG. 1 of Clemons depicts a truck 10, which is referred to as surface cleaner 10. “Surface cleaner 10 includes a self-propelled vehicle having a frame 12, a drive train coupled to frame 12 that includes a transmission 14 coupled to rear wheels 18 (as shown) and/or front wheels 16.” *Blasters-1008* at 3:5-8. Therefore, frame 12 is an integral part of the truck in Clemons.

169. Clemons further discloses “a driver/operator compartment 20 at the front portion of the vehicle,” which is equivalent to a cab portion of a truck. *See id.* at 3:5-11. Thus, Clemons discloses the truck having a cab portion.

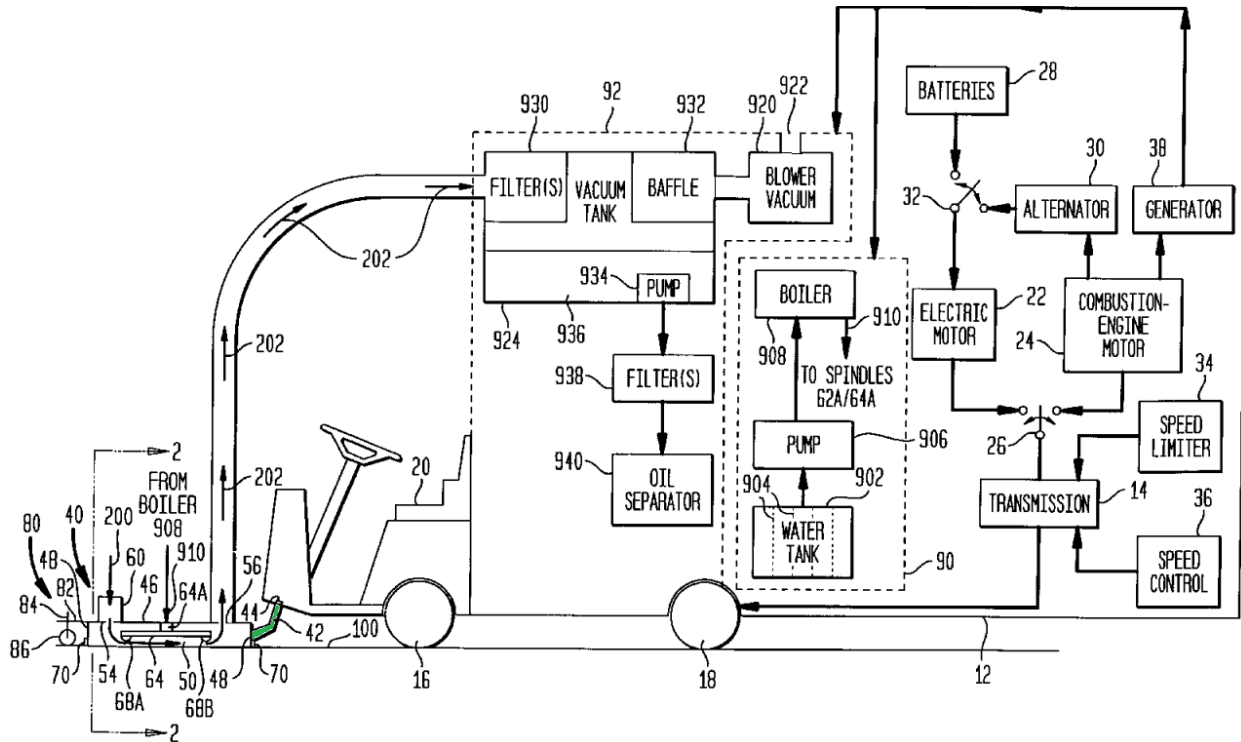
170. A bed portion of a truck is the rearward support structure of a truck. The portion of the truck in Clemons that is rearward of the cab portion includes a platform structure supporting the liquid delivery system and vacuum/recycling system mounted thereon. Accordingly, Clemons discloses the limitation “said mobile frame forming an integral part of a truck having a bed portion and a cab portion.”

- l. said truck being self-propelled,

171. Clemons discloses that the surface cleaner is self-propelled. *See e.g. id.* at Abstract, 2:11-13.

- m. said mobile blast head being mounted at a distal end of an articulating link, a proximal end of said articulating link secured to a tractor

172. In my opinion, the combination of Clemons and NLB discloses the limitation “said mobile blast head being mounted at a distal end of an articulating link, a proximal end of said articulating link secured to a tractor.” As explained in the claim construction section, “articulating link” is understood to mean “a connecting structure that connects two parts in such a way as to permit relative movement.” As depicted below in annotated FIG. 1 and described in the specification, Clemons discloses a blast head mounted at a distal end of an arm (emphasized in green). The arm is adapted to permit relative movement of the blast head with respect to the vehicle. *See id.* at 3:36-41 (“an arm 42 pivotally attached to frame 12 at pivot point 44. Arm 42 can be manually pivoted or pivoted via a motorized force to raise/lower cleaning head 40 and set a forward-to-rear pitch angle of cleaning head 40 relative to surface 100.”). Thus, Clemons discloses the limitation “said mobile blast head being mounted at a distal end of an articulating link.”



Blasters-1008, Figure 1 (annotations in color)

173. As explained in paragraphs 142-146, a POSA would have been motivated to modify the Clemons cleaning system to include a compact vehicle, such as a tractor, to create a more efficient system that can address areas with limited access. When combining Clemons with NLB, it would have been obvious to connect the blast head of NLB to the tractor of NLB using pivotal arm 42 of Clemons to enable the blast head to adjust the forward-to-rear pitch angle according to the teachings of Clemons. This modification would have been straightforward and would have produced predictable results. Accordingly, the combination of Clemons

and NLB discloses “said mobile blast head being mounted at a distal end of an articulating link, a proximal end of said articulating link secured to a tractor.”

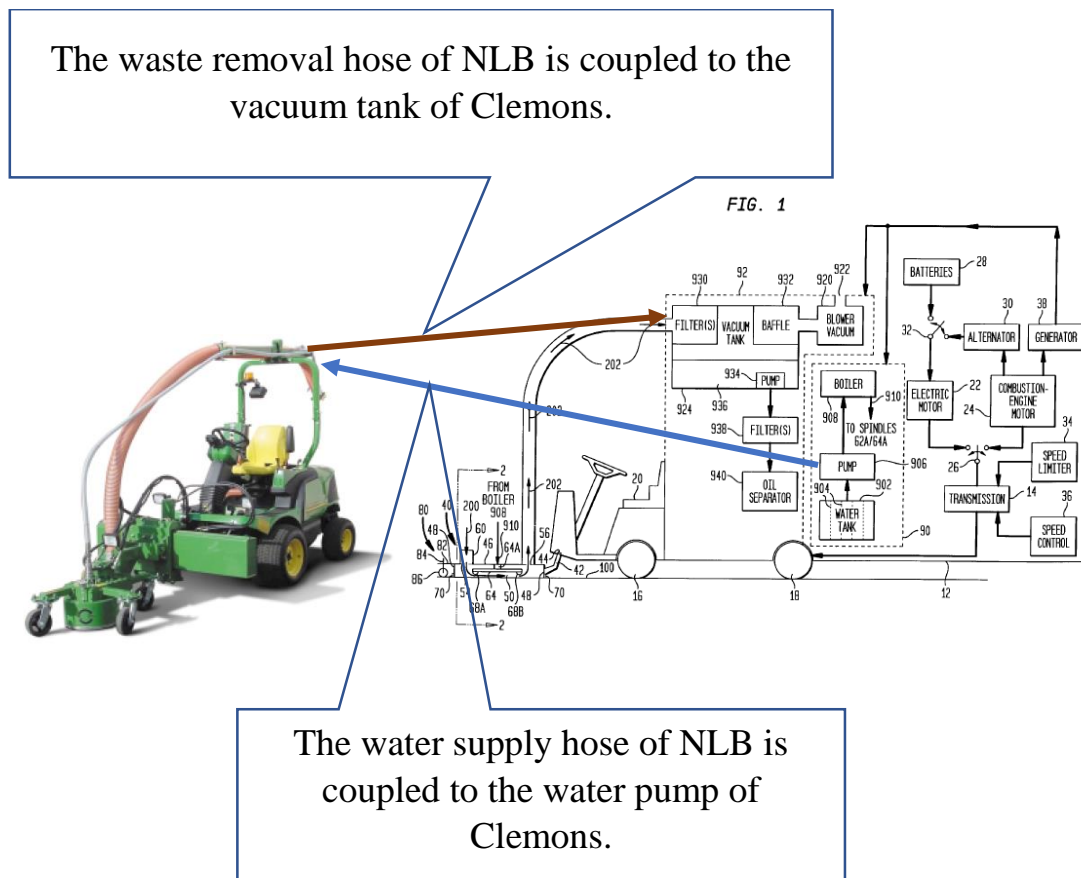
n. said tractor including an engine for propulsion thereof,

174. Clemons in view of NLB discloses that the tractor includes an engine for propulsion. Blasters-1006 at pg. 4. NLB explains that the StripeJet™ tractor has a 24 hp diesel engine and provides values for the tractor’s speed and fuel tank capacity. *Id.* Accordingly, a POSA would have understood that the NLB tractor has an engine for propulsion.

o. wherein said high pressure hose and said waste removal hose extend between said truck and said tractor

175. In my opinion, Clemons in view of NLB discloses the limitation “wherein said high pressure hose and said waste removal hose extend between said truck and said tractor.” NLB divulges that the StripeJet™ system is a “complete system[] with a patented rotating nozzle assembly, an ULTRACLEAN 40® pump unit, water tank, and optional vacuum recovery to contain water and debris.” *Id.* at pg. 2. Therefore, a POSA would have understood that the free ends of the vacuum hose and high pressure water hose shown above in the annotated FIGS. of NLB are intended to fluidly connect to the water pump and the vacuum pump, respectively, to create an operable system. In combining the tractor in NLB with the cleaning system in Clemons, a POSA would have undoubtedly understood that the blast head

is to be connected to the vacuum and water pumps via the vacuum hose and the high pressure water hose, respectively, to create a working system. Moreover, both the high pressure water pump and the vacuum pump in Clemons are mounted on the truck. Thus, when the tractor is combined with Clemons, both the vacuum hose and the high pressure water hose extend between the tractor having the blast head and the truck having the respective pumps as depicted below:



Blasters-1006 at 4; Blasters-1008 at FIG. 1 (annotated)

176. Accordingly, the combination of Clemons and NLB discloses “wherein said high pressure hose and said waste removal hose extend between said truck and said tractor.”

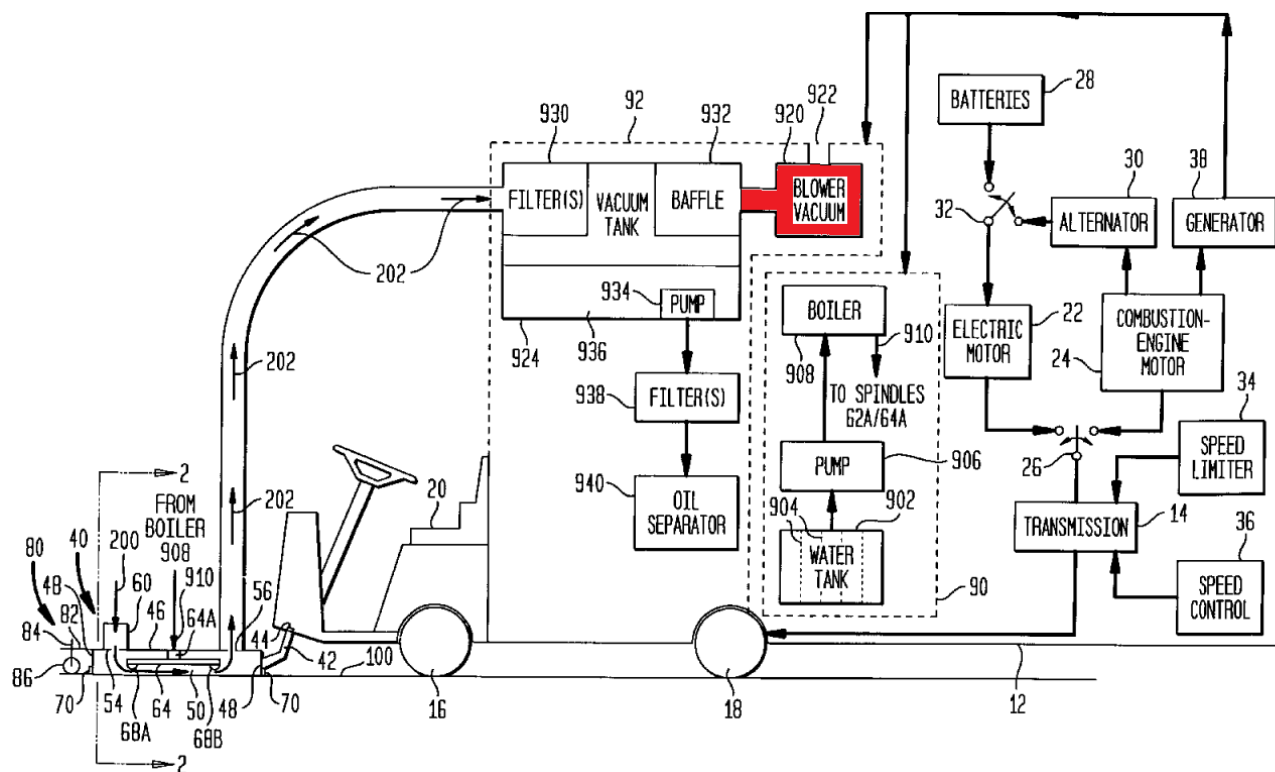
p. whereby said tractor is utilized to maneuver said blast head.

177. NLB clearly depicts the blast head secured to the tractor. Blast-1006 at pg. 1, 4, 5. Accordingly, a POSA would have understood that the tractor is utilized to maneuver the blast head.

178. Accordingly, Clemons and NLB in combination disclose every limitation in claim 1 of the ‘116 Patent.

3. Claim 2

179. Dependent claim 2 requires that “a high power vacuum pump is connected to said sump.” In my opinion, Clemons in view of NLB discloses the limitation “a high power vacuum pump is connected to said sump.” As depicted below in annotated FIG. 1 and as provided in the specification, Clemons discloses a blower vacuum (emphasized in red) connected to vacuum tank 924. Blast-1008 at FIG. 1, 5:4-6. Therefore, Clemons discloses all the limitations of claim 2.



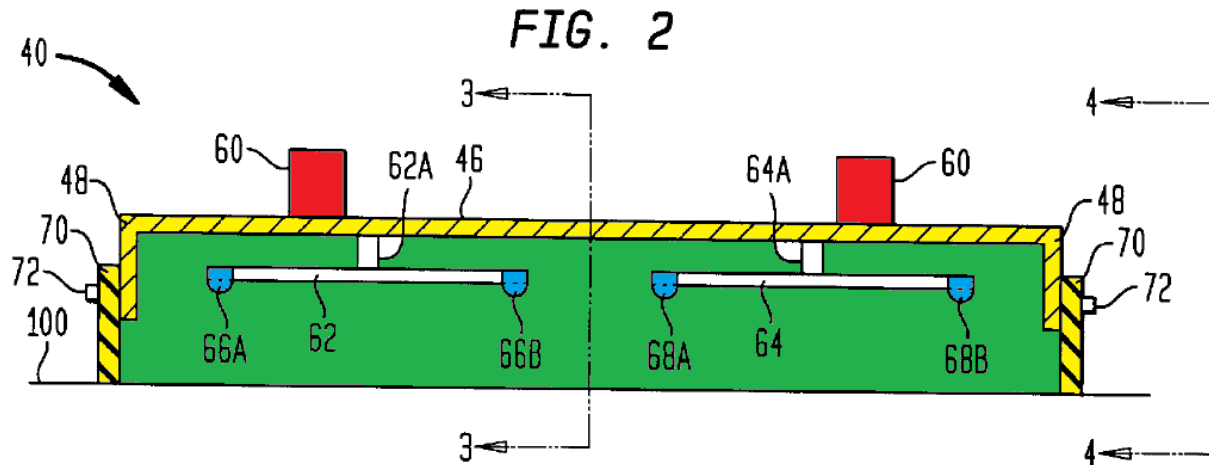
Blasters-1008, FIG. 1 (annotations in color)

180. Even if the term “high power” is construed to mean approximately 1,100 cfm based on the single exemplary embodiment in the ‘116 Patent, NLB discloses a vacuum pump capable of producing a vacuum force of 1,000 cfm, which is approximately 1,100 cfm. *See* Blasters-1006 at pg. 4. A POSA would have been motivated to exchange the vacuum pump in Clemons for the more powerful vacuum pump in NLB because a more powerful vacuum pump will more efficiently retrieve spent liquid and debris. Accordingly, Clemons in view of NLB discloses the limitation “a high power vacuum pump is connected to said sump” regardless of the construction of the term “high power.”

4. Claim 3

181. Dependent claim 3 requires that “a shroud is connected to said blast head, said shroud surrounds said at least one nozzle and forms a negative pressure chamber.” As shown in the NLB images, the StripeJet™ has a blast head with a shroud. *See* Blasters-1006 at pg. 1, 4, and 5. Accordingly, a shroud connected to a blast head was a well-known component in the industry and disclosed by NLB.

182. Clemons also discloses a skirt on the cleaning head that extends downwards towards the surface to be cleaned to create a cleaning volume. *See* Blasters-1008 at 3:41-50. A shroud is defined as “something that covers, screens, or guards.” *See* Blasters-1012 at pg. 5. Thus, the skirt in Clemons is a shroud. Clemons also clarifies that “[a] plurality of nozzles are [sic] mounted for movement within the cleaning volume,” or *i.e.*, the shroud surrounds the nozzles. *See id.* at 2:22-23. The arrangement is depicted below in FIG. 2 of Clemons with the skirt (*i.e.*, shroud) emphasized in yellow, nozzles emphasized in blue, and the vacuum pump coupled to ducts 60 emphasized in red, and the negative pressure chamber emphasized in green within the cleaning volume encompassed by the skirt.



Blasters-1008 at FIG. 2 (annotated)

183. A negative pressure chamber is a space having a pressure less than the atmospheric pressure. As a result, external fluids are forced into the negative pressure chamber by the greater atmospheric pressure, which causes a suction/vacuum force. Clemons operates in the same fashion. The vacuum system in Clemons is coupled to the cleaning volume, defined by the skirt (*i.e.*, shroud), and the vacuum system creates a suction/vacuum force (*i.e.*, a negative pressure) in the cleaning volume. *See* Blasters-1008 at 5:59-62. The cleaning volume is defined by the shroud. Therefore, the shroud in Clemons forms a negative pressure chamber in the same manner as the system disclosed in the '116 Patent.

184. In so far as NLB does not expressly disclose a shroud, it would have been obvious to dispose the shroud disclosed in Clemons around the blast head of NLB, such that the nozzles and the vacuum inlet are enclosed within the shroud. A

POSA would have been motivated to modify NLB accordingly, because Clemons explains that the shroud “prevent[s] water sprayed into cleaning volume 50 from escaping therefrom.” *Blasters-1008* at 5:61-64. One of the objects of the NLB and Clemons combination is to retrieve spent liquid and a shroud would aid in this objective. Accordingly, all the limitations of claim 3 were disclosed in the combination of Clemons and NLB.

5. Claim 4

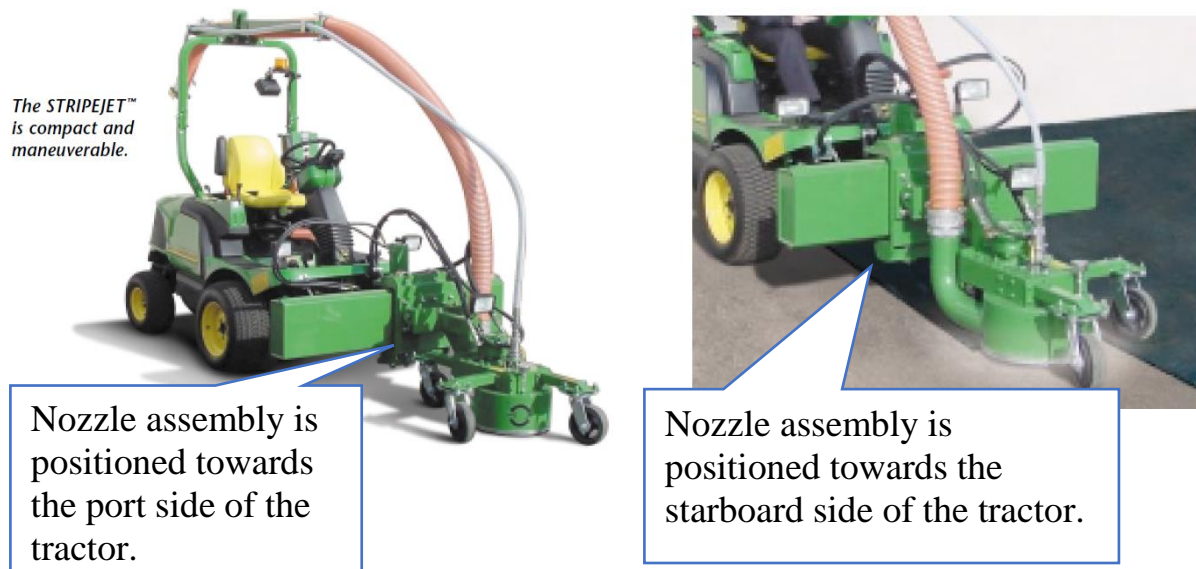
185. Dependent claim 4 requires that “said mobile blast head is attached to a wheeled chassis for maneuvering over the hard surface.” In my opinion, both Clemons and NLB disclose this limitation. A wheeled chassis is simply a support frame having wheels and a blast head is a mechanical component having at least one nozzle. Both NLB and Clemons depict their respective blast heads attached to a support frame having wheels. *See Blasters-1008* at FIG. 1; *Blasters-1006* at pg. 1, 4, and 5. Clemons also explains that “[a]ttached to the forward end of cleaning head 40 are a plurality of spaced-apart wheel assemblies [that] support-cleaning head 40.” *See Blasters-1008* at 4:35-38. Accordingly, both NLB and Clemons disclose the limitations of dependent claim 4.

6. Claim 10

186. Dependent claim 10 includes the limitation “said articulating link is constructed and arranged for controlled movement in a horizontal and a vertical

plane.” In my opinion, NLB discloses this limitation. The claim lacks any explanation as to how the articulating link is constructed and arranged to achieve controlled movement. Therefore, a POSA would have understood that any construction and arrangement is covered so long as the articulating link can be moved in both a horizontal and vertical plane. As previously explained in paragraphs 172-73, a POSA would have been motivated to connect the blast head in NLB to the tractor using the pivoting arm 42 (*i.e.*, articulating link) disclosed in Clemons that “can be manually pivoted or pivoted via a motorized force to raise/lower cleaning head 40.” *Blasters-1008* at 3:38-41. Therefore, the combination of Clemons and NLB discloses an articulating link designed for controlled movement in the vertical plane.

187. With respect to movement in the horizontal plane, the images of the StripeJet™ on page 4 of NLB (reproduced below) show the nozzle assembly positioned at two separate locations along a horizontal support member, which suggests that the structural link is constructed and arranged for controlled movement in a horizontal plane.



Blasters-1006 at pg. 4. (annotated)

188. The image on the left shows the nozzle assembly positioned closer to the port side of the tractor and the image on the right shows the nozzle assembly positioned closer to the starboard side of the tractor. Thus, the nozzle assembly is constructed and arranged for controlled movement in a horizontal plane. Modifying the articulating link in NLB to include controlled movement in a vertical direction could have been accomplished without compromising the ability of the articulating link to translate in a horizontal direction as taught in NLB. Such a modification would have been well within the skill of a POSA.

189. Accordingly, Clemons in combination with NLB discloses all the limitations of claim 10.

E. Ground 5: Claims 5-6 are obvious based on Clemons in view of NLB and in further view of Schrunk

190. As explained in Ground 4, Clemons in view of NLB discloses all of the limitations of claims 1-4 of the '116 Patent. In my opinion, Clemons in view of NLB and Schrunk discloses all the limitations of claim 5 and 6.

191. As established in paragraph 51, *supra*, Schrunk first discloses that compact vehicles are can be transported by other vehicles. Schrunk also discloses advantages to transporting a compact vehicle, such as a tractor, transversely on the bed portion of a truck. *See* Blasters-1005 at 1:50-60, 4:32-25. A POSA would have understood the advantages of transversely loading and docking a tractor as described in Schrunk. Moreover, as previously explained in paragraphs 143-46, *supra*, a POSA would have understood the advantages of modifying the Clemons system to include a compact tractor based on the teachings of NLB: providing a cumbersome vehicle with a secondary compact tractor for cleaning areas with limited access. Furthermore, a POSA would have been motivated to stow and transport the tractor on the bed portion of the Clemons cleaning system to easily transport the entire system as a self-contained unit. With the teaching of Schrunk in mind, a POSA would have been motivated to stow the tractor transversely on the truck bed portion of the vehicle in Clemons to achieve the benefits of loading and unloading the tractor in the same forward direction.

1. Claim 5

192. Dependent claim 5 requires that “said wheeled chassis is attached to said tractor and said mobile blast head and tractor are of a size for removably docking transversely on said bed portion of said truck.”

a. said wheeled chassis is attached to said tractor

193. As depicted in the various images of the StripeJet™, NLB discloses a support frame having wheels (*i.e.*, a wheeled chassis) attached to the tractor. Blastars-1006 at pg. 1, 4, and 5. Accordingly, it is my opinion that NLB discloses the limitation “said wheeled chassis is attached to said tractor.”

b. said mobile blast head and tractor are of a size for removably docking transversely on said bed portion of said truck

194. Claim 5 also includes a limitation “said mobile blast head and tractor are of a size for removably docking transversely on said bed portion of said truck.” In my opinion, Clemons in view of NLB and Schrunk discloses the blast head and tractor having a combined size for removably docking the tractor transversely on the bed portion of the truck. It is also my opinion that claim 5 does not impose any structural limitations on the size of the tractor and the blast head.

195. As explained in paragraph 52, Schrunk discloses a vehicle transversely stowed on the bed portion of a truck, thus the vehicle is of a size to be stowed transversely on the bed portion of the truck. Based on the teachings of Schrunk, a POSA would be motivated to select a tractor and cleaning head such that the

combined size of the two would enable the tractor to be loaded and stowed transversely on the bed portion of a truck.

196. NLB does not impose any size restrictions on the tractor and blast head, but rather teaches that a smaller vehicle is desirable for areas of limited access. Thus, a POSA, when considering the objective of both NLB and Schrunk, would have looked to modify the Clemons cleaning system by incorporating a compact tractor and blast head such that the tractor can clean areas of limited access with a tight turning radius and has a length in combination with the blast head that allows the tractor to be transversely loaded and stowed on the truck in Clemons. The mere scaling of the length of blast head and the length of the tractor would not have been particularly challenging or difficult for a POSA. Accordingly, it is my opinion that sizing the tractor and blast head to be loaded and stowed transversely on a bed portion of a truck was disclosed by the combination of Clemons, NLB, and Schrunk.

197. In the event that the claim is found to impose a structural limitation on the blast head and tractor, Clemons discloses an articulating link having the same structural capabilities as the articulating link in the '116 Patent. The '116 Patent describes an embodiment of the articulating link in which the blast head can “flipped up and back reducing the overall length to permit tractor 20 and blast head 23 to be stowed on a truck bed sideways.” *Blasters-1001* at 4:38-42. Clemons, however, discloses this same functionality. *See Blasters-1008* at 3:36-41 (“Arm 42 can be

manually pivoted or pivoted via a motorized force to raise/lower cleaning head 40 and set a forward-to-rear pitch angle of cleaning head 40 relative to surface 100.”). In other words, articulating link 42 in Clemons is structurally configured such that the cleaning head (*i.e.*, the blast head) can be flipped up and back (*i.e.*, increasing the pitch angle of the blast head) to reduce the overall length of the cleaning head and tractor.

198. Clemons further explains that during operation, “Cleaning head 40 is lowered onto surface 100 with its front-to-rear and side-to-side pitch being set to accommodate surface 100. Systems 90 and 92 are turned on and surface cleaner 10 is driven over surface 100.” *Id.* at 5:50-54. In other words, Clemons discloses that it is beneficial to adjust the front-to-rear pitch of the blast head based on the particular surface over which the cleaning system is to be driven. Thus, a POSA would have been motivated to modify the articulating arm on the NLB tractor to include structural features for adjusting the front-to-rear pitch of the blast head to account for the surface over which the tractor is to be driven.

199. Accordingly, it is my opinion that the limitations of claim 5 were disclosed by the combination of Clemons, NLB, and Schrunk for two reasons. First, the limitations of claim 5 lack structural limitations for either the tractor or the blast head and instead only require that the combined size of the tractor and blast head be of a size for transversely docking on a bed portion of a truck, which is a simple

design choice. Based on Schrunk, a POSA would have selected a tractor and a cleaning head of such sizes as to allow the assembly to be transversely docked on the truck bed in Clemons. Second, Clemons discloses a connecting structure adapted to alter the pitch angle of the cleaning head in substantially the same manner as disclosed in the '116 Patent for reducing the combined size of the tractor and blast head. Moreover, a POSA would have been motivated to adjust the structure of articulating link on the NLB tractor for manipulating the pitch angle of the blast head. Thus, Clemons in view of NLB and Schrunk teaches all limitations of claim 5.

2. Claim 6

200. Dependent claim 6 requires that “said bed portion includes a ramp, said ramp pivotally connected to said bed portion for raising and lowering said ramp, said ramp sized to support said tractor for docking transversely on said bed.” In my opinion, the combination of Clemons, NLB, and Schrunk discloses these limitations.

201. As explained in paragraphs 137-40, Schrunk discloses the limitation “said bed portion includes a ramp, said ramp pivotally connected to said bed portion for raising and lowering said ramp, said ramp sized to support said tractor for docking transversely on said bed.” A POSA would have been motivated to modify Clemons to include the ramp and its features as disclosed in Schrunk for loading/unloading the tractor on the bed portion of the truck in Clemons. Such

modifications would also have been straightforward, not requiring undue experimentation, and would produce predictable results. Therefore, it is my opinion that the combination of Clemons, NLB, and Schrunk discloses all the limitations of claim 6.

202. Accordingly, based on the foregoing, it is my opinion that claims 1-6 and 10 are obvious in view of the prior art references disclosed herein and explained.

X. CONCLUSION

203. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I further understand that I may be subject to cross-examination. If cross-examination is required, I will make myself available within the United States during the period designated for cross-examination.

204. I hereby declare that all statements made in this declaration are of my own knowledge and are true, and that all statements made on information and belief are believed to be true; that these statements were made with the knowledge that willfully 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.

***Inter Partes Review of U.S. Patent No. 7,255,116
Declaration of Scott F. Boos (Blasters-1009)***

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Scott F. Boos', with a long horizontal flourish extending to the right.

Scott F. Boos

Date: January 13, 2018