

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

PETITION FOR INTER PARTES REVIEW

OF

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

Challenged Claims 1-6 and 10

TABLE OF CONTENTS

I.	MANDATORY NOTICES	8
A.	Real Party-in-Interest	8
B.	Related Matters.....	8
C.	Designation of Counsel and Service Information	8
II.	GROUND FOR STANDING.....	8
III.	INTRODUCTION	9
IV.	Level of Ordinary Skill in the Art	11
V.	STATEMENT OF RELIEF REQUESTED AND REASONS THEREFOR (37 C.F.R. § 42.22(a))	11
VI.	STATUTORY GROUNDS FOR THE CHALLENGE	12
A.	Grounds are not redundant	12
VII.	CLAIM CONSTRUCTION	13
A.	“hard surface” (Claims 1 and 4).....	13
B.	“high pressure” (Claim 1)	13
C.	“blast head” (Claims 1, and 3-5)	14
D.	“sump” (Claims 1-2)	15
E.	“connected to” (Claims 1-3 and 6).....	15
F.	“coatings” (Claim 1).....	15
G.	“high power vacuum pump” (Claims 1 and 2).....	16
H.	“mobile frame” (Claim 1)	16
I.	“articulating link” (Claims 1 and 10)	17
J.	“controlled movement” (Claims 10)	17
VIII.	IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE....	17
A.	Relevant law	17
B.	Ground 1: Claims 1, 2, and 10 are obvious over Jones in view of Breither	18
1.	Overview of Jones.....	18

2.	Overview of Breither	20
3.	Overview of NLB.....	21
4.	Combination of Jones, Breither, and NLB	23
5.	Claim 1	26
a.	“A cleaning system for removing coatings from a hard surface by high pressure liquid ...”	26
b.	“a liquid reservoir connected to a high pressure pump”	28
c.	“said pump connected to a mobile blast head by a high pressure hose”	30
d.	“said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface”	31
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”	32
f.	“said sump connected to said liquid reservoir”	34
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”	35
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”	37
i.	“said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame”	38
j.	“said mobile frame forming an integral part of a truck having a bed portion and a cab portion, said truck being self-propelled”	41
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”	42
l.	“said tractor including an engine for propulsion thereof”	43

m.	“wherein said high pressure hose and said waste removal hose extend between said truck and said tractor”	44
n.	“whereby said tractor is utilized to maneuver said blast head”.	45
6.	Claim 2	45
7.	Claim 10	46
C.	Ground 2: Claims 3 and 4 are obvious over the combination of Jones, Breither, NLB, and Herhold	47
1.	Claim 3	47
2.	Claim 4	49
D.	Ground 3: Claims 5 and 6 are obvious over combination of Jones, Breither, Herhold, and Schrunk	50
1.	Claim 5	50
a.	“wherein said wheeled chassis is attached to said tractor”	50
b.	“said mobile blast head and tractor are of a size for removably docking transversely on said bed portion of said truck”	51
2.	Claim 6	56
E.	Ground 4: Claims 1-4 are obvious based on Clemons in view of NLB	58
1.	Overview of Clemons	58
2.	Overview of the combination of Clemons and NLB	59
3.	Claim 1	63
a.	A cleaning system for removing coatings from a hard surface by high pressure liquid	63
b.	a liquid reservoir connected to a high pressure pump, ...	64
c.	said pump connected to a mobile blast head by a high pressure hose,	64
d.	said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface,	66

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	67
f.	said sump connected to said liquid reservoir,.....	69
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,.....	69
h.	said liquid and coatings conveyed through said waste removal hose to said sump via a high power vacuum pump, ...	70
i.	said coatings collected in said sump,.....	71
j.	said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame,	71
k.	said mobile frame forming an integral part of a truck having a bed portion and a cab portion, said truck being self-propelled.....	72
l.	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	73
m.	said tractor including an engine for propulsion thereof .	74
n.	wherein said high pressure hose and said waste removal hose extend between said truck and said tractor.....	75
o.	whereby said tractor is utilized to maneuver said blast head	76
4.	Claim 2	76
5.	Claim 3	78
6.	Claim 4	80
7.	Claim 10	81
F.	Ground 5: Claims 5-6 are obvious based on Clemons in view of NLB and in further view of Schrunk	82
1.	Claim 5	83
a.	said wheeled chassis is attached to said tractor	83

b.	said mobile blast head and tractor are of a size for removably docking transversely on said bed portion of said truck.....	83
2.	Claim 6.....	86
IX.	CONCLUSION.....	86

TABLE OF AUTHORITIES

Cases

<i>Apple Inc. v. Samsung Electronics Co., Ltd.</i> , 839 F.3d 1034 (Fed. Cir. 2016)	11, 19, 54, 69
<i>DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.</i> , 464 F.3d 1356 (Fed. Cir. 2006)	19, 59, 70
<i>KSR Intern. Co. v. Teleflex Inc.</i> , 550 U.S. 398 (U.S. 2007).....	11
<i>Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.</i> , 485 F.3d 1157 (Fed. Cir. 2007)	77
<i>National Connector Corp. v. Malco Mfg. Co.</i> , 392 F.2d 766 (8th Cir. 1968)	46
<i>Pacific Surf Designs, Inc. v. Surf Waves, Ltd.</i> , 2017 WL 506465 (P.T.A.B. 2017)	8
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	7

Statutes

35 U.S.C. § 102(a)	15
35 U.S.C. § 102(b)	11, 13
35 U.S.C. § 103	10, 11, 51

Rules

37 C.F.R. § 42.100(b)	6
37 C.F.R. § 42.22(a).....	4

I. MANDATORY NOTICES

A. Real Party-in-Interest

The real party-in-interest is Petitioner, Blasters, Inc.

B. Related Matters

As of the filing of this Petition and to the best knowledge of the Petitioner, U.S. Patent No. 7,255,116 (the “‘116 Patent”) is involved in the case *Waterblasting, LLC, d/b/a Waterblasting Technologies v. Blasters, Inc.*, Case No.: 8:17-cv-02660-CEH-MAP, which might affect or be affected by a decision in this proceeding.

C. Designation of Counsel and Service Information

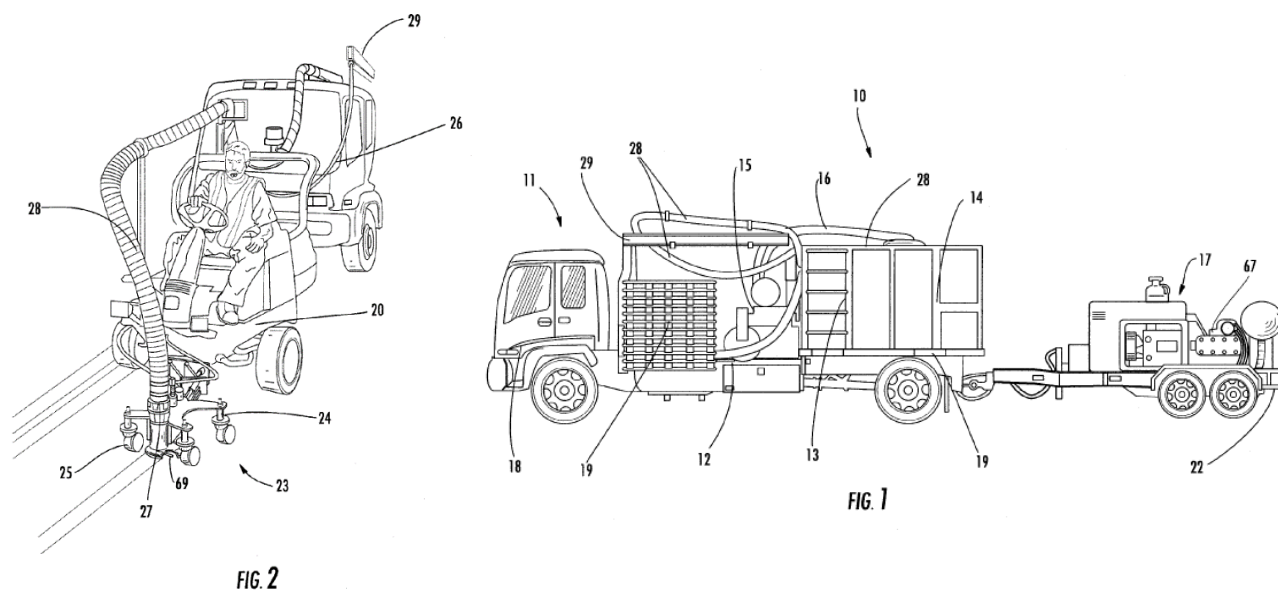
Petitioner designates Nicholas Pfeifer (Reg. No. 70,568) as lead counsel and both Anton Hopen (Reg. No. 41,849) and Andriy Lytvyn (Reg. No. 65,166) as backup counsel. All are available at 180 Pine Avenue North, Oldsmar, Florida 34677. Please address all correspondence to lead and backup counsel. Petitioner consents to service by electronic email at np@smithhopen.com, al@smithhopen.com, ah@smithhopen.com, and ipr@smithhopen.com.

II. GROUNDS FOR STANDING

Petitioner certifies that the ‘116 Patent is available for *inter partes* review (“IPR”), and that Petitioner is not barred or estopped from requesting IPR of any claim of the ‘116 Patent.

III. INTRODUCTION

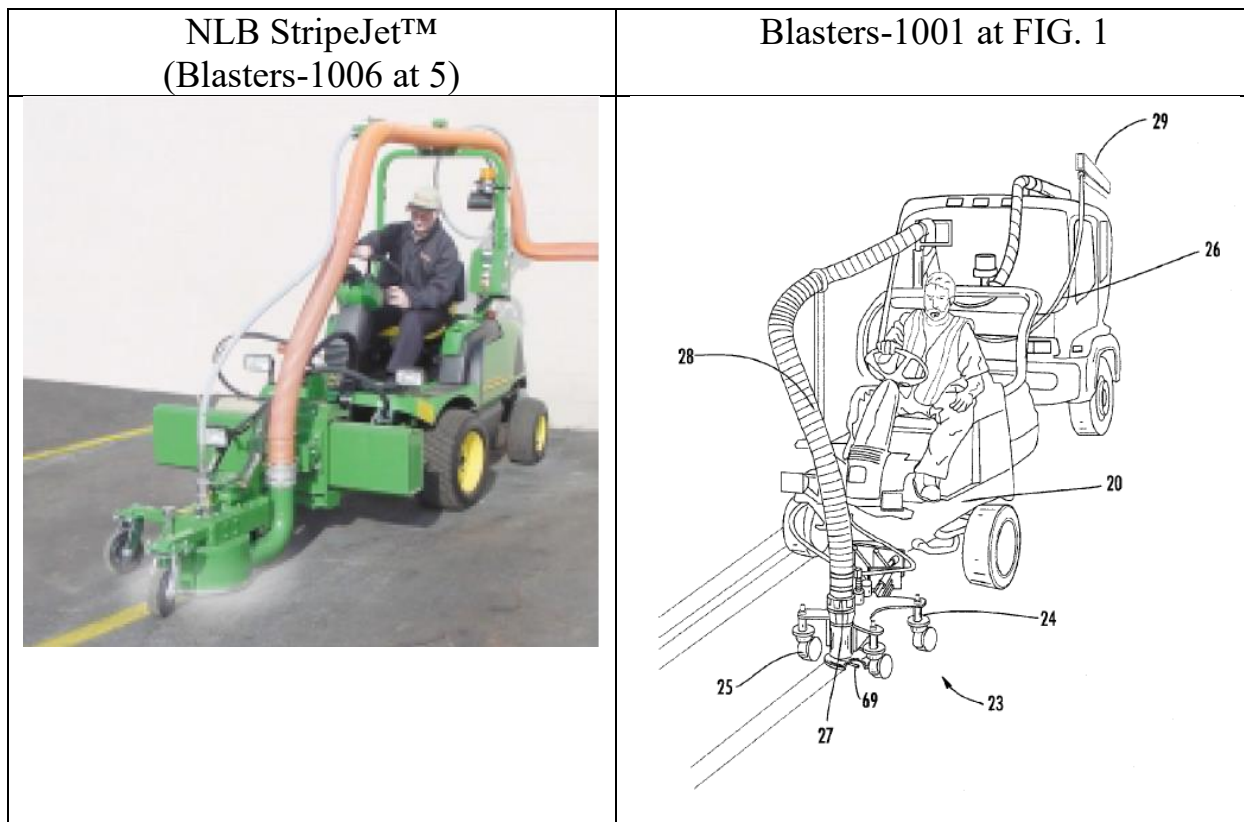
The '116 Patent discloses and claims "a cleaning system for removing coatings from a hard surface by high pressure liquid." Blasters-1001 at 6:35-36. The claimed system comprises a tractor that removes foreign substances from a surface using pressurized liquid and a vacuum system. *Id.* at Abstract. The tractor is tethered to a support truck carrying the water supply and the vacuum system for removing spent liquid and debris. *Id.* When considered together, FIGS. 1 and 2 of the '116 Patent illustrate the cleaning system disclosed and claimed therein:



Blasters-1001 at FIG. 1-2

The evidence presented in this Petition establishes a reasonable likelihood that claims 1-6 and 10 recite nothing more than an obvious combination of well-known components. Indeed, the '116 Patent itself admits that most claimed components

existed in the prior art. The ‘116 Patent specifically references Petitioner’s own stripe removal system, which significantly overlaps with the ‘116 Patent because both systems involve “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 [positioned] on the front of the tractor.” *Id.* at 2:10-14. The ‘116 Patent also identifies another stripe removal system—the StripeJet™—which mirrors the ‘116 Patent in multiple respects: “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.” *Id.* at 2:5-7. A side-by-side comparison of the StripeJet™ and the tractor in the ‘116 Patent is provided below:



The ‘116 Patent attempts to distinguish itself by identifying the following alleged deficiency: “[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”.” *Id.* at 2:15-18. Despite acknowledging the expansive scope of the prior art and identifying a very narrow objective, Patent Applicant sought untenably broad claims directed to a cleaning system comprising a trivial arrangement of well-known components. Had the USPTO been aware of the evidence submitted with this Petition during examination of the ‘116 Patent, there is a reasonable likelihood that claims 1-6 and 10 would not have been issued.

IV. Level of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSA”) at the time of the invention would have had 4-5 years of experience working with surface cleaning devices and systems. 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. STATEMENT OF RELIEF REQUESTED AND REASONS THEREFOR (37 C.F.R. § 42.22(a))

Petitioner requests cancellation of claims 1-6 and 10. Petitioner’s full statement of the reasons for the relief requested is set forth below.

VI. STATUTORY GROUNDS FOR THE CHALLENGE

Petitioner requests review of claims 1-6 and 10 based on the following grounds:

GROUND 1: Claims 1, 2, and 10 are obvious over the combination of Jones (Blasters-1002), Breither (Blasters-1003), and NLB (Blasters-1006).

GROUND 2: Claims 3-4 are obvious over the combination of Jones, Breither, NLB, and Herhold (Blasters-1004).

GROUND 3: Claims 5-6 are obvious over the combination of Jones, Breither, NLB, Herhold, and Schrunk (Blasters-1005).

GROUND 4: Claims 1-4 and 10 are obvious over the combination of Clemons (Blasters-1008) and NLB.

GROUND 5: Claims 5-6 are obvious over the combination of Clemons, NLB and Shrunck.

A. Grounds are not redundant

Grounds 1-3 and Grounds 4-5 are not redundant. Grounds 1-3 are stronger than 4- 5 with respect to one key aspect: Grounds 1-3 use Jones as a base reference, which discloses a cleaning system involving a tractor tethered to a truck. However, Grounds 1-3 are weaker than Grounds 4-5 in another important aspect: Jones does not expressly disclose a water reservoir, which is present in all challenged claims.

Thus, Grounds 1-3 and Ground 4-5 are not redundant and should all be instituted for the following reasons.

VII. CLAIM CONSTRUCTION

This Petition analyzes the claims under their broadest reasonable interpretation (BRI) in light of the specification. *See* 37 C.F.R. § 42.100(b).

A. “hard surface” (Claims 1 and 4)

The term “hard surface” should be construed as “any surface having rigidity sufficient to support the weight of a vehicle carrying the blast head.” *Blasters-1009* at ¶ 16. Although the ‘116 Patent does not provide a definition for this term, the specification clarifies that “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). Thus, under BRI, any surface on which the vehicle carrying the blast head can be driven qualifies as a “hard surface.”

B. “high pressure” (Claim 1)

A dictionary definition of the term “high pressure” is “of or relating to pressures higher than normal, especially higher than atmospheric pressure.” *See* *Blasters-1009* at ¶ 18; *Blasters-1010*. Claim 1 uses the term “high pressure” as a qualifier to describe four mechanical components: “high pressure pump,” “high

pressure liquid,” “high pressure hose,” and “high pressure nozzle.” Claim 1 does not impose any quantitative limits or ranges on the qualitative adjective “high.”

Although the specification of the ‘116 Patent discloses an example of a high-pressure pump capable of achieving pressures “greater than 25,000-40,000 psi,” Patent Applicant excluded this numerical range from claim 1. *Id.* at 3:59-60. It is axiomatic that a disclosure that is excluded from the claims during prosecution cannot be read into the claims after the patent issues. *See, e.g., Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005). Having relinquished the opportunity to define the term “high pressure” or quantitatively claim a range, Patent Owner is precluded from reading limitations from an example provided in the specification into the claims or arguing for a construction that is narrower than the BRI. Accordingly, the qualifier “high pressure” should be construed according to the dictionary definition quoted above: “of or relating to pressures higher than normal, especially higher than atmospheric pressure.”

C. “blast head” (Claims 1, and 3-5)

The term “blast head” is a term of art that refers to “a mechanical component having one or more nozzles for ejecting a substance onto a surface.” *Blasters-1009* at ¶ 20. This definition is consistent with the usage of the term “blast head” in the specification and claims of the ‘116 Patent. The most informative sentence pertaining to the meaning of this term states the following: “[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. Therefore, the construction provided above is proper under the BRI standard.

D. “sump” (Claims 1-2)

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-1009 at ¶ 22; Blasters-1011.

E. “connected to” (Claims 1-3 and 6)

The term “connected to” should be construed in accordance with its plain and ordinary meaning: directly or indirectly joined or linked together. *See* Blasters-1009 at ¶ 24; Blasters-1012. Indeed, 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, *4 (P.T.A.B. 2017) (citation and quotations omitted).

F. “coatings” (Claim 1)

The ‘116 Patent recites the term “coatings” throughout its claims, but does not expressly define this term. Under the BRI, the term “coatings” should be construed

in accordance with its dictionary definition: “a layer of *any* substance spread over a surface.” *See* Blasters-1009 at ¶ 26; Blasters-1013 (emphasis added).

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

A dictionary definition of the term “high power” is “having greater than normal strength or capabilities.” *See* Blasters-1009 at ¶ 28; Blasters-1014. With respect to the strength 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* Blasters-1001 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 having a capability to remove liquid and substances from a surface.

H. “mobile frame” (Claim 1)

The term “mobile frame” has a first meaning as used in claim 1, and a second, non-sequitur definition provided in the specification. Claim 1 requires that “said mobile frame form[s] an integral part of a truck.” *See id.* at 6:51. In contrast, the specification states that “[t]he mobile frame is a self-propelled tractor.” *See id.* at 2:28. These conflicting definitions are a product of a clear drafting error because the mobile frame cannot be both the self-propelled tractor and, also, an integral part of the truck.

Within the meaning of the claim, “mobile frame” should be construed as a chassis. *See* Blasters-1009 at ¶ 31. A dictionary definition of the term “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. Blasters-1009 at ¶ 31.

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

The technical definition of the term “articulation” is “the connection of two parts in such a way (usually by a pin joint) as to permit relative movement.” *See* Blasters-1011. 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.” *See* Blasters-1009 at ¶ 33.

J. “controlled movement” (Claims 10)

The term “controlled movement” should be construed as movement in a predetermined path. Blasters-1009 at ¶ 35.

VIII. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

A. Relevant law

A claim is invalid under 35 U.S.C. § 103 if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art.” *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 399 (U.S. 2007) (citations omitted). “In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103” *Id.* at 420. Moreover, “when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious.” *Apple Inc. v. Samsung Electronics Co., Ltd.*, 839 F.3d 1034, 1072 (Fed. Cir. 2016) (citations omitted). Finally, “[a] simple substitution of one known element for another makes the claimed invention obvious.” *Id.* at 1077 (internal quotations omitted).

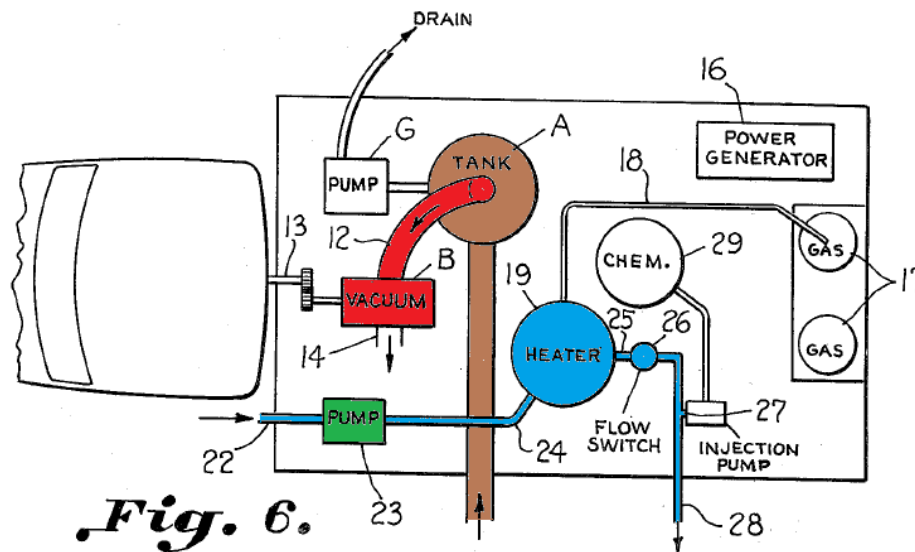
B. Ground 1: Claims 1, 2, and 10 are obvious over Jones in view of Breither

1. Overview of Jones

Jones is a U.S. patent issued on September 2, 1975 and, therefore, qualifies as prior art against the ‘116 Patent under 35 U.S.C. § 102(b). *Blasters-1002* at pg. 1. As depicted below, Jones discloses a water jet cleaning system having a motorized utility vehicle (Fig. 3) and a service truck (Fig. 6). *Id.* at Abstract. The motorized utility vehicle pulls a cleaning head attached thereto via a swivel joint. *Id.* at 3:62 – 67. The cleaning head (emphasized in yellow) includes a plurality of spray nozzles and a suction nozzle. *Id.* at Abstract. The spray nozzles eject pressurized liquid onto

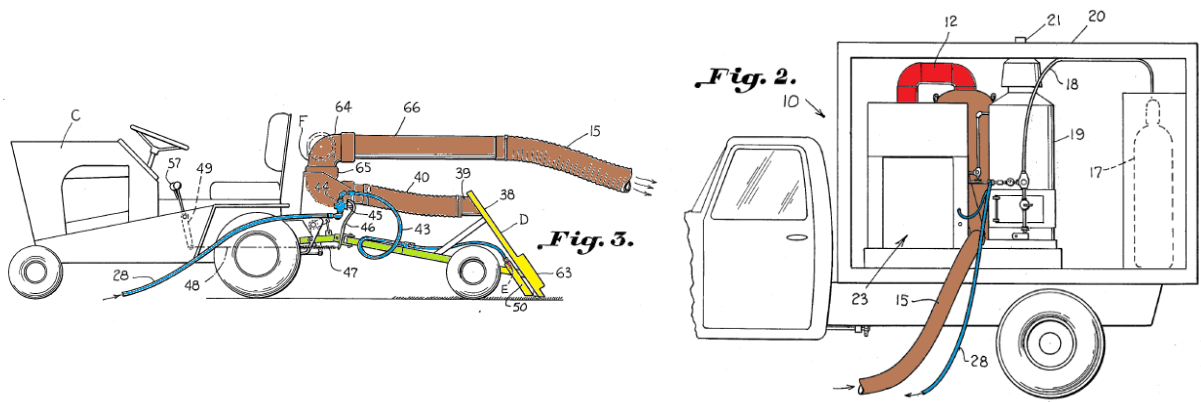
a surface being cleaned, while the suction nozzle removes spent liquid and foreign matter from the surface via vacuum suction. *Id.*

The service truck carries a vacuum tank (emphasized in brown), a vacuum pump (emphasized in red), and a pressure booster pump (emphasized in green), which is coupled to a water source (emphasized in blue). *Id.* at 2:18-20, 2:57-64.



Blasters-1002 at FIG. 6 (annotated)

The water hose and the vacuum hose extend from the service truck to the cleaning head carried by the utility vehicle. *Id.* at 2:59 – 3:2, 3:36-43. The water hose supplies the pressurized liquid to the spray nozzles, while the vacuum hose conveys the removed liquid and foreign matter to the vacuum tank. *Id.* 6:8-16. When considered together, FIGS. 3 and 2 of Jones illustrate the principle of operation of the cleaning system disclosed therein:

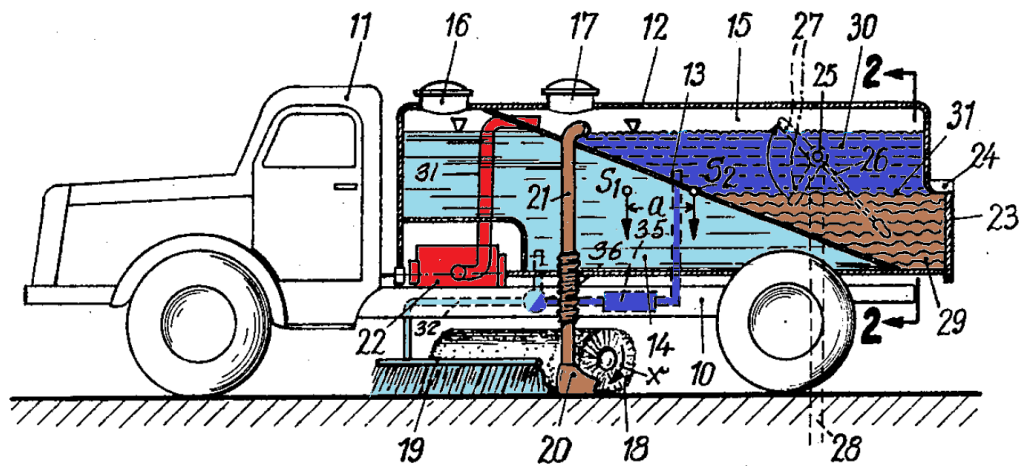


Blasters-1002 at FIGS. 3 and 2 (annotated)

2. Overview of Breither

Breither is a U.S. patent issued on December 5, 1961 and, therefore, qualifies as prior art against the ‘116 Patent under 35 U.S.C. §102(b). Blasters-1003 at pg. 2. Breither discloses a cleaning system for removing foreign matter from a surface. *Id.* at Abstract. As illustrated below, Breither discloses a truck carrying a tank, wherein the tank is partitioned into a liquid reservoir (emphasized in light blue) and a mud container (*i.e.* sump) (emphasized in brown and dark blue). *Id.* at 2:24-35, FIG. 1. Water is supplied from the liquid reservoir to a spraying device, which “sprays powerful jets of water” onto the road. *Id.* at 2:43-46. A vacuum pump (emphasized in red) is connected to the sump and maintains a negative pressure therein. *Id.* at 2:56-60. A vacuum hose (emphasized in brown) connects a suction device (also emphasized in brown) to the negatively pressurized sump and conveys spent liquid and removed foreign matter from the ground to the sump. *Id.*

Fig.1



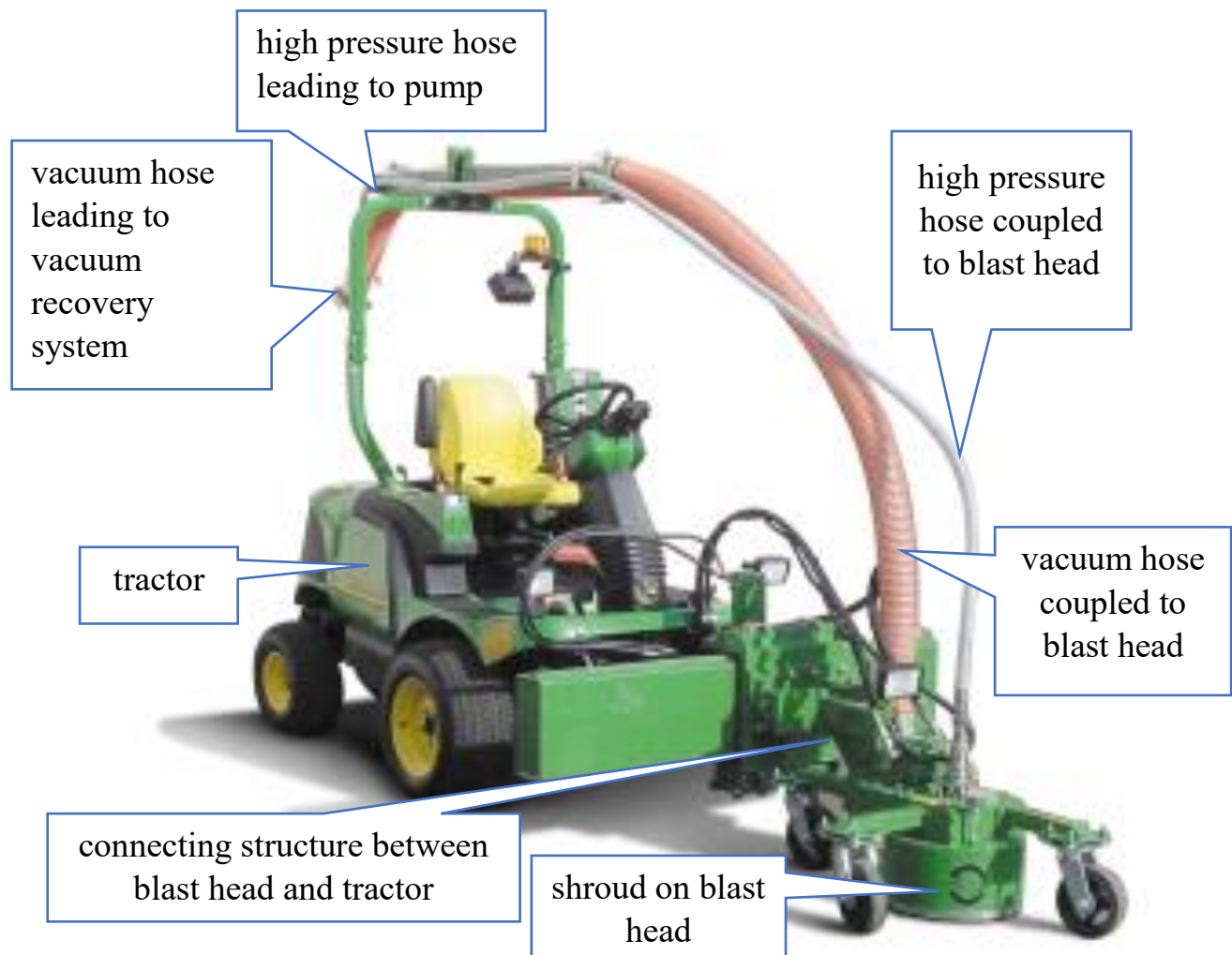
Blasters-1003 at FIG. 1 (annotated)

Breither describes advantages of interconnecting—both structurally and fluidly—the sump and the liquid reservoir. *Id.* at 3:35-39; 3:67-71. Specifically, with respect to a structural connection, Breither discloses 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 a fluid connection, Breither discloses: “[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.

3. Overview of NLB

NLB was published on the Internet at least as early as March 27, 2004 and, therefore, qualifies as prior art against the ‘116 Patent under 35 U.S.C. §102(a). Blasters-1006 at 2. NLB discloses a water blasting system, known as the StripeJet™, that “completely removes coatings” from pavement and concrete floors. The StripeJet™ is identified in the ‘116 Patent as pertinent prior art. Blasters-1001 at 2:4-7.

The StripeJet™ system delivers pressurized water (up to 40,000 psi) through a nozzle assembly (*i.e.*, blast head) mounted onto a compact utility vehicle (*i.e.*, a tractor). Blasters-1006 at 2. NLB discloses that 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.” *Id.* at 2. NLB further discloses that the cleaning system can be equipped with a high-power, 1,000 CFM vacuum pump. *Id.* at 4. An image of the StripeJet™ system is reproduced and annotated below.



Blasters-1006 at 4 (annotated)

4. Combination of Jones, Breither, and NLB

There is significant overlap between the cleaning systems disclosed in Jones, Breither, and NLB. Blasters-1009 at ¶ 58. They each disclose self-propelled cleaning systems for removing foreign substances from a surface, wherein 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. *Id.* The following explanation provides a reasoning as to why a POSA would combine various components of these system and how the resulting combination would operate.

Jones discloses a cleaning system in which the “water is supplied ... from any suitable source.” Blasters-1002 at 2:57-58 (emphasis added). Jones also discloses that “it is an important object of the present invention to provide a *portable* device for cleaning large areas.” *Id.* at 1:23-25 (emphasis added). Thus, a POSA would have been motivated to improve the cleaning system disclosed in Jones by making it independent from an external water supply, thereby increasing its portability. Blasters-1009 at ¶ 59.

Breither discloses a suitable solution: the water used by its cleaning system is supplied from a liquid reservoir mounted onto the truck. Blasters-1003 at 2:21-35. After reading Breither, it would have been obvious to a POSA to improve the cleaning system of Jones by mounting a liquid reservoir onto the service truck to achieve a more portable cleaning system that is not reliant on an external water supply. Blasters-1009 at ¶ 60. When making this modification, a 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. *Id.* at ¶ 61. 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 3:35-39. Breither also discloses that by coupling the water reservoir and the sump, the water collected in the sump can be

reused, thereby extending the duration of continuous operation of the cleaning system and reducing the amount of water needed. *Id.* at 3:67-72.

To achieve these advantages, a POSA would simply replace Jones's vacuum tank with Breither's partitioned tank and then couple the appropriate hoses of Jones's cleaning system to the liquid reservoir and the sump partitions of Breither's tank. Blasters-1009 at ¶ 62. The fresh-water container of Breither would serve as "any suitable [liquid] source" disclosed in Jones and would supply water to the pressure booster pump. *Id.* The mud container of Breither would function as a sump, wherein the vacuum pump already present in Jones would maintain a negative pressure within the sump. *Id.* Such modifications would have been straightforward, not requiring undue experimentation, and would produce predictable results. *Id.*

A POSA would understand that the cleaning system achieved by the combination of Jones and Breither can be further improved by increasing the power of the vacuum pump and the pressure of the cleaning solution, which would expand the capabilities of the cleaning system to a wider array of applications. *Id.* at ¶ 63. A POSA have been aware of NLB's StripeJet™ system, which is designed for "ultra-high pressure water (up to 40,000 psi ...)," and is capable of "[f]loor coating removal." Blasters-1006 at 4; Blasters-1009 at ¶ 63. A POSA would have been motivated to combine Jones and Breither with NLB to achieve a cleaning system

having improved characteristics and increased capabilities. See *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006); Blasters-1009 at ¶ 63.

When combining Jones and Breither with NLB, it would have been obvious to replace Jones' vacuum pump, water pump, water hose, and nozzles with NLB's high-power, 1,000 CFM vacuum pump, and "ultra-high-pressure" water pump, water hose, and nozzles designed for pressures of up to 40,000 psi. Blasters-1009 at ¶ 63. The pumps, hoses, and nozzles are interchangeable, and it is well established that "[a] simple substitution of one known element for another makes the claimed invention obvious." *Apple Inc. v. Samsung Electronics Co., Ltd.*, 839 F.3d 1034, 1077 (Fed. Cir. 2016) (internal quotations omitted). Such modifications would also have been straightforward, not requiring undue experimentation, and would produce predictable results. Blasters-1009 at ¶ 63.

5. Claim 1

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

Jones discloses "*a pressurized cleaning medium, . . . said cleaning head for spraying said cleaning medium on said turf ahead of said suction nozzle . . . and means . . . for conveying away the used cleaning medium and foreign matter removed from the turf.*" Blasters-1002 at 6:8-16 (emphasis added).

As established in Part VII(F), *supra*, the term “coatings” should be construed as “a layer of *any* substance spread over a surface.” Jones discloses a cleaning system for removing “foreign matter,” such as “oily fallout, soot, broken glass, and other hazardous materials” from a surface. Blasters-1002 at 1:9-11. Therefore, Jones teaches a cleaning system for removing coatings. Blasters-1009 at ¶ 64.

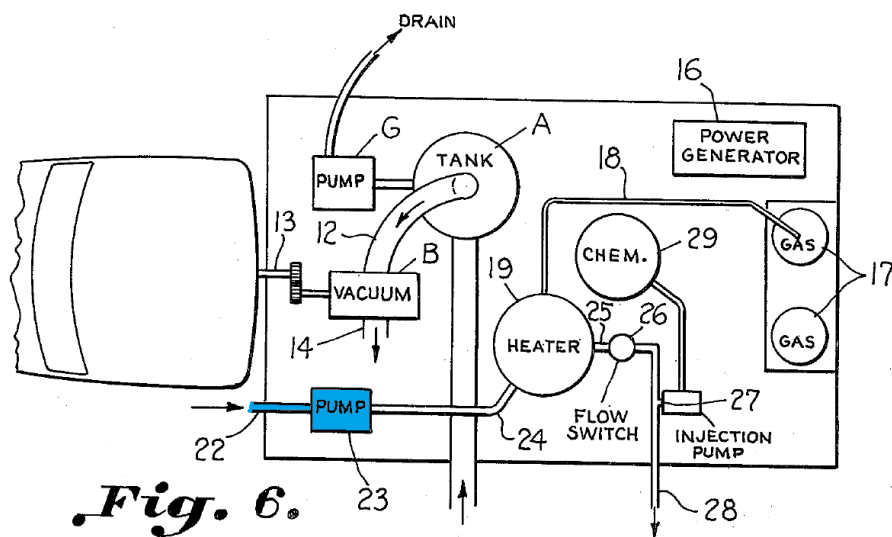
Next, claim 1 recites a “hard surface.” As established in Part VII(A), *supra*, this term should be construed as “any surface having rigidity sufficient to support the weight of a vehicle carrying a blast head.” Jones discloses a cleaning system for an artificial turf, wherein a key aspect of the cleaning system is that a motorized utility vehicle carrying a cleaning head must be driven on the artificial turf. Blasters-1002 at 1:63-64. Thus, the artificial turf disclosed in Jones qualifies as a hard surface as recited in claim 1. Blasters-1009 at ¶ 66.

Finally, the preamble of claim 1 recites the term “high pressure liquid,” which should be construed as “a liquid pressurized to a pressure exceeding the atmospheric pressure.” *See supra* Part VII(B). Jones discloses a “pressurized cleaning medium” and a “pressure booster pump [] which build[s] the pressure of the water to approximately 200 pounds per square inch,” which is more than thirteen times greater than the normal atmospheric pressure. *Id.* at 2:60-62; Blasters-1009 at ¶ 67. Furthermore, as established in Part VIII(B)(4), *supra*, it would have been obvious to combine Jones and Breither with NLB to achieve “ultra-high pressure water” of up

to 40,000 psi capable of removing “coating[s]” from a concrete floor. Blasters-1006 at 2, 4 (emphasis added). Therefore, the combination of Jones, Breither, and NLB renders obvious “a cleaning system for removing coatings from a hard surface by high pressure liquid.” Blasters -1009 at ¶ 68.

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

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.” *Id.* at 2:57-62. FIG. 6 is reproduced below with the connection from the water supply to the pressure booster pump emphasized in blue:

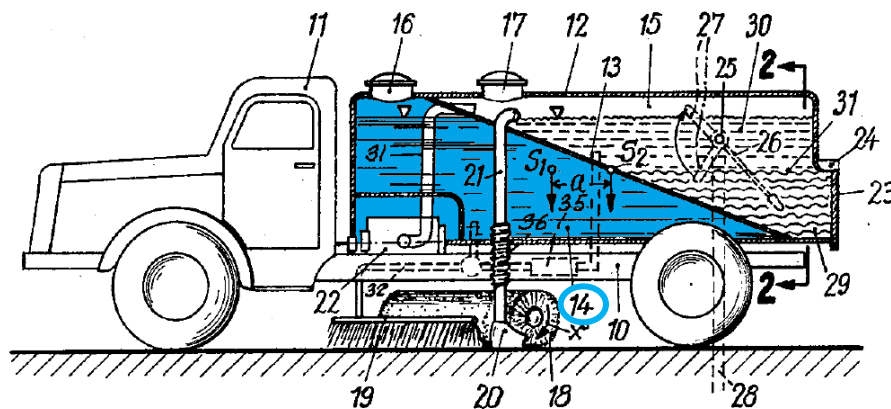


Blasters-1002 at FIG. 6 (annotated)

As established in Part VIII(B)(4), *supra*, although Jones does not expressly disclose a liquid reservoir, it would have been obvious for a POSA to improve the

cleaning system disclosed in Jones by mounting partitioned tank 12 of Breither onto the service truck of Jones. Blasters-1009 at ¶ 70. Tank 12 of Breither contains a fresh-water container 14 (emphasized in blue), to which water supply line 22 of Jones would be fluidly coupled:

Fig.1

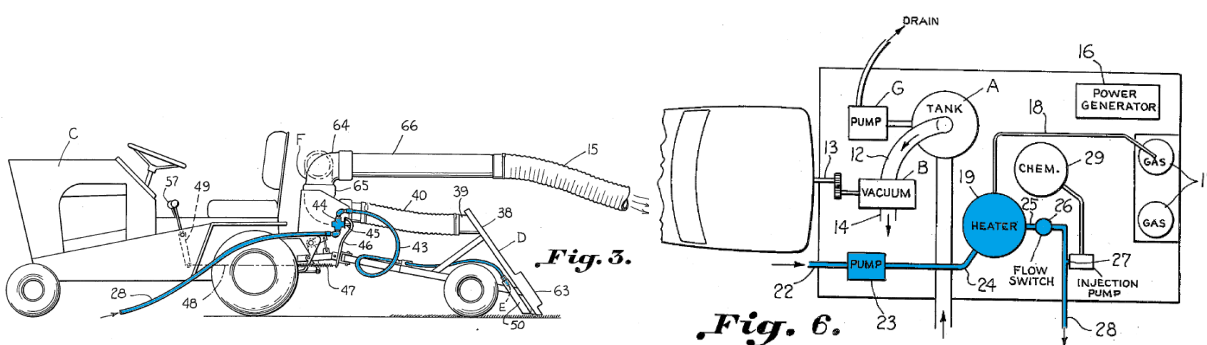


Blasters-1003 at FIG. 1 (annotated)

Thus, Jones in view of Breither teaches a liquid reservoir connected to a high-pressure pump that pressurizes the liquid to a pressure exceeding the atmospheric pressure. Blasters-1009 at ¶ 72-73. Furthermore, it would have been obvious for a POSA to replace Jones' high pressure pump with NLB's "ultra-high pressure," 40,000 psi pump. Blasters-1006 at 2; Blasters-1009 at ¶ 74-75. Thus, the combination of Jones, Breither, and NLB renders obvious "a liquid reservoir connected to a high pressure pump." *Id.*

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

Jones discloses a water delivery system in which pressure booster pump 23 supplies pressurized water to the cleaning head (*i.e.* mobile blast head) via hose 28. Blasters-1002 at 2:62-68. The flow path of the water from the pressure booster pump to the cleaning head is emphasized using blue color in the drawings below:



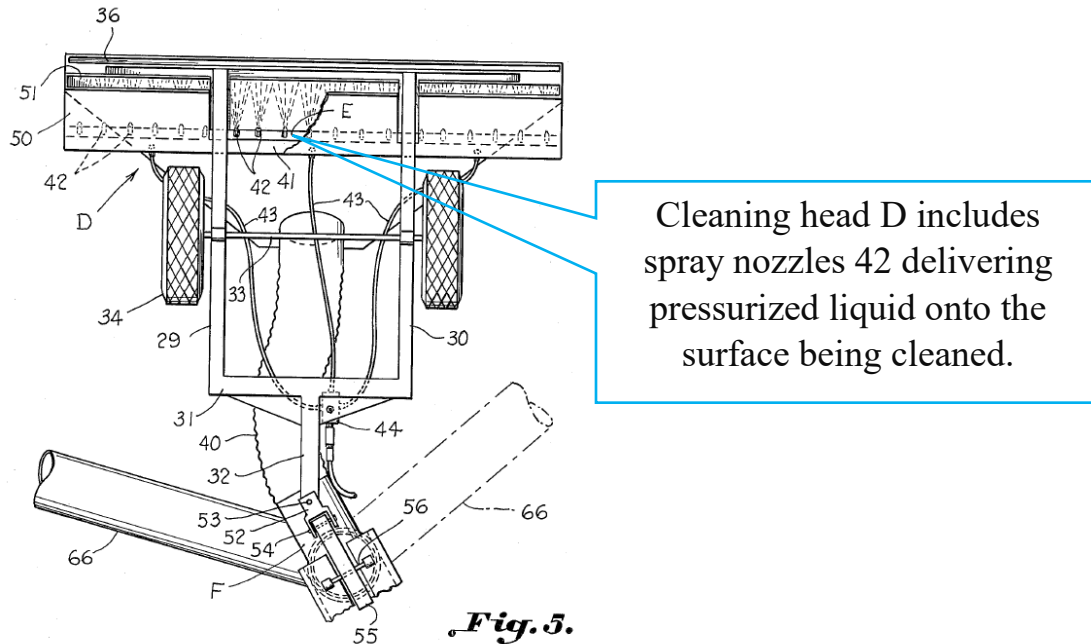
Blasters-1002 at FIGS. 3 and 6 (annotated)

Thus, Jones discloses that hose 28 fluidly connects the high-pressure pump to the cleaning head. Blasters-1009 at ¶ 76. Because hose 28 is designed to carry a liquid at a pressure above the ambient pressure, hose 28 satisfies the “high pressure hose” limitation of claim 1. *See* Part VII(B), *supra*. Furthermore, it would have been obvious for a POSA to replace the high-pressure hose 28 of Jones with the hose designed for “ultra-high pressure” as disclosed in NLB. *See* Part VIII(B)(4), *supra*; Blasters-1009 at ¶ 79.

Based on the foregoing, Jones in view of NLB teaches a high-pressure pump fluidly connected to a mobile blast head by a high-pressure hose. If the Board were to interpret, erroneously, that the term “connected” requires a physical connection between the pump and the hose, it would have been obvious for a POSA to simplify the cleaning system of Jones by eliminating the heating and the chemical injection systems and directly connecting hose 28 to the outlet of pump 23. Blasters-1009 at ¶ 78. Thus, Jones in view of NLB renders obvious “said pump connected to a mobile blast head by a high pressure hose.” *Id.* at ¶ 79.

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

Jones discloses 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. As depicted below, hose 28 supplies pressurized liquid to spray nozzles 42, through which the liquid is delivered onto a surface being cleaned.

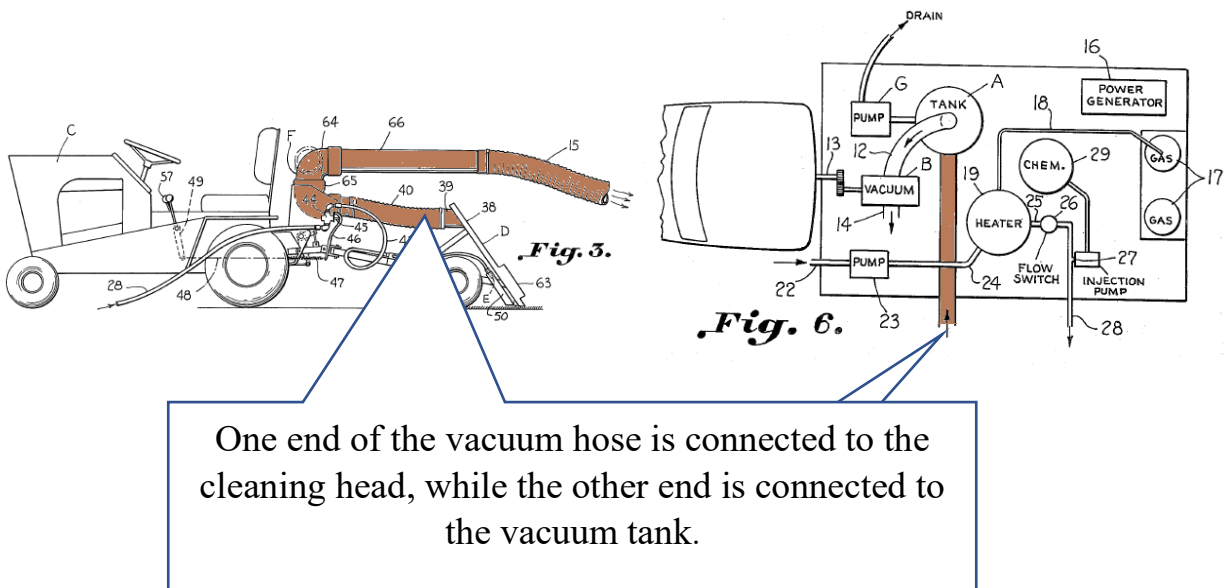


Blasters-1002 at FIG. 5 (annotated)

Because the sprayed liquid is pressurized above atmospheric pressure, the “high pressure nozzle” and “high pressure liquid” limitations of claim 1 are satisfied. *See supra* Part VII(B). Moreover, it would have been obvious for a POSA to replace the high-pressure nozzle 42 of Jones with a nozzle designed for “ultra-high pressure” disclosed in NLB. *See* Part VIII(B)(4), *supra*; Blasters-1009 at ¶ 82. Thus, the combination of Jones and NLB renders obvious “said blast head having at least one high pressure nozzle for delivering high pressure liquid onto a hard surface.” *Id.*

- 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”

Jones discloses that “[c]ommunicating 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.” Blasters-1002 at 2:41-43. FIGS. 3 and 6 of Jones depict the waste removal hose connected to the blast head and the vacuum tank:

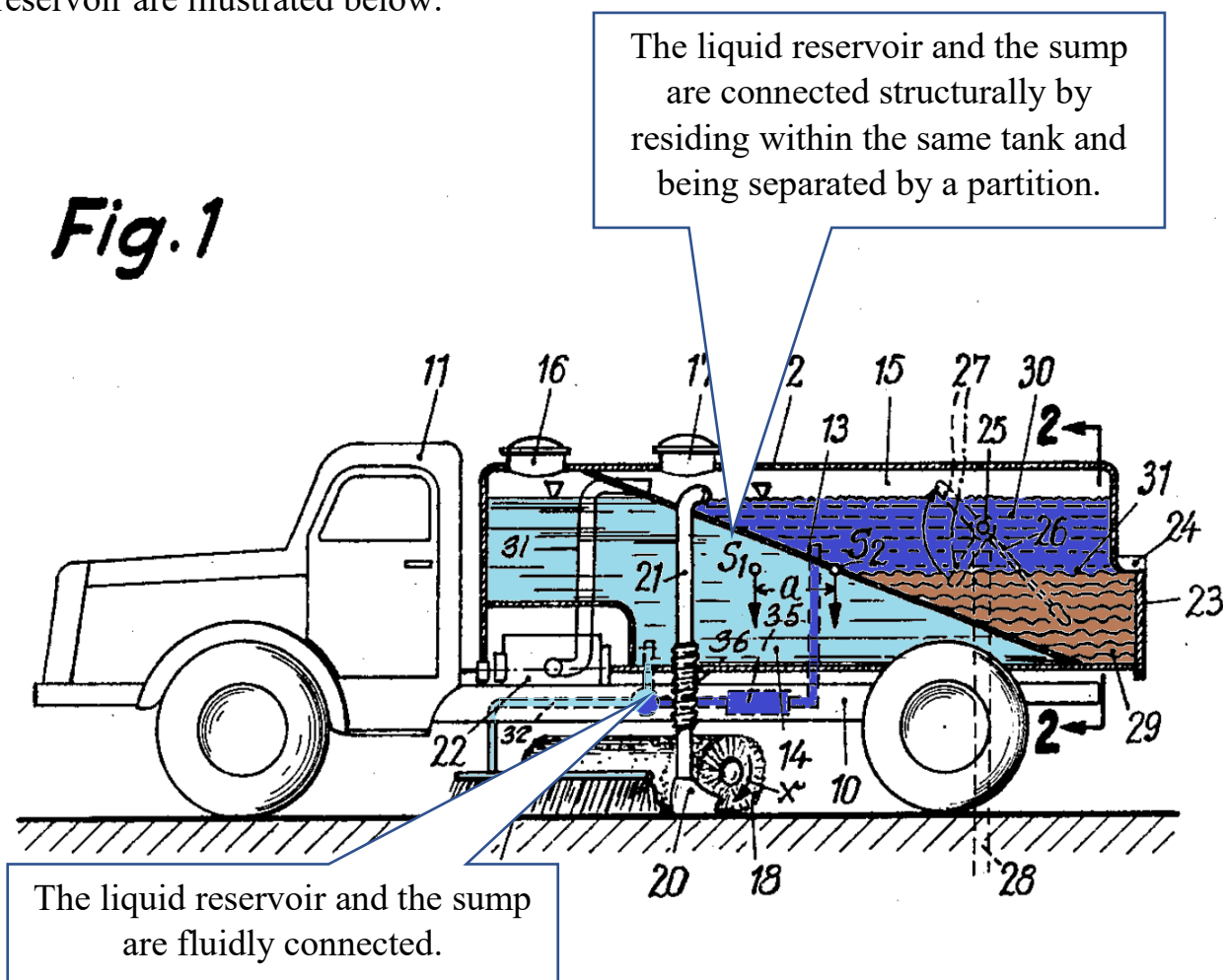


Blasters-1002 at FIGS. 3 and 6 (annotated)

When the cleaning system of Jones is modified in view of Breither, the vacuum tank of Jones is replaced with the “mud container” (*i.e.*, sump) disclosed in Breither. *See supra* Part VIII(B)(4). In this combination, the waste removal hose of Jones is fluidly coupled to the sump and is used to convey spent liquid and removed foreign matter to the sump. *Id.* Thus, Jones in view of Breither renders obvious “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”

Breither discloses a partitioned tank 12 divided into a fresh-water container (i.e., liquid reservoir) and a mud container (i.e., sump). *See* Blasters-1003 at 2:21-35. Breither further discloses that the sump is fluidly connected to the liquid reservoir such that “the fresh water remaining in container 14 or the soiled water from container 15 [can] be used alone or [can] be mixed with each other.” *See id.* at 3:73-75. Both the fluid and mechanical connections between the mud container and liquid reservoir are illustrated below:

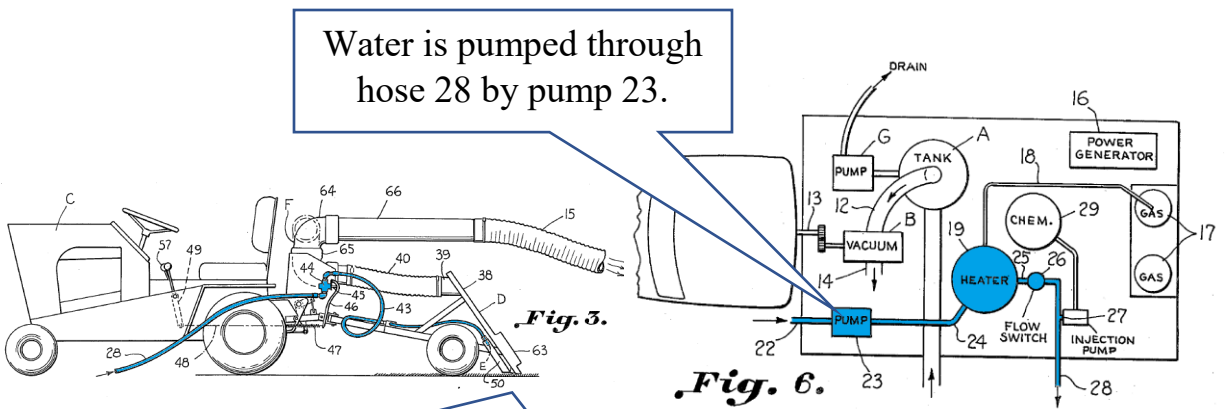


Blasters-1003 at FIG. 1 (annotated)

Thus, tank 12 of Breither has “said sump connected to said liquid reservoir.” As established in Part VIII(B)(4), *supra*, when improving the cleaning system disclosed in Jones in view of Breither, a POSA would mount tank 12 of Breither onto the service truck of Jones. Blasters-1009 at ¶ 86. Thus, Jones in view of Breither renders obvious “said sump connected to said liquid reservoir.” *Id.* at ¶ 87.

- 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”

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.” *See* Blasters-1002 at 2:57-62. Jones further discloses that the “pressurized water flow[s] through the hose 28” “to the cleaning head D.” *See id.* at 3:3-4, 2:65-68. Hose 28 connects to sprayer means E having a plurality of spray nozzles 42, from which the pressurized liquid is sprayed onto the surface being cleaned. *See id.* at 3:36-37, FIG. 3. FIGS. 3 and 6 of Jones illustrate the pressurized water delivery system, which is emphasized in blue:



Pressurized liquid is delivered to spray nozzles 42 via hose 28. The liquid is sprayed from the spray nozzles onto the surface being cleaned.

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

As established in Part VIII(B)(4), *supra*, when Jones is combined with Breither, the fresh-water reservoir of Breither becomes the source of the water being fed into the pressure booster pump of Jones. Blasters-1009 at ¶ 89. Thus, when Jones is combined with Breither, in the resulting system, the water is pumped from the fresh-water reservoir through the high-pressure hose and into the spray nozzles, from which the pressurized water exits onto the surface being cleaned. *Id.* Furthermore, it would have been obvious for a POSA to modify the combination of Jones and Breither with NLB's hose and nozzles designed for "ultra-high pressure." *Id.* at ¶ 90; see also Part VIII(B)(4), *supra*. Thus, the combination of Jones, Breither, and NLB renders obvious 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." Blasters-1009 at ¶ 90.

- 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”

Jones discloses that “the used cleaning medium and foreign matter [are] removed from the turf” and that “[t]he vacuum tank A is ... provided for receiving the spent cleaning solution.” Blasters-1002 at 2:28-29. Jones discloses that a vacuum pump is connected to the vacuum tank: “[c]ommunicating with the top of the vacuum tank B is a vacuum hose 12, which extends to the input of the vacuum pump B.” Blasters-1002 at 6:15-16; 2:28-32. Jones also teaches the waste removal hose that conveys the removed liquid and foreign matter to the vacuum tank: “[c]ommunicating 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.” *Id.* at 2:41-43. These components are depicted in FIG. 6 of Jones, which is reproduced and annotated below:

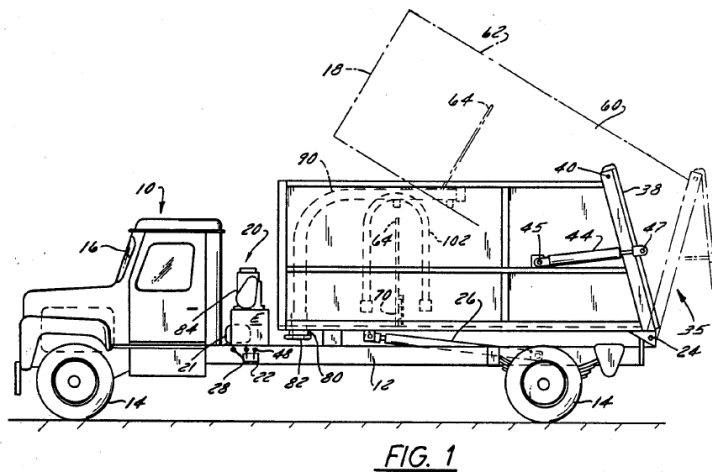
As established in Part VII(H), *supra*, a “mobile frame” is a “base frame of a motor vehicle or other wheeled conveyance.” With respect to the term “mounted,” a POSA would have understood this term to mean directly or indirectly attached. Blasters-1009 at ¶ 94. Therefore, the above limitation requires that the liquid reservoir, the sump, and the high power vacuum pump are directly or indirectly attached to a base frame of a motor vehicle.

Jones discloses a service truck, which has a base frame carrying the vacuum tank and the vacuum pump. *See* Blasters-1002 at FIG. 6. Breither discloses “a truck having a chassis 10, and a tank 12 mounted thereon behind driver’s cab 11,” wherein tank 12 includes both a liquid reservoir and a mud container (*i.e.*, sump). Blasters-1003 at 2:21-35. Breither further clarifies that the vacuum pump is mounted on the chassis (*i.e.*, a mobile frame). *Id.* at 2:53-55.

In the combination of Jones and Breither, the vacuum tank of Jones is replaced with tank 12 of Breither. *See supra* Part VIII(B)(4). “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.” Blasters-1009 at ¶ 100. 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. *Id.* at ¶ 101; *see also supra* Part VIII(B)(4). Therefore, the combination of Jones, Breither, and NLB renders obvious “said liquid reservoir,

said sump and said high power vacuum pump being mounted on a mobile frame.”
Blasters-1009 at ¶ 101.

Should the Board construe the term “mobile frame” as requiring the frame to be movable (*i.e.*, pivotal) with respect to the truck, it would have been obvious to further combine Jones, Breither, and NLB with U.S. Pat. No. 4,975,205 (Sloan) to achieve this limitation. Sloan discloses a truck having a sump mounted onto a “tiltable dump body.” Blasters-1007 at Abstract; FIG. 1.



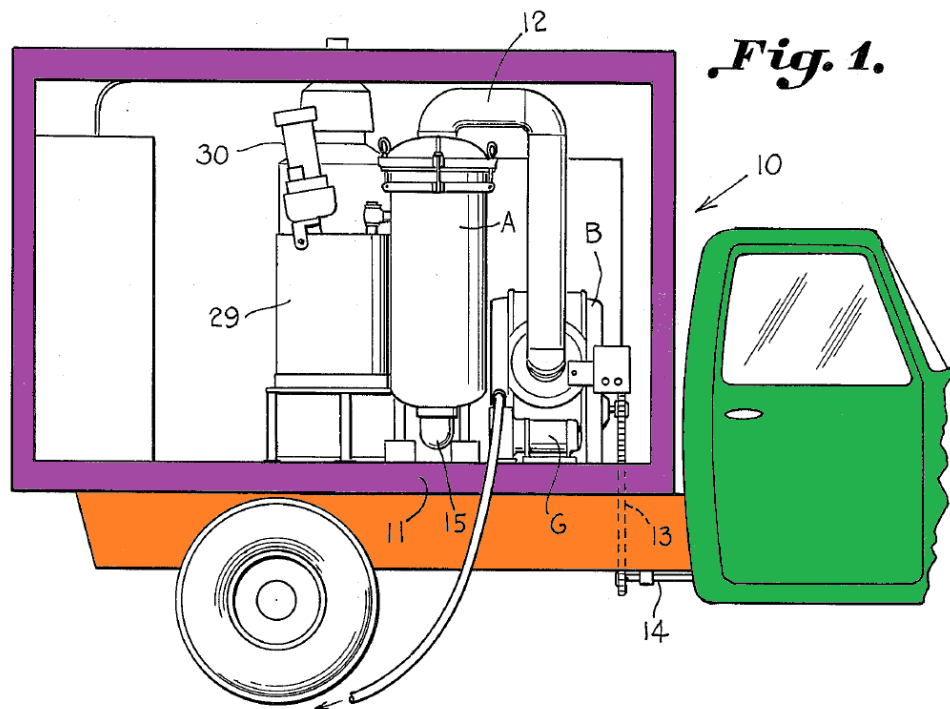
Blasters-1007 at FIG. 1

It would have been obvious to improve the truck disclosed in Jones with a tiltable frame disclosed in Sloan which would facilitate dumping out the contents of the sump. Blasters-1009 at ¶ 103. This combination would result in tank 12 (containing the liquid reservoir and the sump) and the high-power vacuum pump

being mounted onto the tiltable frame of Sloan. *Id.* Such modification would have been straightforward, would not require undue experimentation, and would produce predictable results. *Id.*

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

Jones discloses a self-propelled truck having a cab portion (emphasized in green), a mobile frame (*i.e.*, chassis) (emphasized in orange), and a bed portion (emphasized in purple). Blasters-1002 at 2:17-23, FIG. 1; Blasters-1009 at ¶ 104-05.

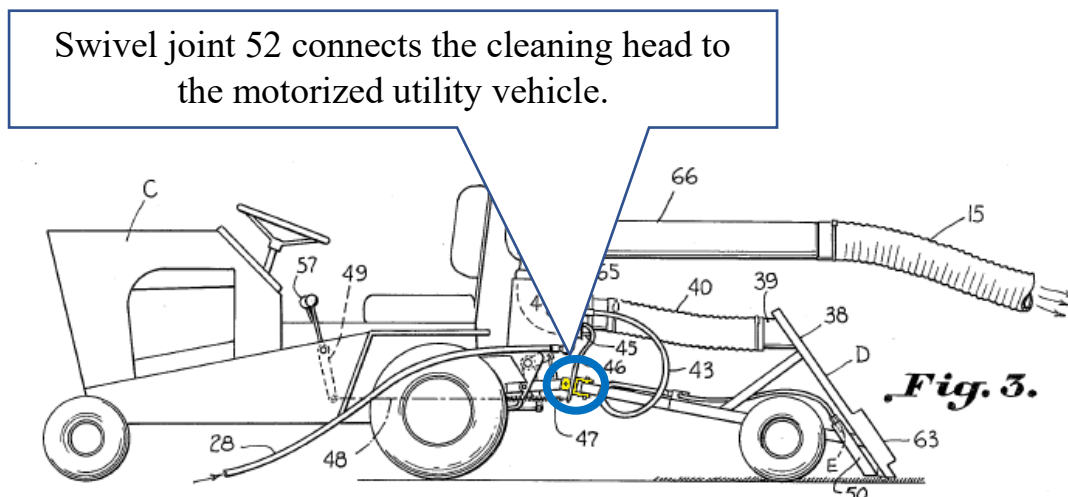


Blasters-1002 at FIG. 1 (annotated)

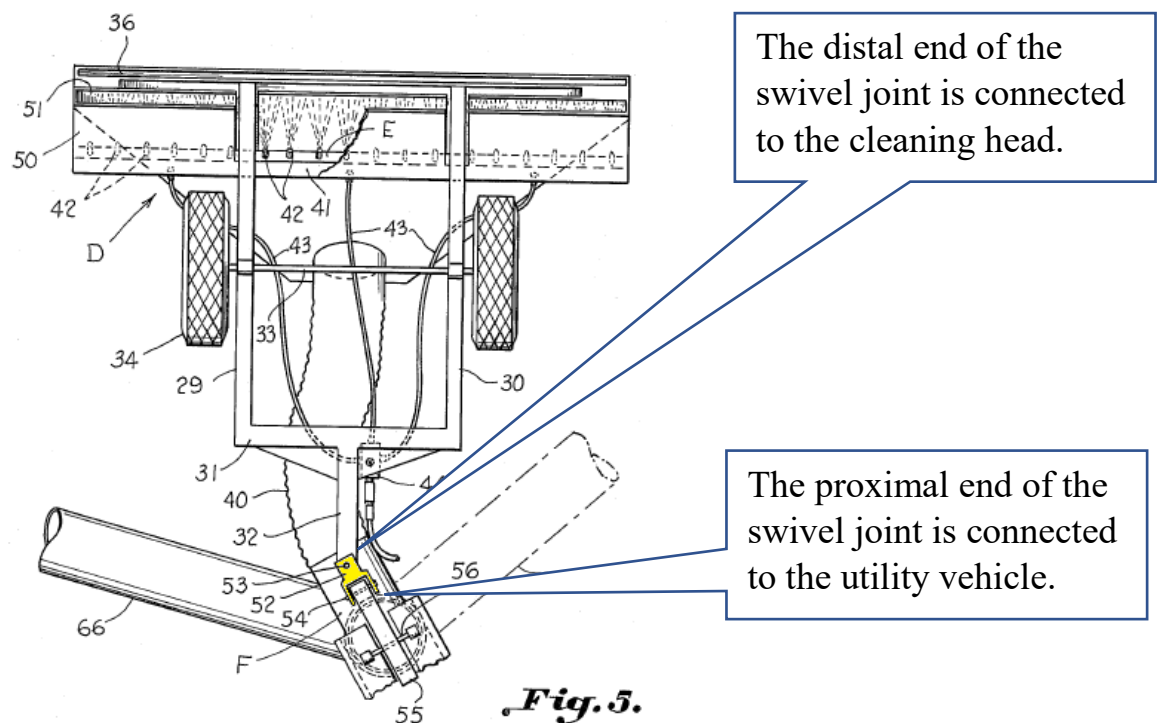
As established in the preceding section, the chassis is the base frame of the truck and, therefore, is an integral portion thereof. *See supra* Part VIII(B)(5)(i). Likewise, in the combination of Jones and Sloan discussed above, the “tiltable dump body” is also an integral part of the truck. Thus, the cited prior art 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”

Jones discloses “a swivel joint 52 which is pivotally connected by means of a bolt 53” and also “transverse pin 54.” Blasters-1002 at 3:64–68. As depicted below, the distal end of the swivel joint (emphasized in yellow) is connected to the cleaning head, and the proximal end is connected to the utility vehicle.



Blasters-1002 at FIG. 3 (annotated)



Blasters-1002 at FIG. 5 (annotated)

The swivel joint enables relative movement of the cleaning head with respect to the utility vehicle about bolt 53 and transverse pin 54. Blasters-1009 at ¶ 108. Thus, Jones teaches “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.” *Id.*

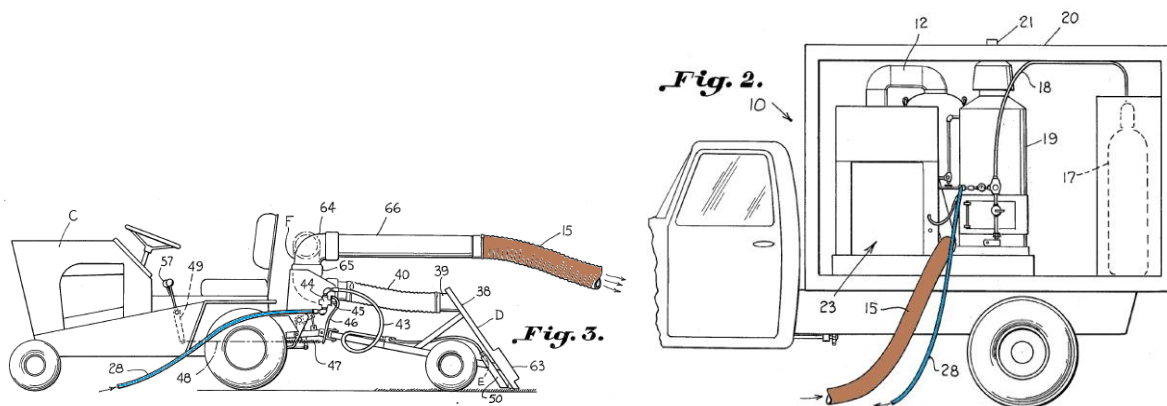
1. “said tractor including an engine for propulsion thereof”

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* . . .” See Blasters-1002 at 3:10-14 (emphasis added). The term “motorized” signifies that the utility vehicle has an engine for propulsion thereof. Blasters-1009 at ¶ 111. Thus, Jones teaches this limitation. *Id.*

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

Jones discloses vacuum hose 15 and water hose 28 extending from the utility vehicle to the service truck. See Blasters-1002 at 1:59-65; 2:65-68. When considered together, FIGS. 2 and 3 of Jones clearly illustrate the vacuum hose (emphasized in brown) and water hose (emphasized in blue) extending between the truck and the utility vehicle:



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

Furthermore, it would have been obvious to replace hose 28 of Jones with the hose disclosed in NLB, which is designed for “ultra-high pressure.” See *supra* Part

VIII(B)(4). Thus, Jones in view of NLB renders obvious this limitation of claim 1. Blasters-1009 at ¶ 114.

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

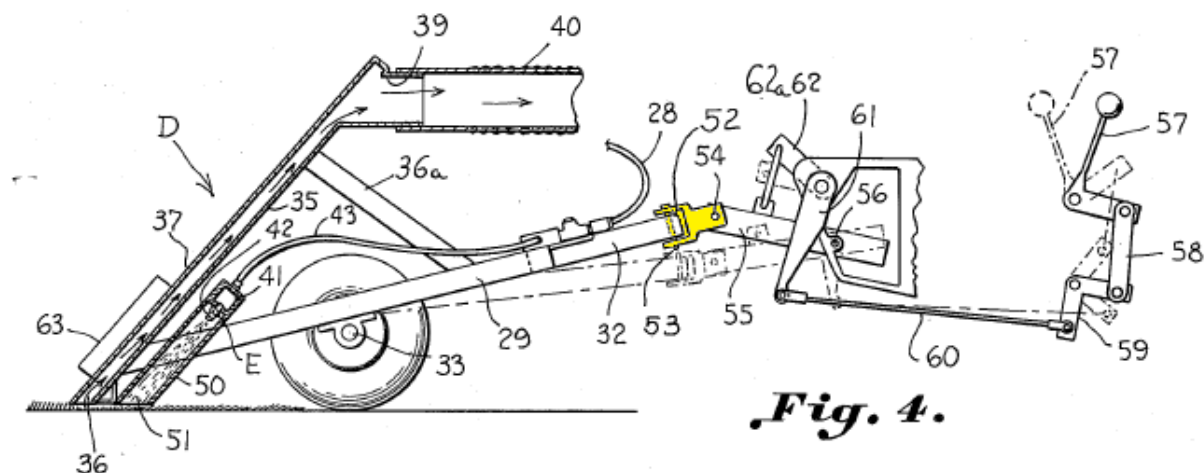
Jones discloses that “cleaning head ... is pulled behind a motorized utility vehicle.” *See id.* at Abstract. Because the cleaning head is connected to and pulled by the motorized utility vehicle, the utility vehicle dictates the path of the cleaning head. Blasters-1009 at ¶ 115. Thus, Jones teaches “whereby said tractor is utilized to maneuver said blast head.” *Id.*

6. Claim 2

Claim 2 of the ‘116 Patent depends from claim 1 and contains an additional limitation: “wherein a high power vacuum pump is connected to said sump.” Both Jones and Breither disclose this limitation. Jones discloses that “[a] vacuum pump B communicates with the tank A.” Blasters-1002 at 1:62-63. Breither discloses that vacuum “[p]ump 22 is connected by means of pipe 31 to the inside of mud container 15.” Blasters-1003 at 2:53-58. In the combination of Jones and Breither, the vacuum tank of Jones is replaced with the mud container (*i.e.*, sump) of Breither, and the vacuum pump is fluidly coupled thereto. *See supra* Part VIII(B)(4). Moreover, it would have been obvious to replace the vacuum pump of Jones with the NLB’s high power, 1,000 CFM vacuum pump. Blasters-1009 at ¶ 116. Thus, the combination of Jones, Breither, and NLB renders this limitation obvious. *Id.*

7. Claim 10

Claim 10 depends from claim 1 and introduces the following limitation: “said articulating link is constructed and arranged for controlled movement in a horizontal and a vertical plane.” Jones discloses swivel joint 52 which enables the cleaning head to move in a horizontal plane about bolt 53 and in a vertical plane about transverse pin 54. *See id.* at 3:64-66.



Blasters-1002 at Fig. 4 (annotated)

With respect to controlled movement in a vertical plane, Jones discloses a “mechanism for raising and lower[ing] the cleaning head D.” *Id.* at 3:63-64. This mechanism includes a linkage system connected to handle 57 positioned within the utility vehicle, thereby providing the driver with controlled movement of the swivel joint in the vertical plane. *See id.* at 4:7-16, FIG. 3.

With respect to movement in a horizontal plane, Jones discloses that swivel joint 52 can move about transverse pin 54. *Id.* at 3:67-4:2; Blasters-1009 at ¶ 117. The movement of swivel joint 52 in the horizontal plane is dictated by the path of the utility vehicle. *Id.* Thus, the driver of the utility vehicle controls the movement of the swivel joint in the horizontal plane by controlling the path of the utility vehicle. *Id.* 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.” *Id.*

Accordingly, Jones renders obvious “said articulating link [being] constructed and arranged for controlled movement in a horizontal and a vertical plane.”

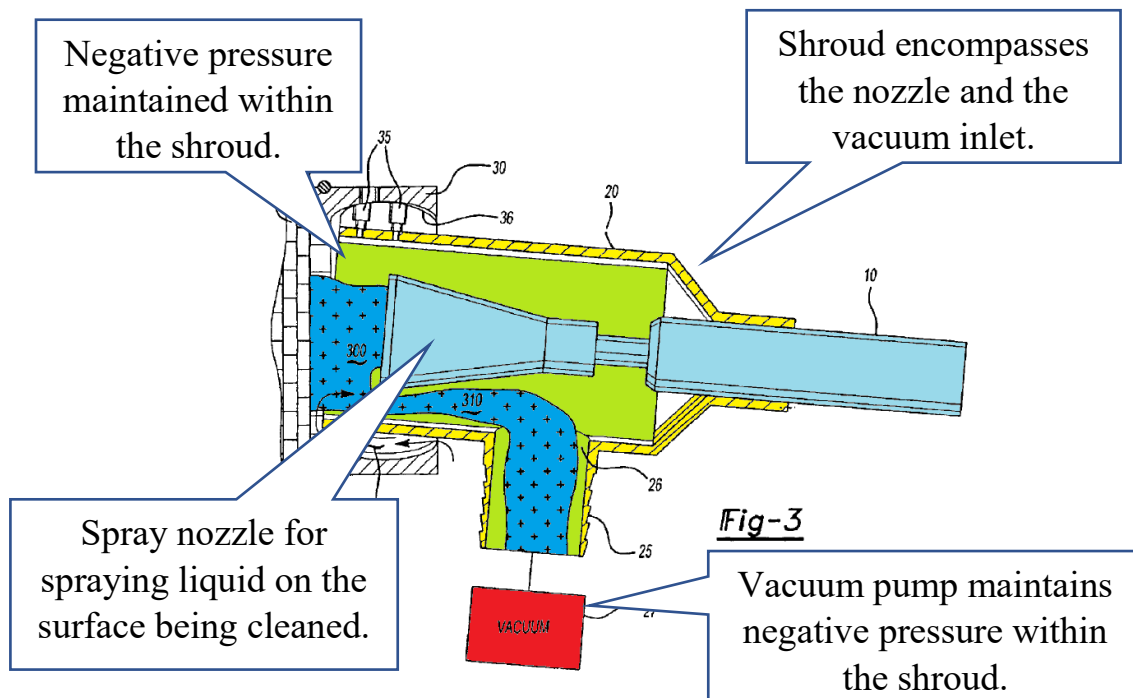
C. Ground 2: Claims 3 and 4 are obvious over the combination of Jones, Breither, NLB, and Herhold

1. Claim 3

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.” Although Jones does not expressly disclose a shroud, Jones in view of U.S. Pat. No. 6,889,594 (Herhold), filed January 31, 2003, teaches this limitation.

Jones discloses a cleaning head having spray nozzles and a suction nozzle. Blasters-1002 at 4:50-51. Like Jones, Herhold also discloses a cleaning head having spray nozzles and a vacuum inlet. Blasters-1004 at Abstract. Herhold further discloses a “shroud assembly ha[ving] a stationary tubular sleeve spaced generally circumferentially about the outlet nozzle,” wherein “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 (emphasized in yellow) surrounding the spray nozzle (emphasized in light blue) and having a vacuum source (emphasized in red) for maintaining negative pressure (emphasized in lime green) within the shroud:

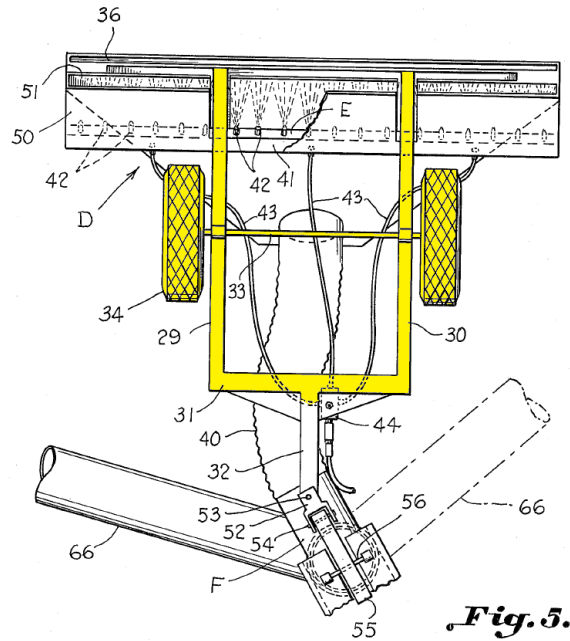


Blasters-1004 at FIG. 3 (annotated)

It would have been obvious to a POSA to improve the cleaning head disclosed in Jones by enclosing the spray nozzles and the suction nozzle within the shroud as disclosed in Herhold. Blasters-1009 at ¶ 121. Herhold provides an explicit motivation for this improvement by disclosing that a shroud having a negative pressure chamber is “effective in eliminating the chaotic discharge of elements from the outlet nozzle of the pressurized fluid spray device.” Blasters-1004 at 1:39-40. Addition of the shroud disclosed in Herhold to the cleaning head of Jones would have been straightforward, would not require undue experimentation, and would produce predictable results. Blasters-1009 at ¶ 121. Thus, Jones in view of Herhold renders obvious “a shroud [being] connected to said blast head, said shroud surrounds said at least one nozzle and forms a negative pressure chamber.”

2. Claim 4

Claim 4 of the ‘116 Patent requires that the “mobile blast head [be] attached to a wheeled chassis for maneuvering over the hard surface.” With respect to 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)

Thus, Jones teaches “said mobile blast head [being] attached to a wheeled chassis for maneuvering over the hard surface.”

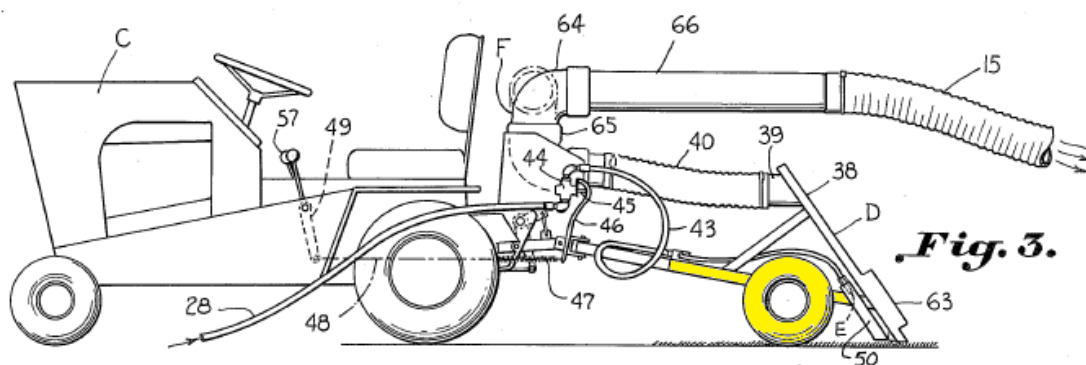
D. Ground 3: Claims 5 and 6 are obvious over combination of Jones, Breither, Herhold, and Schrunk

1. Claim 5

Claim 5 of the ‘116 Patent depends from claim 4 and further introduces two 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”

FIG. 3 of Jones discloses that the wheeled chassis (emphasized in yellow) of the cleaning head is attached to the motorized utility vehicle:



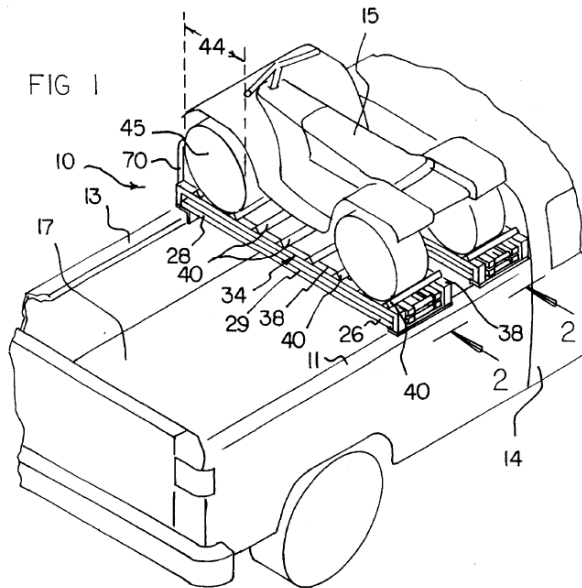
Blasters-1002 at FIG. 3 (annotated)

- 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

This limitation of claim 5 merely requires that the blast head and the tractor be “of a size” for removably docking transversely on a bed portion of a truck. Claim 5 does not specify any dimensions for the tractor, the blast head, or the bed portion of the truck. Blasters-1009 at ¶ 127. Claim 5 also does not recite any structural features required for transverse docking. *Id.* Thus, this limitation is rendered obvious by any tractor with an attached blast head, whose combined size enables them to be docked transversely on a bed portion of a truck. *Id.*

Jones explicitly states that “[t]he motorized vehicle C may be any suitable conventional utility vehicle” without imposing any minimum size requirements for the utility vehicle or the cleaning head. Blasters-1002 at 3:10-11 (emphasis added). The cleaning system disclosed in Jones is “portable” and requires contemporaneous presence of the service truck, the motorized utility vehicle, and the cleaning head. *Id.* at Abstract. These components are interconnected and must be deployed together. Blasters-1009 at ¶ 129. Thus, a POSA would be motivated to transport the service truck, the motorized utility vehicle, and the cleaning head to the work site as a cohesive unit. *Id.*

A POSA’s search for a suitable transportation solution would have led to U.S. Pat. No. 5,494,393 (Schrunk), issued February 27, 1996. *Id.* Schrunk discloses several advantages of transversely docking a motorized utility vehicle on a bed portion of a truck. Blasters-1005 at 1:50-60, 4:32-25. Schrunk explains that when the utility vehicle is docked transversely, it can be loaded and unloaded by moving exclusively in the forward direction, thereby obviating the challenges associated with unloading the utility vehicle in reverse. *Id.* at 4:32-35. FIG. 1 of Schrunk illustrates a motorized utility vehicle docked transversely on the bed portion of a truck:



Blasters-1005 at FIG. 1

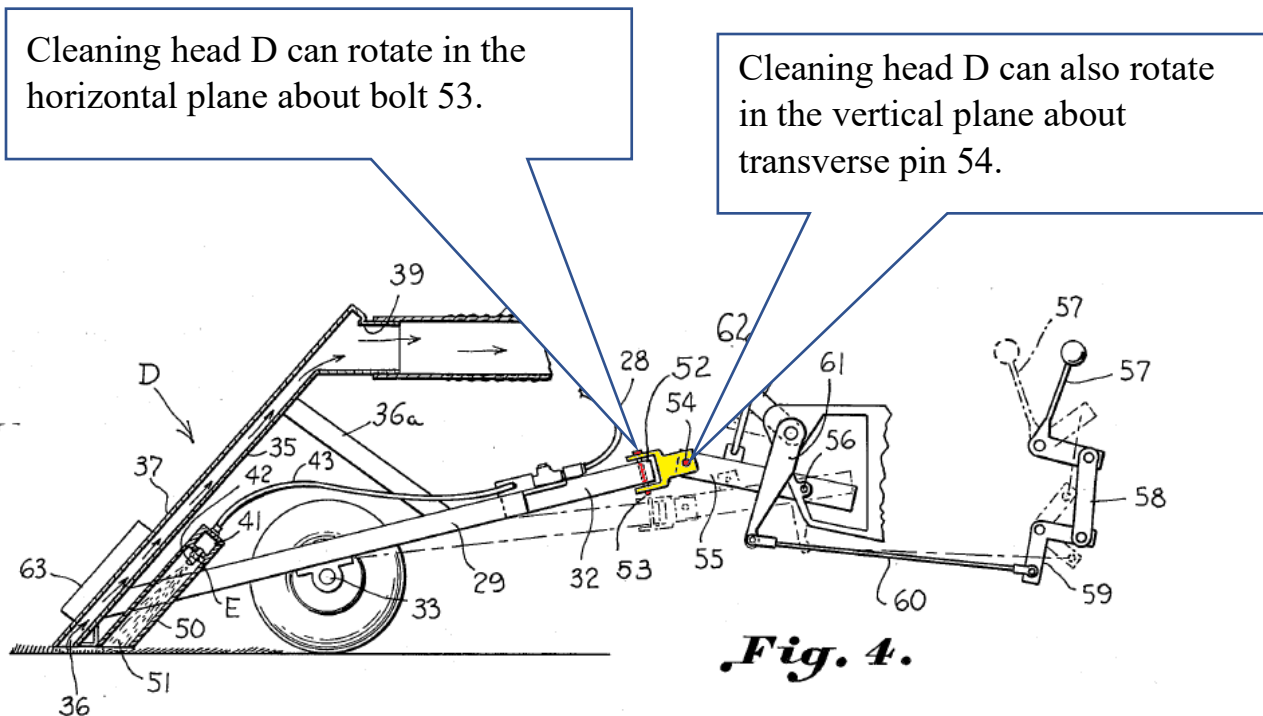
After learning about the advantages of transversely docking a utility vehicle on a bed portion of a truck, a POSA would be motivated to select the utility vehicle and the cleaning head of such sizes that would enable transverse docking on the bed portion of the support truck disclosed in Jones to achieve the benefits taught in Schrunk. Blasters-1009 at ¶ 131. From there, it would have been an obvious design choice to select the tractor and the blast head such that “said mobile blast head and tractor are of a size for removably docking transversely on said bed portion of said truck.” *Id.*; *See National Connector Corp. v. Malco Mfg. Co.*, 392 F.2d 766, 770 (8th Cir. 1968) (“As has been stated many times, changes of mere form, proportions or size will not sustain patentability”).

- ii. The swivel joint of Jones enables substantially the same space-saving configuration of the blast head as disclosed in the ‘116 Patent

The ‘116 Patent recites an objective of reducing the overall length of the tractor and blast head assembly to under 8’6”. Blasters-1001 at 2:41-49. The ‘116 Patent discloses that this objective can be achieved by transitioning the blast head into a space-saving configuration, in which the blast head is rotated in the vertical and/or horizontal planes. *Id.* The mechanical component that allows the blast head to transition into this space-saving configuration is the “articulating link,” which enables the blast head to move in both vertical and horizontal planes. Blasters-1009 at ¶ 133.

The ‘116 Patent discloses that the length of the tractor and blast assembly can be reduced by articulating the blast head in a vertical plane as follows: “blast head 23 may be raised to a vertical position and then manually flipped up and back reducing the overall length.” Blasters-1001 at 4:38-43. The ‘116 Patent discloses that the length of the blast head assembly can also be reduced by articulating the blast head in the horizontal plane: “when moved all the way to the right this also brings 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 does not disclose any other methods or structural components for reducing the length of the tractor and blast head assembly. Blasters-1009 at ¶ 136.

Like the '116 Patent, Jones also discloses that the cleaning head can rotate in both vertical and horizontal planes. Blasters-1002 at 3:63 – 4:18, FIGS. 4-5. As established in Part VIII(B)(7), *supra*, swivel joint 52 (emphasized in yellow) enables the cleaning head to rotate in the horizontal plane about bolt 53 (emphasized in red) and in the vertical plane about transverse pin 54 (emphasized in red). *Id.* at 3:63 – 4:3.



Blasters-1002 at FIG. 4 (annotated)

As the above annotations indicate, the cleaning head of Jones can be “flipped up and back” about the transverse pin 54 and can also be “moved all the way to the right” about bolt 53. Blasters-1009 at ¶ 135. Thus, swivel joint 52 of Jones enables the

position of the cleaning head to be adjusted in substantially the same manner as disclosed in the ‘116 Patent. *Id.*

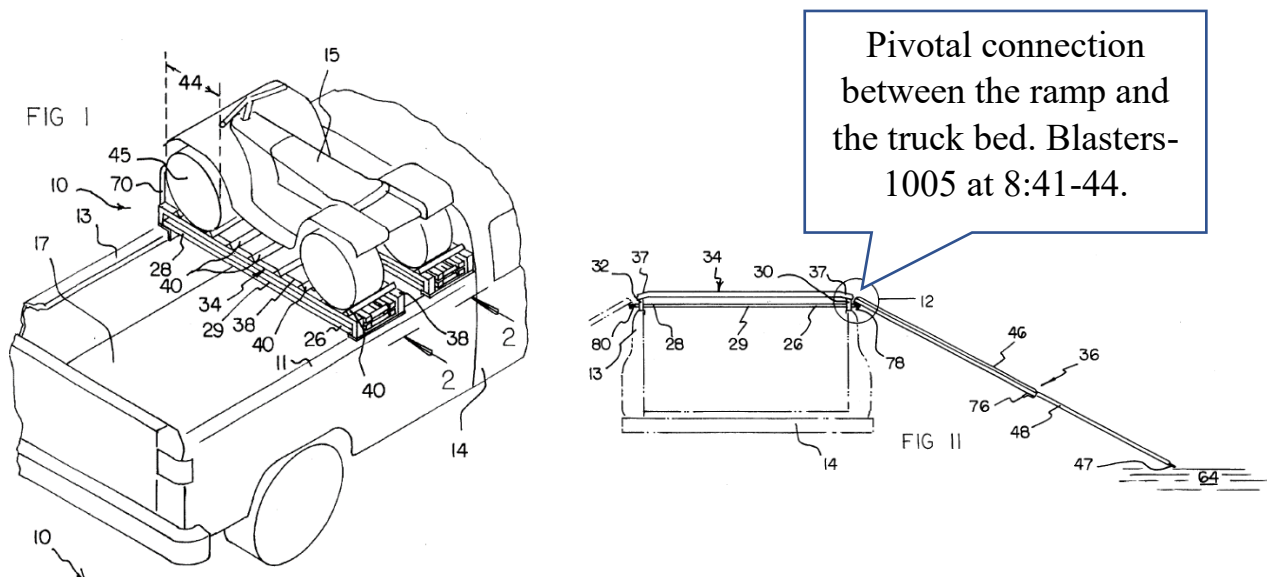
It would have been obvious to a POSA to adjust the position of the cleaning head of Jones to decrease the overall length of the blast head and the utility vehicle. *Id.* Schrunk provides an explicit motivation for transversely docking the utility vehicle on the truck, which would motivate the POSA to flip the blast head up and move it to a side, which would enable the utility vehicle and the blast head to fit transversely on the bed portion of the service truck. *Id.* Indeed, as discussed above, the ‘116 Patent itself discloses that when the blast head is “moved all the way to the right” and “flipped up and back,” the utility vehicle and the blast head can be docked transversely on the bed portion of the truck. *Id.* at 2:41-49; 4:38-42.

For this additional reason, Jones in view of Schrunk renders obvious “said mobile blast head and tractor [being] of a size for removably docking transversely on said bed portion of said truck.” *Id.*

2. Claim 6

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.” Schrunk discloses a retractable ramp pivotally connected to the bed of

the truck. Blasters-1005 at Abstract. To transition into the loading configuration, the ramp “is adapted to pivot downward” until its edge contacts the ground. *Id.* The utility vehicle can then be rolled up the ramp and transversely docked on the bed portion of the truck. *Id.* 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)

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 Schrunk. Blasters-1009 at ¶ 140. It further would have been obvious to select the bed portion of the truck such that there is sufficient space for mounting the ramp and docking the utility vehicle. *Id.* The motivation for mounting the ramp is stated in Schrunk: the ramp

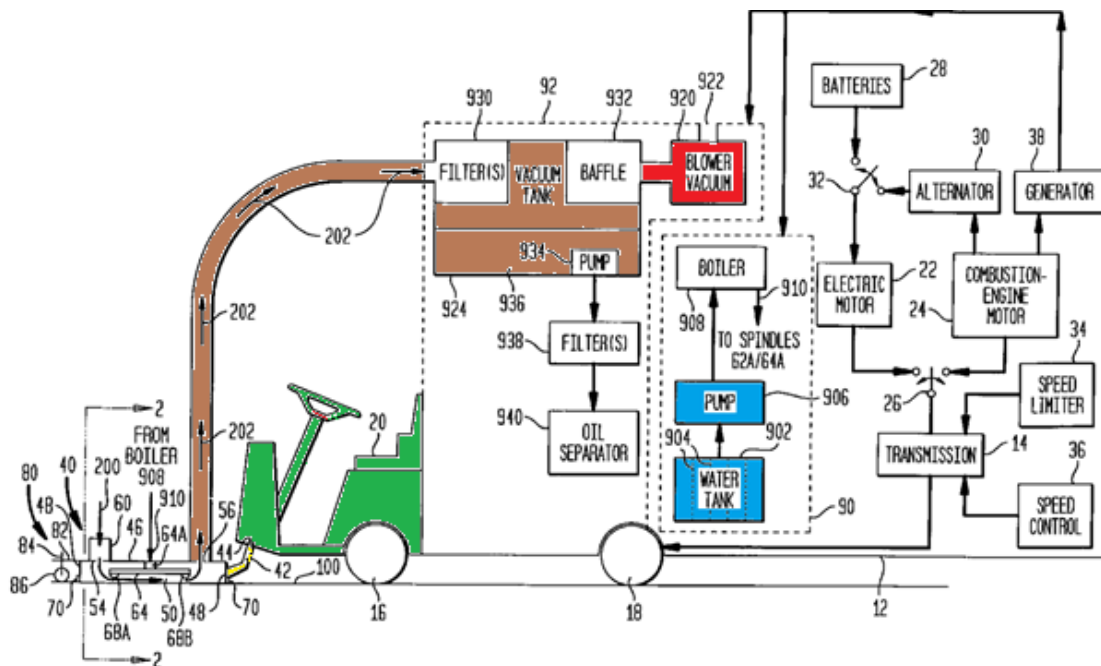
facilitates the ease of loading and unloading of the utility vehicle by enabling the vehicle to be rolled on and off the bed portion of the truck. Blasters-1005 at Abstract. Thus, Jones in view of Schrunk renders obvious “said bed portion includes a ramp, said ramp pivotally connected to said bed portion for raising and lowering said ramp, said ramp sized to support said tractor for docking transversely on said bed.”

E. Ground 4: Claims 1-4 are obvious based on Clemons in view of NLB

Claims 1-4 of the ‘116 Patent are obvious under 32 U.S.C. § 103 based on Clemons in view of NLB.

1. Overview of Clemons

Clemons discloses a cleaning system for removing debris from a hard surface, such as a runway or a street. Blasters-1008 at Abstract, 1:54-59. The system includes a cleaning head mounted onto the front of a self-propelled vehicle via a pivoting arm and a vacuum reclamation system for recovering the spent liquid and debris. *Id.* at Abstract, 3:36-38. Both the liquid delivery system and the vacuum recovery system are mounted on the vehicle frame and are fluidly coupled to the cleaning head. *Id.* at 4:46-48.



Blasters-1008 at FIG. 1 (annotated)

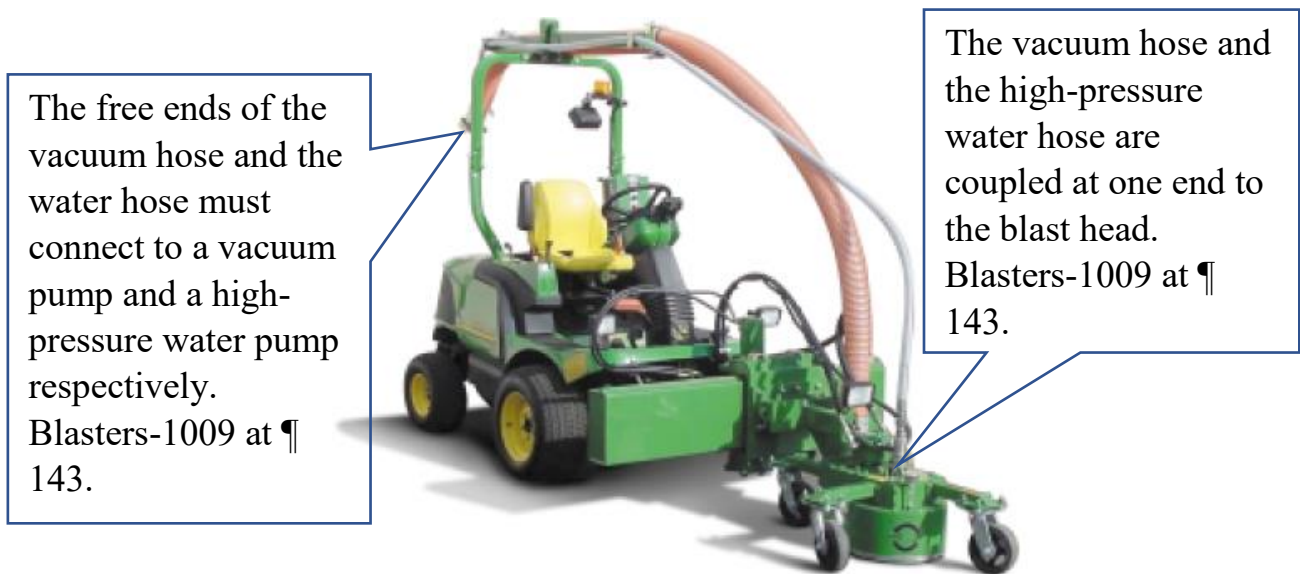
2. Overview of the combination of Clemons and NLB

Clemons and NLB are from the same field of endeavor: water jet cleaning. Blasters-1009 at ¶ 142. Both systems employ pressurized water to remove coatings from a hard surface and utilize a vacuum recovery system to remove spent liquid and dislodged coatings. Blasters-1008 at Abstract, 1:60-63; Blasters-1006 at 2.

One shortcoming of the cleaning system disclosed in Clemons is the inability of a large vehicle to efficiently clean areas with limited access or areas that need a vehicle with a tight turning radius. Blasters-1009 at ¶ 143. A POSA would have understood that the cleaning system of Clemons can be improved by inclusion of a secondary “compact and maneuverable” utility vehicle, such as the StripeJet™ tractor disclosed in NLB, which is specifically designed to clean “areas with limited

access (e.g., parking lots, garages, intersections).” Blasters-1006 at 4, 5; Blasters-1009 at ¶ 143-44.

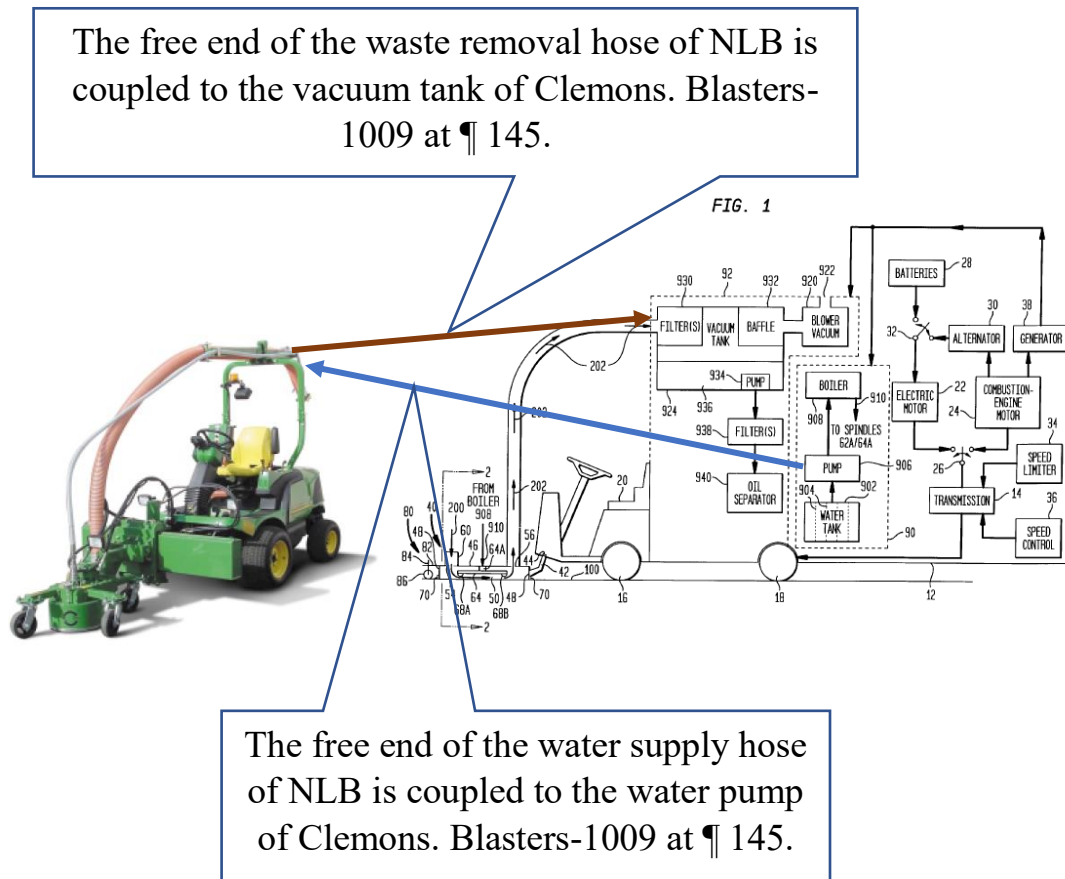
NLB discloses that the StripeJet™ system has a high-pressure nozzle assembly and a vacuum recovery system. Blasters-1006 at 4. NLB depicts the StripeJet™ system having a vacuum hose and a high-pressure water supply hose. *Id.*; Blasters-1009 at ¶ 143. One end of each hose is coupled to the blast head, while the other end is shown as free. Blasters-1006 at 4, Blasters-1009 at ¶ 143. The free end of the vacuum hose must be connected to a vacuum tank, and the free end of the high-pressure water hose must be connected to a high-pressure water pump to achieve a complete, functioning cleaning system. *See* Blasters-1006 at 2 (stating that a complete cleaning system has “a patented rotating nozzle assembly, ... [a] pump unit, water tank, and optional vacuum recovery to contain water and debris”); Blasters-1009 at ¶ 143.



Blasters-1006 at 4 (annotated)

Thus, the StripeJet™ of NLB readily avails itself for being combined with the cleaning system disclosed in Clemons, which teaches a truck carrying a vacuum tank coupled to a vacuum pump and a water tank coupled to a high-pressure pump. Blasters-1008 at FIG. 1. Combining these two cleaning systems would have been well within the ordinary skill in the art. Blasters-1009 at ¶ 144-46. In this combination, the free ends of the water and vacuum hoses of StripeJet™ system disclosed in NLB are coupled to Clemons's water pump and vacuum tank, respectively, thereby tethering the tractor of NLB to the truck of Clemons. *Id.* at ¶ 145. The simple arrangement of common components with each performing its known function as expected from such an arrangement, is an obvious combination. *See Apple Inc.* at 1072.

The cleaning system achieved by Clemons in view of NLB is illustrated below:



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

This improved system of Clemons combined with NLB would remain self-contained and operable by a single person, thereby meeting key objectives of Clemons and NLB. Blasters-1009 at ¶ 142. Furthermore, for the same reasons explained in Part VIII(B)(4), *supra*, it would have been obvious to further improve the cleaning system of Clemons in view of NLB by replacing the vacuum pump, the

water pump, the water supply hose, and the spray nozzles of Clemons with the high-power, 1,000 CFM vacuum pump and “ultra-high pressure” water pump, water supply hose, and spray nozzles of NLB, which are specifically designed for pressure of up to 40,000 psi. Blasters-1006 at 2, 4; Blasters-1009 at ¶ 147. This additional improvement would extend the capabilities of the cleaning system to a wider array of applications including “[f]loor coating removal.” Blasters-1005 at 4, Blasters-1009 at ¶ 147.

3. Claim 1

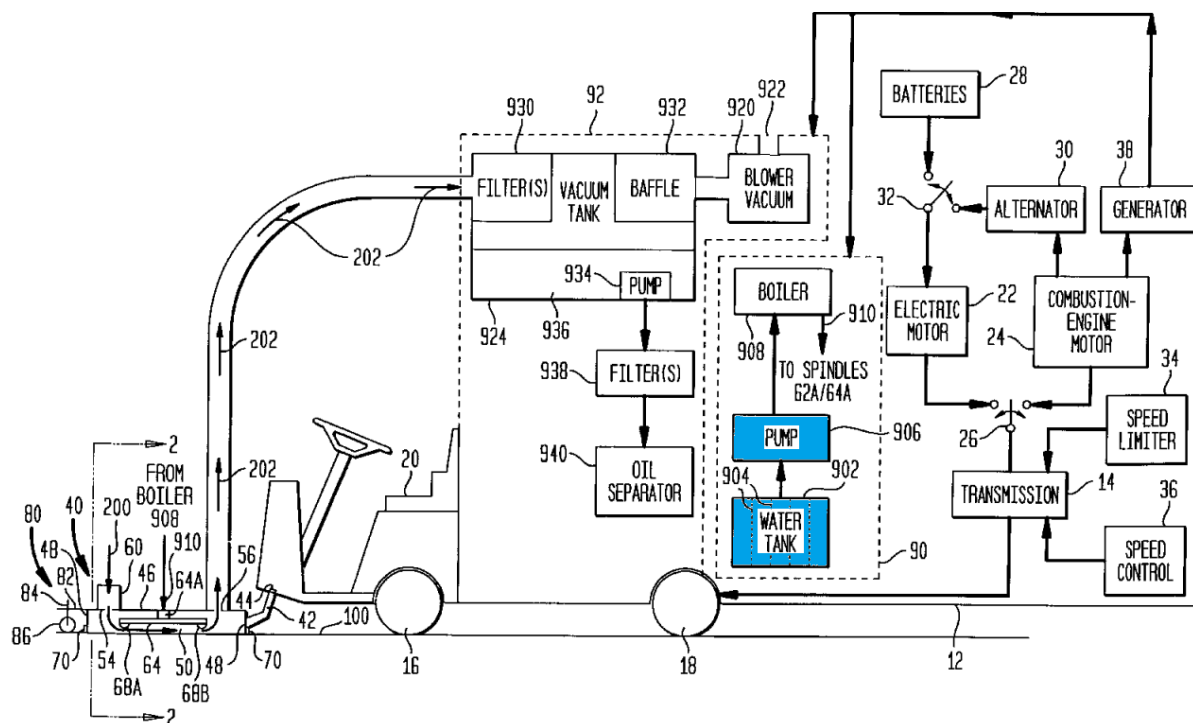
a. A cleaning system for removing coatings from a hard surface by high pressure liquid

Clemons discloses a cleaning system for removing foreign matter from hard surfaces, such as “runways, streets, sidewalks, parking surfaces, decks of ships and industrial floor areas.” Blasters-1008 at Abstract; 1:54-59; 2:64-3:4. Clemons discloses that “pressurized water loosens solid debris and other contaminants from [the] surface” and that desirable results were obtained using a high-pressure water at 4,000 psi. Blasters-1008 at 5:58-59; 6:12-17. Furthermore, as established in Part VIII(E)(2), *supra*, it would have been obvious to combine Clemons with NLB to achieve “ultra-high pressure water” of up to 40,000 psi to improve the cleaning system and extend its applications to “[f]loor coating removal.” Blasters-1006 at 2; Blasters-1009 at ¶ 149. Therefore, the combination of Clemons and NLB teaches “a

Blasters-1009 at ¶ 150.

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

As depicted below in annotated FIG. 1 of Clemons, Clemons discloses a cleaning system, in which a “high-pressure pump 102” (emphasized in blue) is coupled to “large water storage tank 902” (also emphasized in blue). *See also* Blasters-1008 at 4:57-58.

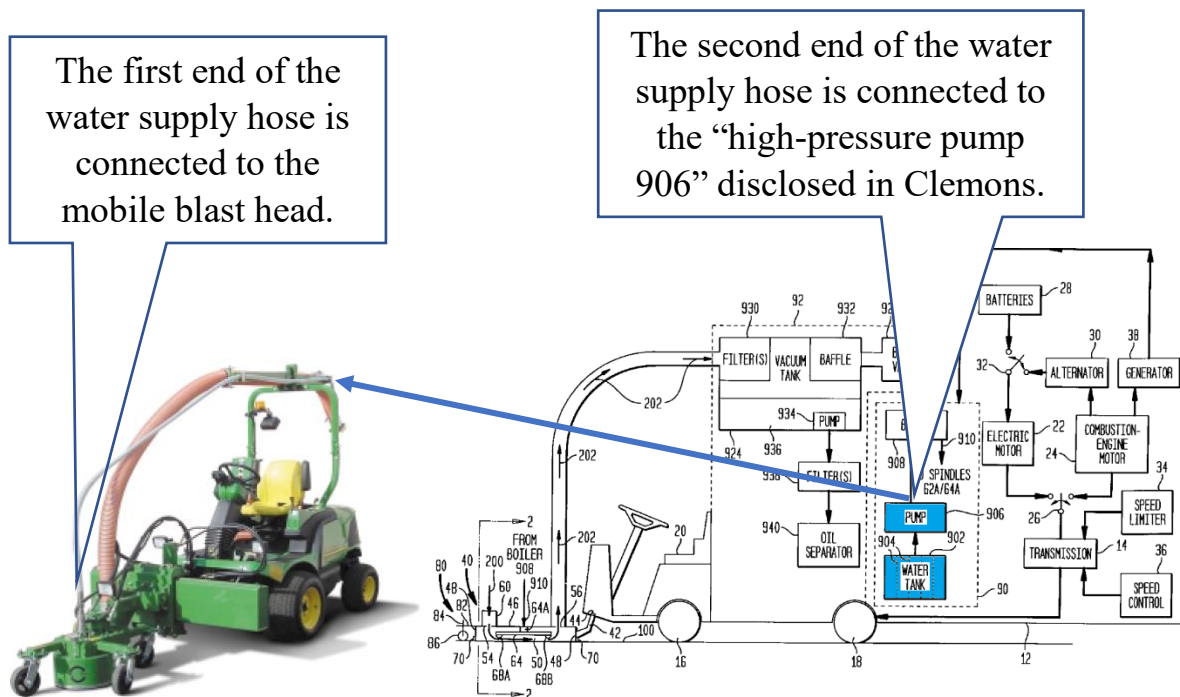


Blasters-1008 at FIG. 1 (annotated)

Thus, Clemons discloses “a liquid reservoir connected to a high pressure pump.”

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

Clemons discloses that “[c]oupled to cleaning head 40 [is] a liquid (e.g., water) delivery system” which is driven by a “high-pressure pump 906.” Blasters-1008 4:46-47; *Id.* 4:55-58. As established in Part VIII(E)(2), *supra*, “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; Blasters-1009 at ¶ 153. In the combination of Clemons and NLB, the water supply hose of StripeJet™ is coupled to the outlet of “high-pressure pump 906,” whereby the water supply hose delivers pressurized water from high-pressure pump 906 to the mobile blast head as illustrated below:



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

Furthermore, as explained in Part VIII(B)(4), *supra*, it would have been obvious to further improve the cleaning system of Clemons by replacing the high-pressure pump 906 with NLB's "ultra-high pressure," 40,000 psi pump. Blasters-1009 at ¶ 154; Balsters-1005 at 2. Although Clemons discloses that the pressurized water passes through a boiler prior to reaching the blast head, "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-1009 at ¶ 154; Blasters-1006 at 2. When modifying Clemons in view of NLB, it would have been obvious to simplify the resulting cleaning system by eliminating the boiler and directly coupling the water supply hose of StripeJet™ to the outlet of high-pressure pump 906 of Clemons. Blasters-1009 at ¶ 154; *Dystar* at 1651.

Thus, Clemons in view of NLB, renders obvious "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,

Both Clemons and NLB disclose blast heads having high-pressure nozzles. Clemons discloses a "cleaning head having a deck" and "a plurality of nozzles mounted to said deck ... [wherein] liquid under pressure is supplied thereto and sprayed therefrom." Blasters-1008 at 7:11-17. NLB discloses a "nozzle assembly" (*i.e.*, a blast head) having "up to 16 nozzles" for delivering ultra-high pressure water

Thus, the combination of Clemons and 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.” Blasters-1009 at ¶ 160.

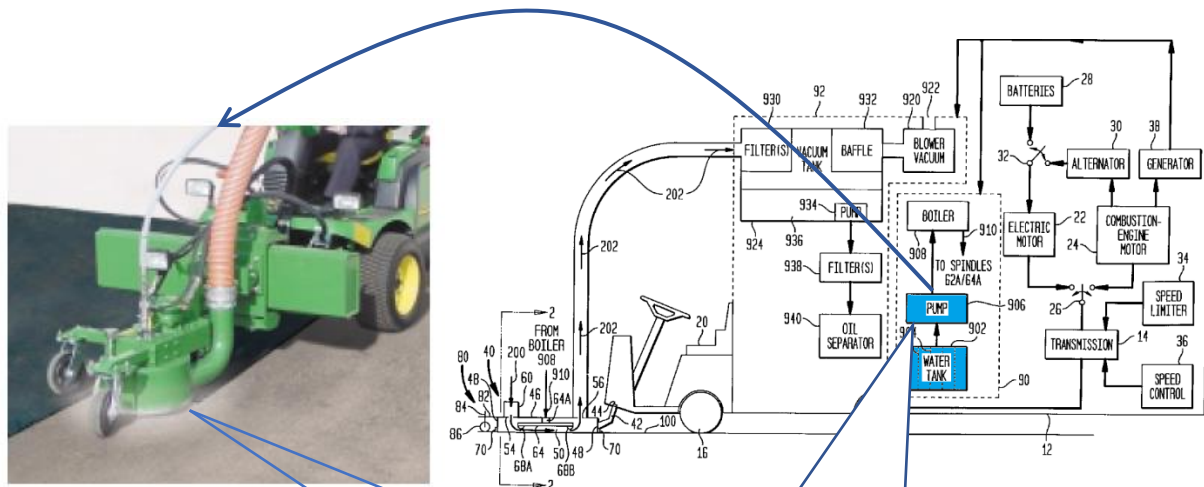
f. said sump connected to said liquid reservoir,

Clemons discloses that a “sump pump” disposed within the vacuum tank (*i.e.*, sump) pumps the recovered liquid and debris through a series of filters to produce “clean water that is returned to tank 902 for reuse in the cleaning process.” *Id.* at 5:12-20. Therefore, the vacuum tank and the water tank are fluidly connected. Blasters-1009 at ¶ 161. Thus, Clemons discloses “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,

Part VII(E)(3)(c), *supra*, established that the combination of Clemons and NLB teaches “said pump connected to a mobile blast head by a high pressure hose.” Clemons further discloses that “[a] high-pressure pump 906 is coupled to tank 902 to draw water therefrom.” Blasters-1008 at 4:57-59. Thus, 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-1009 at ¶ 162; Blasters-1006

at 2, 4. Thus, the combination of Clemons and NLB renders obvious this limitation of claim 1 as illustrated below:



High-pressure pump draws water from the water tank and supplies the pressurized water via a high-pressure hose to high pressure nozzles. *Blasters-1009 at ¶ 162.*

Blasters-1006 at 4 (annotated)

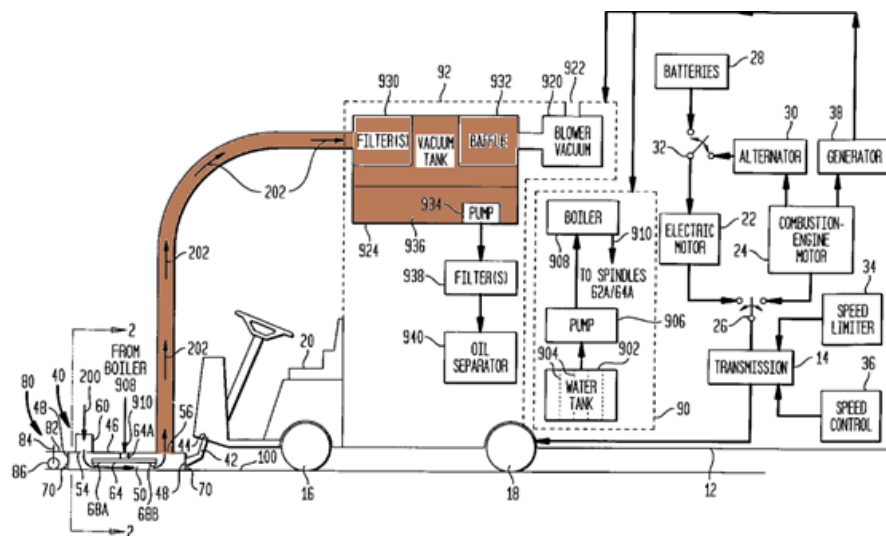
- h. said liquid and coatings conveyed through said waste removal hose to said sump via a high power vacuum pump,

Clemons discloses that a “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. As explained in part VII(E)(3)(c), *supra*, in the

modified cleaning system the vacuum pump of Clemons is replaced with the high power vacuum pump of NLB. The vacuum pump causes liquid and coatings to be conveyed through the vacuum hose from the blast head on the StripeJet™ to vacuum tank 924. Thus, the combination of Clemons and NLB discloses this limitation.

i. said coatings collected in said sump,

Clemons discloses that vacuum tank 924 (*i.e.*, the sump) has a filter 930 (emphasized in brown below) disposed therein and that “larger solid particles are trapped” within filter 930. Blasters-1008 at 5:10-11, 6:19-20, FIG. 1. Thus, Clemons discloses “said coatings collected in said sump.”



Blasters-1008 at FIG. 1 (annotated)

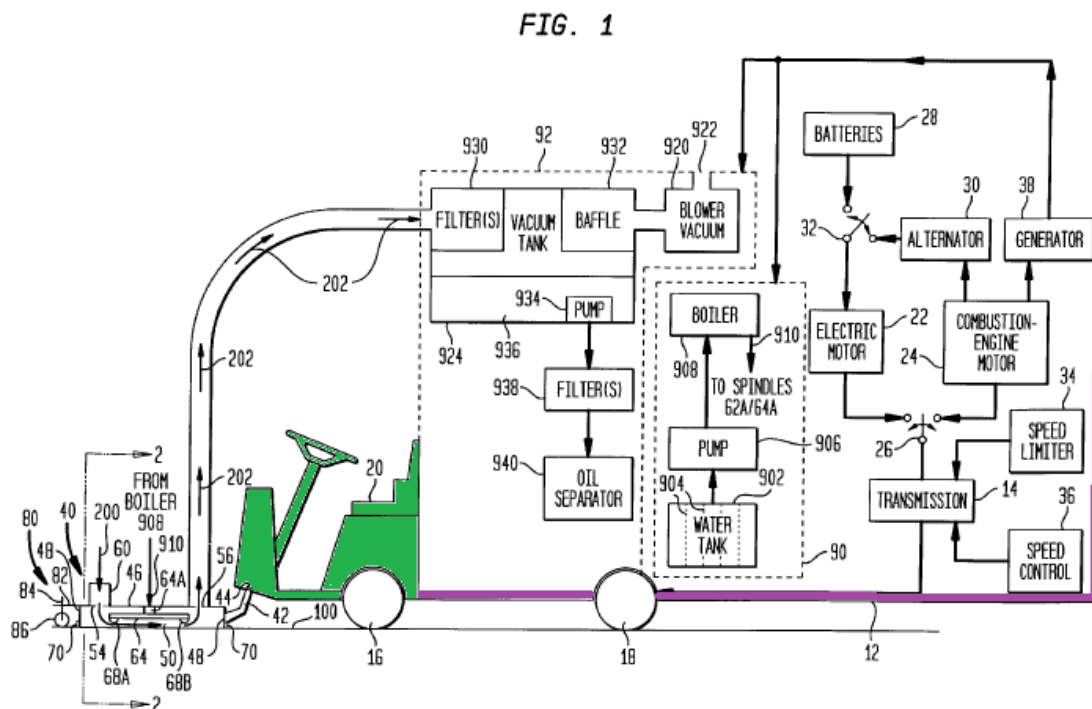
j. said liquid reservoir, said sump and said high power vacuum pump being mounted on a mobile frame,

As explained in part VII(H), a mobile frame is a base frame of a motor vehicle. Clemons discloses “a liquid (e.g., water) delivery system and a vacuum/recycling system, both of which are mounted on frame 12.” Blasters-1008 at 4:46-48. Frame 12 is the base frame of the Clemons truck; and the liquid delivery system includes the water tank, and the vacuum/recycling system includes the vacuum tank and the vacuum pump. *Id.* at 3:5-8, 4:55-58, 5:4-6, FIG. 1. Accordingly, Clemons discloses this limitation of claim 1.

Should the Board construe the term “mobile frame” as requiring the frame to be movable with respect to the truck, it would have been obvious to further combine Clemons and NLB with Sloan to achieve this limitation. As explained in part VIII(B)(5)(i), Sloan discloses a truck having a sump mounted onto a “tiltable dump body.” It would have been obvious to improve the truck disclosed in Clemons with the tiltable frame disclosed in Sloan to facilitate the dumping of the contents from the sump. Blasters-1009 at ¶ 167. This combination would result in the vacuum tank being moved to the rear of the truck and would have been accomplished via simple rearrangement of the components. *Id.* Such modification would have been straightforward, would not require undue experimentation, and would produce predictable results. *Id.*

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

FIG. 1 of Clemons illustrates a truck having a cab portion (emphasized in green) and a bed portion (emphasized in purple). Blasters-1009 at ¶ 168-70.



Blasters-1008 at FIG. 1 (annotated)

Clemons further discloses that “[s]urface cleaner 10 includes a self-propelled vehicle having a frame 12, a drive train coupled to frame 12.” Blasters-1008 at 3:5-8. Clearly, frame 12 is an integral part of the truck. Blasters-1009 at ¶ 168. Therefore, Clemons teaches “said mobile frame forming an integral part of a truck having a bed portion and a cab portion.”

1. 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

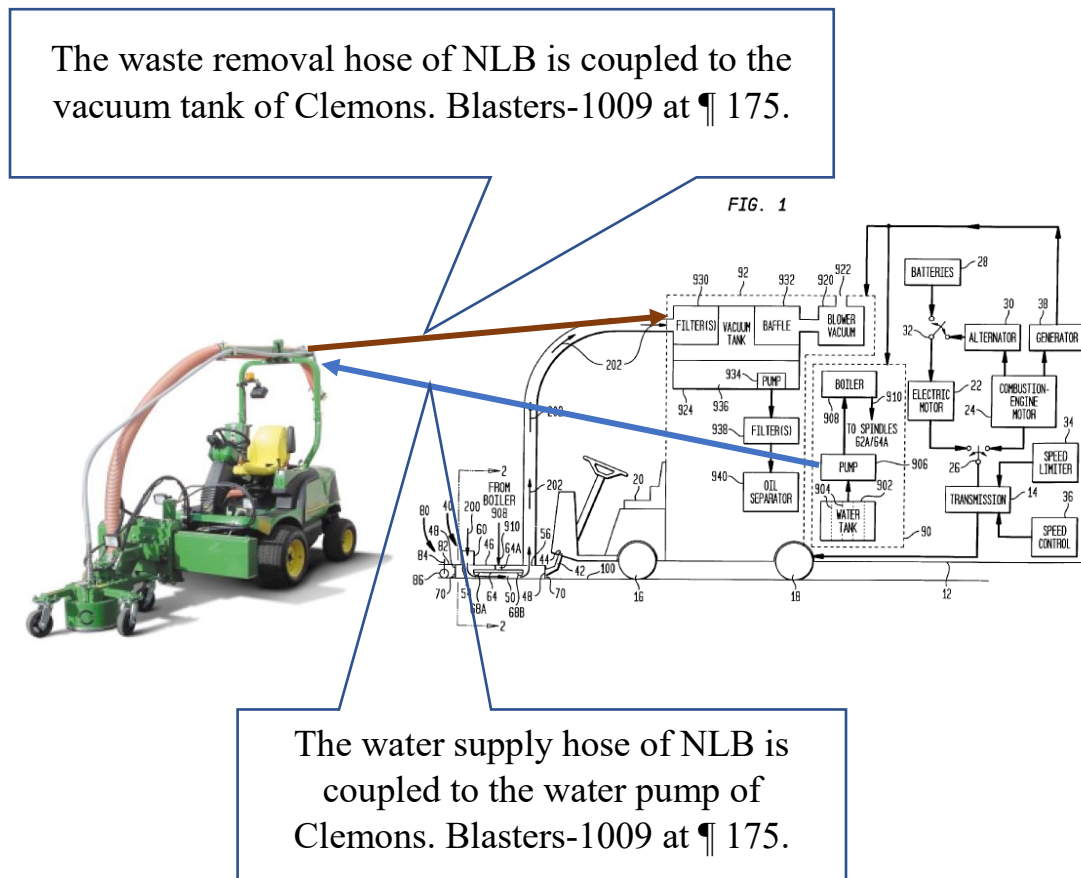
As established in Part VII(I), *supra*, “articulating link” should be construed as “a connecting structure that connects two parts in such a way as to permit relative movement.” Clemons discloses “an arm 42 pivotally attached to frame 12 at pivot point 44. Arm 42 can be manually pivoted or pivoted via 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.” Blasters-1008 at 3:36-41. Pivotal arm 42 of Clemons satisfies the “articulating link” limitation of claim 1. When combining Clemons with NLB, it would have been obvious to connect the blast head of NLB to the tractor of NLB using pivoting arm 42 of Clemons to enable the blast head to adjust the forward-to-rear pitch angle according to the teachings of Clemons. Blasters-1009 at ¶ 173. Such modification would have been straightforward, not requiring undue experimentation, and would produce predictable results. *Id.* Thus, the combination of Clemons in view of 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.” *Id.*

m. said tractor including an engine for propulsion thereof

The ‘116 Patent admits that the StripeJet™ system “is a self-propelled tractor.” Blasters-1001 at 2:5. NLB confirms that the StripeJet™ tractor has an engine and suggests that the engine is used for propulsion. Blasters-1006 at 4; Blasters-1009 at ¶ 174.

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

The '116 Patent admits that Petitioner had a prior art system having a tractor “connected to the prime-mover by high pressure lines,” evidencing that this limitation lacks novelty. *See* Blasters-1001 at 2:10-14. Indeed, as established in Part (VIII)(E)(2), *supra*, in the combination of Clemons with NLB, at one end, the vacuum and water supply hoses are coupled to the blast head, while at the other end, they are coupled to the vacuum tank and the water pump of Clemons, as illustrated below:



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

The simple arrangement of common components with each performing its known function as expected from such an arrangement, is an obvious combination. *See Apple Inc.* at 1072. Accordingly, the combination of Clemons and NLB renders obvious the limitation “wherein said high pressure hose and said waste removal hose extend between said truck and said tractor.” Blasters-1009 at ¶ 175-76.

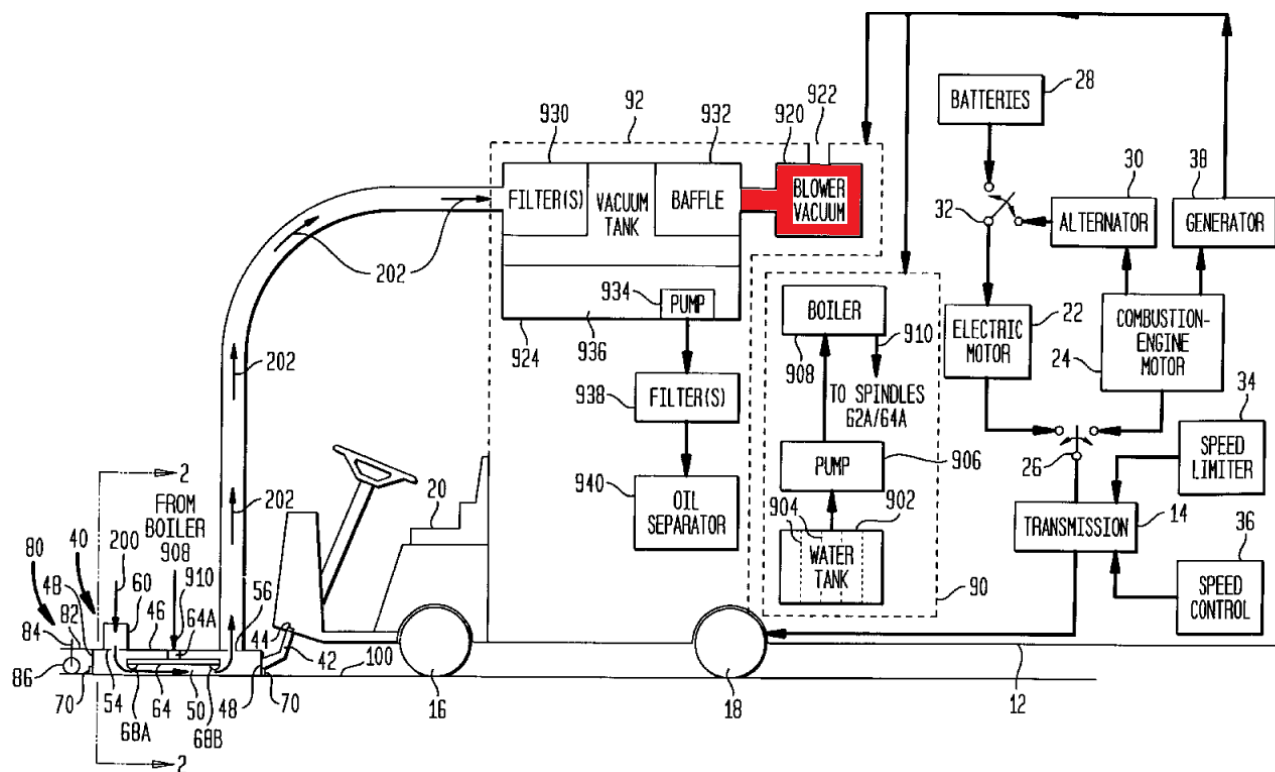
o. whereby said tractor is utilized to maneuver said blast head

NLB depicts the blast head secured to the tractor. Blasters-1006 at 1, 4, 5. Thus, a POSA would have understood that the tractor is utilized to maneuver the blast head. Blasters-1009 at ¶ 177. Therefore, NLB renders obvious this limitation.

Accordingly, the combination of Clemons and NLB teaches or suggests each and every limitation of claim 1 of the ‘116 Patent, thereby rendering claim 1 invalid as obvious under 35 U.S.C. § 103.

4. Claim 2

Claim 2 depends from claim 1 and recites an additional limitation requiring that “a high power vacuum pump is connected to said sump.” As depicted below, in annotated FIG. 1 of Clemons, blower vacuum 920 (emphasized in red) is connected to vacuum tank 924 (*i.e.*, the sump). Blasters-1008 at FIG. 1, 5:4-6.



Furthermore, it would have been obvious to improve the cleaning system achieved by the combination of Clemons and NLB by replacing the blower vacuum of Clemons with a high-power, 1,000 CFM vacuum pump of NLB. Blasters-1009 at ¶ 180. 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 would have more efficiently retrieved spent liquid and debris. *Id.* A POSA would be motivated to make this modification as it “results in a product or process that is more desirable, ... because it is stronger, ... faster, ... or more efficient.” *Dystar* at 1368. Accordingly, Clemons in view of NLB discloses the

limitation “a high power vacuum pump is connected to said sump” and, therefore, renders claim 2 obvious.

5. Claim 3

Claim 3 depends from claim 1 and further requires that “a shroud is connected to said blast head, said shroud surrounds said at least one nozzle and forms a negative pressure chamber.” The ‘116 Patent itself admits that the StripeJet™ has a blast head with a shroud. Blasters-1001 at 2:4-7. The NLB images confirm this admission. *See* Blasters-1006 at 1, 4, and 5.

Furthermore, with respect to the shroud, Clemons discloses the following:

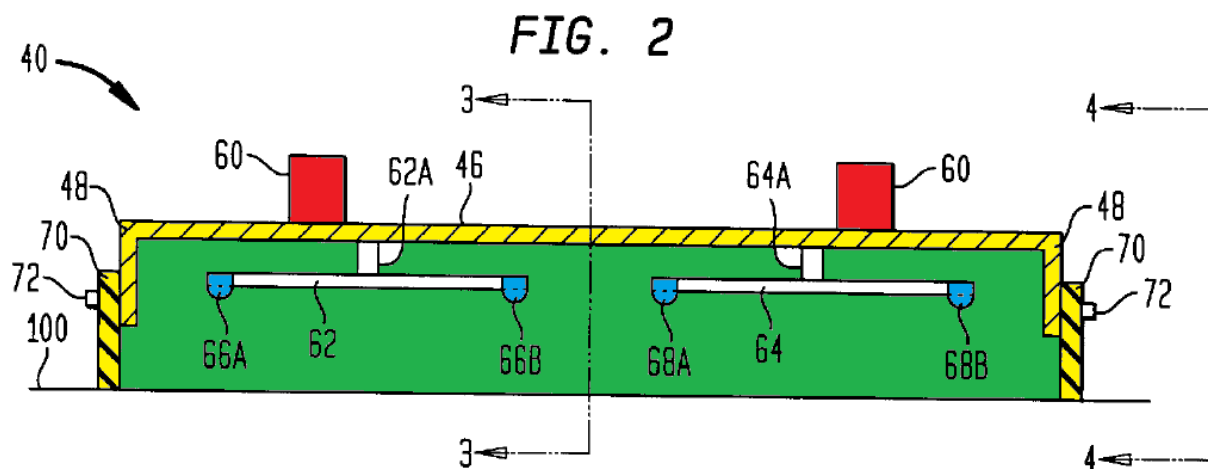
Cleaning head 40 is defined by an inverted tray shape having a top or deck 46 and a peripheral side skirt 48 that extends down from deck 46 when cleaning head 40 is positioned over surface 100 as shown. In use, when cleaning head 40 is placed in contact with surface 100, (*i.e.*, a sealing band 70 contacts surface 100), a cleaning volume 50 is defined by the volume of air space bounded by deck 46 on its top, skirt 48 (to include band 70) on its sides and surface 100 at its bottom.

Blasters-1008 at 3:41-50.

The term “shroud” is defined as “something that covers, screens, or guards.” *See* Blasters-1012. Thus, the “skirt” of Clemons is a “shroud.”

Clemons further discloses that “[a] plurality of nozzles are [sic] mounted for movement within the cleaning volume.” *Id.* at 2:22-23. In addition, Clemons discloses that “the suction force from [a] vacuum draws outside air into cleaning

volume 50 via duct(s) 60. The use of ducts 60 prevent water sprayed into cleaning volume 50 from escaping.” *Id.* at 5:61-64. Thus, as depicted in FIG. 2 of Clemons annotated below, Clemons discloses that the skirt (*i.e.*, shroud) (emphasized in yellow) surrounds a plurality of nozzles (emphasized in blue), and the vacuum pump coupled to ducts 60 (emphasized in red) creates a negative pressure chamber (emphasized in green) within the cleaning volume encompassed by the skirt:



Blasters-1008 at FIG. 2 (annotated)

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. Blasters-1009 at ¶ 184. The motivation for this combination is stated in Clemons: by employing a shroud creating a negative pressure chamber around the nozzles, the shroud “prevent[s] water sprayed into cleaning volume 50 from escaping

therefrom.” Blasters-1008 at 5:61-64. Thus, the combination of Clemons and NLB teaches all limitations of claim 3, thereby rendering claim 3 invalid as obvious under 35 U.S.C. § 103.

6. Claim 4

Dependent claim 4 requires that “said mobile blast head is attached to a wheeled chassis for maneuvering over the hard surface.” Indeed, the ‘116 Patent admits that NLB Corporation was already employing a system with the blast head attached to a wheeled chassis. *See* Blasters-1001 at 1:54-58. NLB corroborates this admission in the images of the StripeJet™, which clearly depict the blast head attached to a wheeled chassis. *See* Blasters-1006 at 1, 4, and 5; Blasters-1009 at ¶ 185.



Blasters-1006 at 4

Therefore, NLB teaches this limitation of dependent claim 4. Accordingly, the combination of Clemons and NLB renders claim 4 invalid for being obvious.

7. Claim 10

Dependent claim 10 requires that “said articulating link is constructed and arranged for controlled movement in a horizontal and a vertical plane.” As established in Part VII(D)(4)(m), *supra*, it would have been obvious to connect the blast head disclosed in NLB to the StripeJet™ tractor using the pivoting arm 42 (*i.e.*, articulating link) disclosed in Clemons. Clemons discloses that “[a]rm 42 can be manually pivoted or pivoted via a motorized force to raise/lower cleaning head 40.” Blasters-1008 at 3:38-41. Thus, the combination of Clemons and NLB teaches an articulating link designed for controlled movement in the vertical plane. Blasters-1009 at ¶ 186.

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-1009 at ¶ 187.



The blast head is depicted in a first position.



The blast head is depicted in a second position, wherein the blast has moved along the horizontal support member.

Blasters-1006 at 4 (annotated)

Accordingly, the combination of Clemons in view of NLB discloses all limitations of claim 10 rendering it invalid under § 103.

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

As explained in Ground 4, claims 1-4 of the '116 Patent are rendered obvious based on Clemons in view of NLB. Schrunk is incorporated in Ground 5 to prove that the limitations of claims 5 and 6 are also obvious and thus invalid.

As established in part VIII(D)(b)(i), *supra*, Schrunk first establishes that compact vehicles are often transported by other vehicles. Schrunk further discloses certain advantages of transporting a compact vehicle transversely on the bed portion

of a truck. *See id.* As explained in Parts VIII(E)(2), *supra*, a POSA would have been motivated to combine Clemons with the compact tractor in NLB to clean areas with limited access. Understanding that the cleaning system is intended to be a self-contained system, operable by a single user, a POSA would have further been motivated to stow the tractor on the bed portion of the Clemons truck to easily transport the system as a self-contained unit. Blasters-1009 at ¶ 191. When docking the tractor on the truck, a POSA would follow the teachings of Schrunk and would dock the tractor transversely on the bed portion of the to achieve the advantages disclosed in Schrunk. *Id.*

1. Claim 5

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

As depicted in the various images of the StripeJet™ in NLB, a support frame having wheels (*i.e.*, a wheeled chassis) is attached to the tractor. Blasters-1006 at 1, 4, and 5; Blasters-1009 at ¶ 193. Thus, 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

Claim 5 further requires that the combined size of the blast head and tractor allow the combination to be removably docked transversely on the bed of the truck. This claim, however, does not impose any structural limitations.

As explained in part VIII(D)(1)(b), *supra*, Schrunk discloses a vehicle of a size to be stowed transversely on the bed portion of a truck and enumerates advantages to transversely stowing the vehicle. In view of Schrunk, a POSA would be motivated to select a tractor and cleaning head of a size that would enable them to be transversely docked on the bed portion of the truck. Blasters-1009 at ¶ 195. NLB does not require that the tractor and blast head be of a certain size, but rather discloses that a “compact” vehicle is desirable for addressing areas of limited access. *See* Blasters-1006 at 5. The mere scaling of the blast head and the tractor would not have been uniquely challenging or difficult for a POSA. Blasters-1009 at ¶ 196. Accordingly, sizing the tractor and blast head to be loaded and stowed transversely on a truck is obvious in view of the prior art. *Id.*; *see Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007).

Even if the Board finds that claim 6 imposes a structural limitation on the blast head and the tractor, the combination of Clemons and NLB teaches mechanical components that provide the same size-conserving capabilities as disclosed in the ‘116 Patent. Blasters-1009 at ¶ 197. As explained in part VIII(D)(1)(b)(ii), *supra*, the ‘116 Patent discloses that an embodiment may include an articulating link

adapted to be “flipped up and back reducing the overall length to permit tractor 20 and blast head 23 to be stowed on a truck bed sideways.” Clemons discloses this same capability: “[a]rm 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.” *Id.* at 3:36-41. By pivoting up to increase the pitch angle, the overall length of the cleaning head and vehicle is reduced. Blasters-1009 at ¶ 197. Furthermore, a POSA would have been motivated to modify the articulating arm of 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. *Id.* at ¶ 198.

Thus, claim 5 would have been obvious over the cited prior art at least for two reasons. First, claim 5 does not impose *any* structural limitations on either the tractor or the blast head and instead only requires that they be “of a size” for transversely docking on a truck bed, which is a mere design choice. In view of Schrunk, it would have been obvious to a POSA to select a tractor and a cleaning head of such sizes as to enable transverse docking on the bed portion of the Clemons truck. Second, Clemons discloses a pivoting arm to manipulate the pitch 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. Thus, Clemons in view of Schrunk

teaches or suggests all limitations of claim 5. Accordingly, claim 5 is obvious and, therefore, invalid under § 103.

2. Claim 6

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.” As set forth in VIII(D)(2), *supra*, Schrunk discloses this limitation. A POSA would be motivated to combine Clemons with Schrunk to include a ramp for loading/unloading the tractor on the bed portion of the truck in Clemons. Blasters-1009 at ¶ 201. “Such modifications would also have been straightforward, not requiring undue experimentation, and would produce predictable results.” *Id.* Therefore, the combination of Clemons, NLB, and Schrunk teaches all limitations of claim 6, rendering claim 6 invalid as being obvious.

IX. CONCLUSION

For the reasons set forth above, Petitioner requests institution of an *inter partes* review with respect to claims 1-6 and 10 of the ‘116 Patent.

Respectfully submitted,
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CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that, in accordance with 37 C.F.R. § 42.24(d), this Petition includes a total of 15,586 words. Per 37 C.F.R. § 42.24(a), the total number of words excluding a table of contents, a table of authorities, mandatory notices under § 42.8, a certificate of service or word count, and appendix of exhibits is 13,969.

Date: January 15, 2018

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that, in accordance with 37 C.F.R. § 42.6(e), the above Petition and a copy of the incorporated exhibits were served in their entirety on January 15, 2018 upon the following via FedEx®:

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APPENDIX A—EXHIBIT LIST

Exhibit No.	Description
Blasters-1001	U.S. Patent No. 7,255,116 to Crocker (“the ‘116 Patent”)
Blasters-1002	U.S. Patent No. 3,902,219 to Jones (“Jones”)
Blasters-1003	U.S. Patent No. 3,011,206 to Breither (“Breither”)
Blasters-1004	U.S. Patent No. 6,889,914 to Herhold (“Herhold”)
Blasters-1005	U.S. Patent No. 5,494,393 to Schrunk (“Schrunk”)
Blasters-1006	NLB Corp. StripeJet™ Brochure (“NLB”)
Blasters-1007	U.S. Patent No. 4,975,205 to Sloan (“Sloan”)
Blasters-1008	U.S. Patent No. 6,381,801 to Clemons, Sr. (“Clemons”)
Blasters-1009	Expert Declaration in Support of Petition for <i>Inter Partes Review</i> of U.S. Patent No. 7,255,116
Blasters-1010	Definitions of Terms from Thefreedictionary.com
Blasters-1011	Definitions of Terms from Merriam-Webster Dictionary Online
Blasters-1012	Definitions of Terms from Merriam-Webster Dictionary
Blasters-1013	Definitions of Terms from Dictionary.com
Blasters-1014	Definitions of Terms from The Oxford Dictionary
Blasters-1015	Definitions of Terms from Chambers Dictionary of Science and Technology
Blasters-1016	Declaration of Christopher Butler
Blasters-1017	CV of Scott F. Boos