

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BLASTERS, INC.
Petitioner

v.

WATERBLASTING, LLC
Patent Owner

Case IPR2018-00504

Patent 7,255,116

DECLARATION OF DR. RANDALL K. KING, Ph.D., P.E.

IN SUPPORT OF

PETITION FOR *INTER PARTES* REVIEW

I, Dr. Randall K. King, Ph.D. declare as follows:

I. BACKGROUND AND QUALIFICATIONS

1. I have bachelors, masters, and doctoral degrees in mechanical engineering from Oklahoma State University. I have been a registered professional engineer (PE) since 1987.

2. I have been associated with mechanical design as a designer and consultant for the past 44 years. While earning my PhD degree. I worked as a full time research engineer at the Fluid Power Research Center performing research and testing on hydraulic pumps, filtration, and fluid handling equipment, and writing technical papers documenting the research.

3. I served as an R&D and pump design engineer for Halliburton Energy Services for 10 years, designing, developing, and testing high-pressure positive displacement pumps and oilfield equipment for hydraulic fracturing (fracking) of oil and gas wells. I designed both fluid ends and power ends of large (1,500 horsepower) pumps for operating pressures up to 20,000 psi. Some of the highly stressed components were processed (autofrettaged) by subjecting them to hydraulic pressures of up to 60,000 psi, using ultra-high pressure pumps in high-pressure test cells.

4. I served as an R&D and mechanical design engineer for NTN (a large Japanese bearing and automotive components manufacturer) for 7 years designing, developing, and testing automotive components.

5. I have served as a forensic engineer, conducting forensic analyses for Bison Engineering and King Professional Engineering for the last 14 years. This work includes failure analyses, including various types of pumps accident investigations, patent evaluations, and product liability evaluations involving mechanical equipment of many varied types and uses

6. I have been awarded 15 U.S. Patents and a number of foreign patents for my contributions.

7. A copy of my curriculum vitae, which describes in further detail, qualifications, responsibilities, employment history, honors, awards, professional associations, and publications is attached to this declaration as Exhibit Waterblasting 2013.

8. I have reviewed United States Patent No. 7,255,116 (“the ’116 Patent”) to James P. Crocker with its file history. I have also reviewed the petition for *inter partes* review submitted herewith, with its supporting documents. For convenience, all of the information that I considered in arriving at my opinions is listed in Exhibit Waterblasting 2014.

For my efforts in connection with the preparation of this declaration I have been compensated at my hourly rate of \$330 per hour. I do not derive any compensation contingent on the outcome of these or any other proceedings relating to the above-captioned patent.

II. INFORMATION PROVIDED TO ME

9. In proceedings before the USPTO, I understand that the claims of an unexpired patent are to be given their broadest reasonable interpretation in view of the specification from the perspective of one skilled in the field. That is, the claims must be interpreted as broadly as their terms reasonably allow, consistent with the ordinary customary meaning of the terms (unless a term has been given a special definition in the specification) and the use of the claim term in the specification and drawings. I have been informed that the '116 Patent has not expired. In comparing the claims of the '116 Patent to the known prior art, I have carefully considered the '116 Patent, and the references forming the grounds for instituting inter partes review using my experience and knowledge in the relevant field.

10. I understand that in an inter partes review proceeding instituted by the United States Patent and Trademark Office, the petitioner has the burden of proving a challenged claim of unpatentability by a preponderance of the evidence.

11. I understand that a claim is invalid if its subject matter is anticipated or obvious. I further understand that anticipation of a claim requires that every element of a claim be disclosed expressly or inherently in a single prior art reference, in combination, as claimed.

12. I further understand that obviousness of a claim requires that the claim be obvious from the perspective of a person having ordinary skill in the relevant art at the time the alleged invention was made. I further understand that a patent claim can be found unpatentable as obvious where 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 relevant field. I understand that an obviousness analysis involves a consideration of (1) the scope and content of the prior art, (2) the differences between the claimed invention and the prior art, and (3) the level of ordinary skill in the pertinent field.

13. I further understand that certain factors may support or rebut the obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of those having ordinary skill in the art at the time of invention, unexpected results of the invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the

0alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a connection between any such secondary considerations and the alleged invention. I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

14. I further understand that when determining the differences between prior art and the claims at issue, the primary factual issues to be determined are: (1) whether the prior art references are in the same field of endeavor as the patented invention; (2) whether there was a sufficient motivation to combine the references; and (3) the existence and significance of pertinent secondary considerations. I understand that a claim is obvious if it unites old elements with no change to their respective functions, or alters prior art by mere substitution of one element for another known in the field and that combination yields predictable results. While it may be helpful to identify a reason for this combination, common sense should guide and no rigid requirement of finding a teaching, suggestion or motivation to combine is required. When a product is available, design incentives and other market forces can prompt variations of it, either in the same field or different one. If a person having ordinary skill in the relevant art can implement a predictable variation, obviousness likely bars its patentability. For the same reason, if a technique has been used to improve one device and a person having ordinary

skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious. I understand that a claim may be obvious if common sense directs one to combine multiple prior art references or add missing features to reproduce the alleged invention recited in the claims.

15. I have been asked to consider and to provide an opinion, as to whether the relevant claims of the '116 patent would be obvious from the perspective of a person of ordinary skill in the art in the field identified in the '116 patent, at the time of the invention disclosed in the '116 patent, by utilizing the standards set forth above.

III. THE '116 PATENT

16. The objective of the '116 Patent is to solve certain problems arising in prior art, for a cleaning system capable of removing roadway and runway markings from pavement surfaces by high pressure water blasting. These include: the ability to place an operator close to the point of material removal, by use of a self-propelled tractor (mobile frame), capable of sideways loading and docking on a truck or trailer. A hydraulically articulated blast head is mounted on the tractor, so as to permit a width less than 8'6" when so docked, thus, allowing for safe, fast, legal over-the-road travel to job sites.

17. A further objective is to allow the tractor to be quickly deployed by not having to connect or disconnect hoses to other equipment mounted on the support vehicle at the job site.

IV. THE LEVEL OF ORDINARY SKILL IN THE ART

18. The priority date for the '116 Patent is no earlier than July 2, 2004. A person of ordinary skill in the art with respect to the '116 Patent at the time of the invention is someone with at least a bachelor's degree in mechanical engineering and at least two years of experience designing and analyzing very high-pressure pumping and spray equipment. A mechanical engineering degree would normally be required to have the background necessary to successfully use high water pressure blasting to successfully remove very tenacious coatings from hard surfaces without abrading away the upper layers of the surface itself and also to insure that the system could be operated safely, given the inherent danger involved with operating at these high pressures/

19. Extensive experience and technical training might substitute for educational requirements, while advanced degrees might substitute for experience.

V. CLAIM CONSTRUCTION

a. Background of the Invention for Claim Construction.

20. To construe the identified claims, the context for the claims of the '116 patent is necessary to determine what the broadest reasonable interpretation is for each of the disputed claims. The '116 patent claims a “cleaning system for removing coatings from a hard surface by a high pressure liquid” ('116 Patent at 6:35-36). The “cleaning system” claimed in the '116 patent includes a “stripe removal system” ('116 Patent at 2:36), and a “paint removal system” ('116 Patent at 3:33). Its purpose is to remove materials such as “traffic paint, thermoplastic, epoxy paint, and preformed tapes” ('116 Patent at 1:14-15), which are designed to be “as durable and permanent as possible” ('116 Patent at 1:17). These paints “penetrate(s) into the pavement, perhaps $\frac{1}{8}$ - $\frac{3}{8}$ inch, so that mere surface removal of the paint is not sufficient to remove the marking.” ('116 Patent at 1:27) The cleaning system described in the patent is not meant to replace systems which remove dirt using low-pressure water, detergents, and brushes, but rather systems which remove strongly bonded coatings which would otherwise require removing the outer layer, or layers, of the hard surface that the coating is bonded to, by using techniques such as grinding and shot blasting ('116 Patent at 1:34-51).

21. The “cleaning system” removes these coatings by blasting them with high-velocity water jets, which impact the coating with a substantial mass of water

traveling at extremely high velocity. For example, a water blasting system described in the patent might pump water through a number of tiny (0.006” diameter) sapphire nozzles at a pressure of 40,000 pounds per square inch (psi) at a total flow rate of 6 gallons per minute (gpm). At this pressure, the water is violently forced out through the nozzles at a velocity of almost 1,200 miles per hour, which is about 1.5 times the speed of sound¹. This is equivalent to a velocity of around 1,700 feet per second, which is over 25% higher than the muzzle velocity of a 357 Magnum handgun bullet². The severe impact of the water in this process provides insight into why the industry uses the term “water blasting”, instead of “spraying” to describe the process³.

22. Therefore, one of ordinary skill in the art would understand that the “cleaning system” disclosed and claimed in the ’116 Patent is not the same as more commonly encountered cleaning systems, such as street cleaning vehicles or similar devices, which use low-pressure spray in combination with detergents and brushes to remove dirt and contaminants, while cleaning only the outer surface of the road.

23. One of ordinary skill in the art would therefore understand Claims 1, 2, 3, 4, 5, 6, and 10 of the ’116 Patent to be claiming a “cleaning system” which

¹ See calculation provided in Waterblasting 2014

² 357 Magnum handgun cartridge with 140 grain projectile, from Handgun Ballistics, gunndersden.com/index.htm.handgun-ballistics.html, attached as Waterblasting 2016.

³ As in the corporate names of both parties in the matter at hand

ideally removes coatings applied and bonded to a hard surface by blasting it with sufficiently high pressure liquid so as to erode away the coating, penetrating below the outer layer to remove parts of the coating embedded underneath the outer layer of the surface without removing the outer layer of the surface.

b. “Coating”

24. The petitioner has proposed that the term “coatings” should be construed as “a layer of *any* substance spread over a surface.” (Petition for IPR, p. 16) This is an extremely broad definition, which introduces almost no limitations on materials to be removed by a cleaning system, and is not “reasonable” from the perspective of one skilled in the field in view of the specification and claim language. According to this definition, wiping dust off of a countertop would constitute removing a coating according to the ’116 Patent, if so construed. This overly broad proposed construction of “coating” fails to account for the “coatings” being understood by a person of ordinary skill in the art as a layer of a substance that is *applied to and bonded to* a surface. The Petitioner’s proposed construction is so broad as to encompass a substance spilled onto a surface, such as spilling water from a cup. As such, the Petitioner’s proposed construction is not the commonly understood meaning of a “coating” to a person of ordinary skill in the art. Further, given the claim terms requiring “high pressure” to remove the

“coating,” in light of the specification, the Petitioner’s proposed construction would not be a *reasonable* interpretation to a person of ordinary skill in the art.

25. The specification of the ’116 Patent describes the coatings to be removed by the invention much more specifically as: “*traffic paint, thermoplastic, epoxy paint, and preformed tapes*” (’116 Patent at 1:14-15), substances which are designed to be “*as durable and permanent as possible*”. (’116 Patent at 1:17-18) If properly applied, these coatings are extremely adherent and resistant to wear and removal. For example, one government specification for highway marking paint requires the degree of wear of the coating to be evaluated in a field trial after withstanding 3,000,000 vehicle passes on a public highway⁴.

26. One of ordinary skill in the art would understand “coating(s)” in Claim 1 of the ’116 Patent to mean “a layer of durable material applied and strongly adhered to a hard surface”.

c. “Hard surface”

27. The petitioner has proposed that the term “hard surface” should be construed as “any surface having rigidity sufficient to support the weight of a vehicle carrying the blast head.” The petitioner quotes the ’116 Patent specification, which names “highways runways, parking decks, and other hard surfaces,” (’116 Patent at 1:6-7), and for some unknown reason focuses on

⁴ TNZ M20: 2003. Specification for Long-Life Roadmarking Materials, NZ Transport Agency, Section 3.4, attached as Exhibit Waterblasting 2017.

“surfaces, on which the vehicle may be driven.” The ’116 Patent is not concerned with evaluating which surfaces are capable of supporting the blast vehicle, indeed the entire milieu is spelled out in the very first sentence of the body of the patent – *“This invention relates to the field of high pressure water cleaning devices for highways, runways, parking decks, and other hard surfaces.”* (’116 Patent at 1:5-7)

28. The ’116 Patent is concerned with hard surfaces because hard surfaces provide the only substrates from which a durable coating which is tightly bonded to the surface can be efficiently removed by high impact water blasting while minimizing the amount of erosion to the surface itself. As is discussed in the prior art disclosed in the patent, the alternative methods in the prior art for removing “coatings” include mechanically grinding or cutting away a layer of the surface itself to remove the coating embedded within that upper layer. (’116 Patent at 1:34-51).

29. Using the construction proposed by the petitioners, a dry hard-packed dirt road would be a “hard surface,” yet it could not withstand high pressure water blasting. Any coating on this surface could be readily removed by a garden hose with a normal household nozzle, and there would be no need or motivation to employ the complicated and expensive technology discussed in the ’116 Patent. Moreover, attempting to remove any coating from the dry hard-packed dirt with a

high pressure water nozzle would remove the dirt along with whatever coating the user attempts to remove. The definition proposed by the petitioners would clearly not be of any use or interest to one of ordinary skill in the art, in striving to understand the technology and claims disclosed in the '116 Patent.

30. One of ordinary skill in the art would understand that “hard surface” in Claim 1 of the '116 Patent means the surface of a material that is hard enough to withstand high-pressure water blasting without disintegrating, for instance paving material in common use for road, parking lot, and airport runway surfaces, such as “asphalt or concrete.” ('116 Patent at 1:16). The entire purpose of this technology is to remove these tenaciously bonded coatings from the hard surface, to improve the surface for its intended use, say, as a runway or highway. It would make no sense to one of ordinary skill in the art to use this powerful blasting equipment on a softer surface which would be destroyed by the process.

d. “High pressure”

31. The petitioner has proposed that the term “high pressure” should be construed as “of or relating to pressures higher than normal, especially higher than atmospheric pressure.” This is an extremely broad definition, which seems to include almost any pressure even slightly above atmospheric pressure. One might argue, using this definition, that blowing up a balloon for child’s birthday party would require “high pressure.”

32. One of ordinary skill in the art would understand that the term “high pressure” can mean very different things in different circumstances. For instance, a racing road bicycle tire with a normal inflation pressure of 120 psi could be considered a high-pressure tire, compared to a mountain bike tire at 65 psi. For years, a 3,000 psi hydraulic system was considered high-pressure, whereas now a high-pressure hydraulic system is more likely to refer to a 5,000 psi system. Specific information is needed to understand what “high pressure” means for the system and circumstances under consideration.

33. For the ’116 Patent, the detailed description of the invention in the specification describes pressures used in the invention as “greater than 25,000-40,000 psi.” These pressures, described alternately as “high pressure” (’116 Patent at 2:24-25) and “ultra high pressure” (’116 Patent at 2:26) in the specification are much, much higher than most things that are considered “high pressure”, and they require a specialized pump, hoses, and fittings, specifically designed for this pressure range. Further, during the prosecution of the ’116 Patent the inventor and Patent Office agreed that systems less than 5,000 psi were not “high pressure” in the context of the ’116 Patent⁵.

⁵ The inventor responded on 8/17/06 to an 8/17/06 final rejection of Claims 1, 3, and 5 by referring to water from a 5,000 psi pump for cleaning concrete as “low-pressure water.” The examiner responded on 12/20/06, stating that “Applicant’s arguments . . . are persuasive (and) . . . the rejection of claims 1-3 and 5 has been withdrawn. Reprinted in Waterblasting Exhibit 2018.

34. A person of ordinary skill in the art reviewing the '116 Patent would consider the broadest reasonable interpretation of the term “high pressure” to be a pressure sufficiently high to be able to blast a coating off of a hard surface, by severing the bonding between the coating and the hard surface. Further, the “high pressure” must be sufficient to penetrate the pores and imperfections of the hard surface to remove the coating bonded and embedded within the outer layers of the hard surface. Accordingly, one of ordinary skill in the art would understand from this specific information from people actually developing, producing, and using the technology provided in the specification that “high pressure” in Claim 1 of the '116 Patent refers to pressure greater than 25,000 psi.

e. “Connected to”

35. The petitioner has proposed that the term “connected to” should be construed as “directly *or indirectly* joined or linked together.” The petitioner argues that this construction is “in accordance with its plain and ordinary meaning, quoting its own expert report (Blasters Exhibit 1009).

36. The term “connected to” in Claims 1, 2, 3, and 6 of the '116 Patent is readily understandable to one of ordinary skill in the art to mean “directly joined or linked together,” in accordance with the plain meaning of “joined or linked together” given the Merriam Webster Unabridged Dictionary (Blasters Exhibit 1012).

f. “Blast Head”

37. The petitioner has proposed that the term “blast head” should be construed as “a mechanical component having one or more nozzles for ejecting a substance onto a surface.” (Petition p. 14). He notes that ““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.”” (‘Blasters-1001 at 3:65-67). But the Petitioner’s proposed construction would include water spray heads as commonplace as a showerhead or a lawn sprinkler, and his proposed construction is therefore unreasonably overbroad.

38. I do agree with the Petitioner’s statement that this is a very informative sentence. However, the Petitioner avoids the most informative words in the sentence – “high pressure nozzles delivering high pressure fluid to the surface.” As addressed above, the pressure must be greater than 25,000 psi to be reasonably considered high pressure in the context of the ’116 Patent. With such a pressure, the “blast head” is doing more than simply “ejecting a substance onto a surface,” it is forcefully blasting the fluid at the surface to break the bonding of the coating and penetrate within the pores of the hard surface to remove the portions of the coating that are embedded within the porous surface.

39. One of ordinary skill in the art would therefore understand the broadest reasonable interpretation of “blast head”, in accordance with the ’116 Patent specification as: “a mechanical component having one or more high pressure nozzles for delivering high pressure fluid onto a surface.”

g. “Articulating link”

40. The ’116 Patent describes the blast head as being mounted to the tractor on an articulated link. The specification describes the articulated link as being able to allow horizontal movement of the blast head, left and right, as seen below in photos from a brochure produced by Waterblasting, LLC in January, 2004, showing an articulated link which practices the ’116 Patent. (’116 Patent at 4: 11-14). This allows the operator to accommodate different striping patterns on the roadway and also aids the operator’s visibility during operation.



41. The specification also describes the articulated link as being able to allow vertical movement of the blast head, up and down, ('116 Patent at 4:35-38). This allows the blast head to change elevation to follow the contours of the road, as shown below.



42. The articulating link also allows the blast head to be “raised to the vertical position and then manually flipped up and back reducing the overall length to permit the tractor to be stowed on a truck bed sideways consuming a space less than 8’6” for highway travel. As shown below.” ('116 Patent at 4:38-42).



43. The articulating link as described in the '116 Patent thus allows the blast head to move in three degrees of freedom: horizontal translation (left and right), vertical translation (up and down), and vertical rotation (flipped up and back),

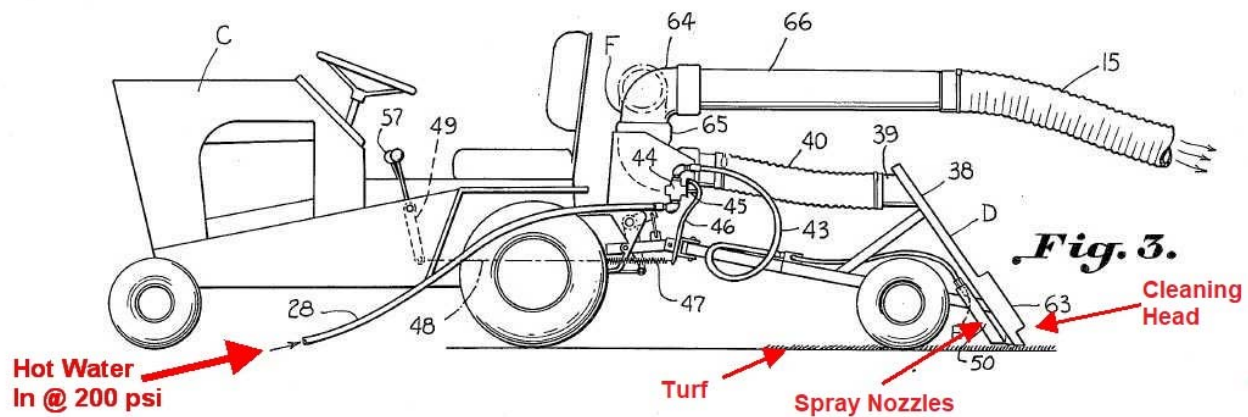
44. One of ordinary skill in the art would understand an “articulating link” to be a structure that mounts the blast head to the tractor which allows the blast head to have least two translational degrees of freedom and at least one rotational degree of freedom.

VI. THE PRIOR ART

Jones

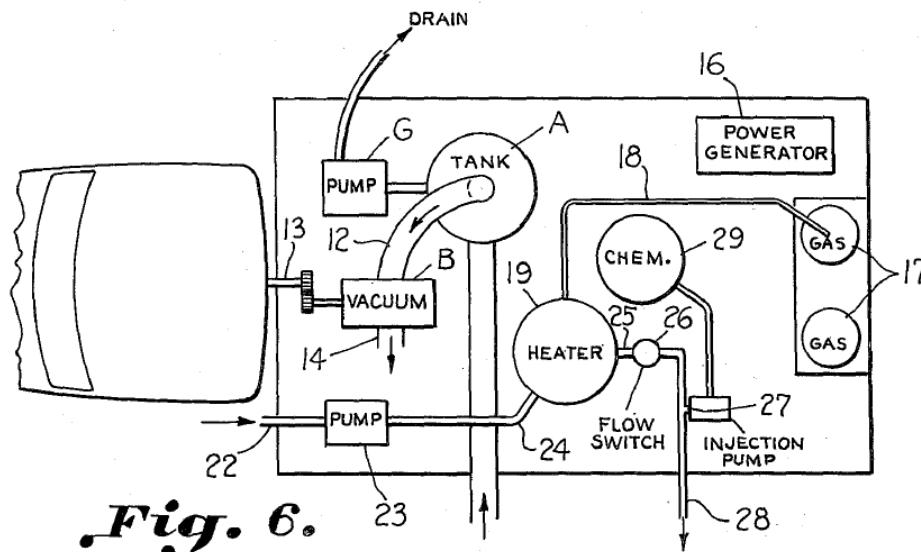
45. The petitioner has cited US Patent 3,902,219 (Jones) as prior art against the '116 Patent. Jones discloses an “apparatus designed for cleaning large fields having artificial turf thereon.” (Jones 1:3-4). An objective of this invention is to provide a “provide a portable device for cleaning large areas having artificial turf and the like.” (Jones 1:24-25). The device is targeted toward “problems encountered with such field(s) . . . oily fallout, soot, broken glass, and other materials (which) collect on the artificial turf.” (Jones 1:4-11).

46. Cleaning is performed by a “motorized utility cleaning vehicle” (Jones 1:46), as seen below in Figure 3 from Jones.



The motorized utility cleaning vehicle can be a “vehicle . . . for mowing large areas” or “a tractor.” (Jones 3:11-13).

47. The cleaning vehicle is connected by two hoses to a separate support vehicle, has seen below, in Figure 6 from Jones.

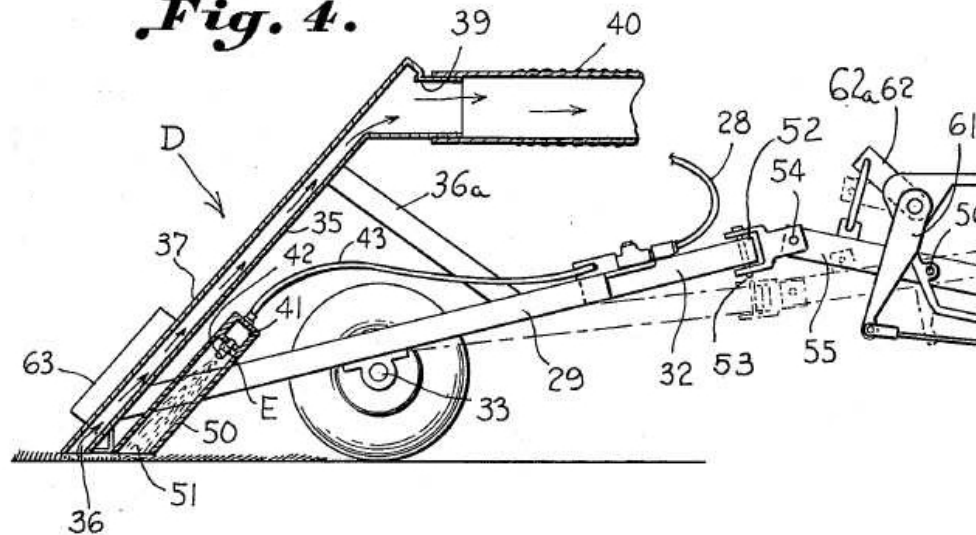


The support vehicle (the truck) is a truck mounted with a vacuum tank, A, a vacuum pump, B, a cold water inlet, 22, a pressure booster pump, 23, a hot water heater, 19, and a hot water outlet, 28.

48. The water for cleaning the turf is supplied from “any suitable source” (Jones 2: 56-57) to the cold water inlet, 22, on the truck, most likely from a faucet at normal city water pressure, say 50-100 psi. The water then passes through the pressure booster pump, 23, “which builds the pressure of the water to approximately 200 pounds per square inch.” (Jones 2:58-60), and then through the water heater, 19, “where it is heated to approximately 180° Fahrenheit.” (Jones 2: 62). The chemical injection pump, 27, then injects “any suitable conventional chemical” from the chemical tank, 29, into the stream of water. (Jones 3: 1-3) before the water/chemical solution passes out into the hot water outlet hose, 28.

49. The turf is cleaned by the hot water/chemical solution (cleaning medium), which comes in through the hose, 28, at 200 psi. The cleaning medium goes to spray nozzles, 42, where it is sprayed onto the turf to be cleaned, has seen below in the excerpt from Figure 4 of Jones. The cleaning medium is then sucked up off of the turf into the suction nozzle, 36, and is carried by the vacuum hoses, 40 and 15, to the vacuum tank, A, on the truck.

Fig. 4.



50. Based on the claim construction analysis discussed above in Section V, it is apparent that Jones does not disclose the following elements of the '116 Patent:

- A “cleaning system” that removes durable coatings which are applied and bonded to a hard surface by eroding away the coating by impacting it with high velocity water – But rather, a “portable device for cleaning artificial turf . . . utilizing a cleaning medium.” (Jones 1:57-58).
- Durable “coatings” strongly adhered to a hard surface – But rather, “oily fallout, soot, and broken glass.” (Jones 1:4-11)
- “Hard surfaces”, such as highways runways, and parking decks – But rather, artificial turf on a football field. (Jones 1:3-5)

- “High pressure”, that is, pressure of at least 25,000 psi , provided by a very specialized positive displacement pump– But rather, 200 psi, provided by a small “booster pump.”
- a “pump connected to a mobile blast head.” – But rather, a small “booster pump” connected to a low-pressure “cleaning head.:
- an “articulating link” providing at least two translational degrees of freedom and at least one rotational degree of freedom relative to the portable cleaning device.

51. Indeed, the entire cleaning method described in Jones is fundamentally different from the technology claimed in the ’116 Patent, as discussed above. Jones is not concerned with removing durable coatings which are tightly bonded to a hard surface by eroding away the coating by impacting it with high velocity water, it merely discloses a system for spraying hot water on artificial turf and vacuuming it off to remove dirt & contaminants. It is much more akin to a regular household rug cleaner, such as those marketed under the name “Rug Doctor,” than it is to the technology disclosed in the ’116 Patent.

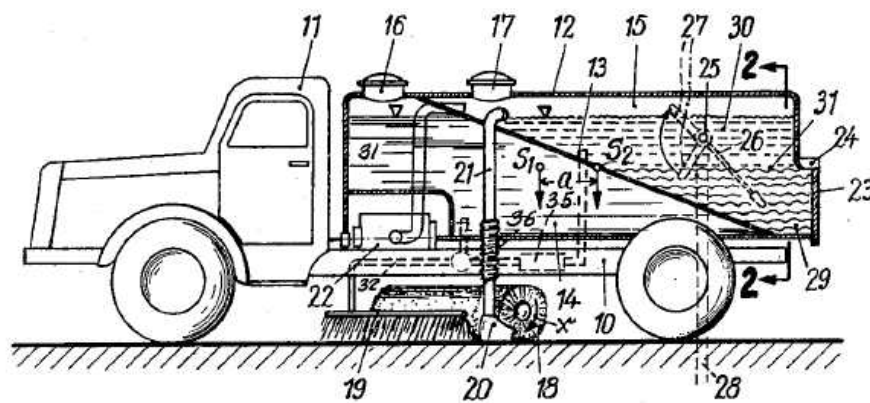
52. One of ordinary skill in the art would not look to Jones for teaching on how to improve a system for removing tightly bonded coatings from hard surfaces. Rather, because of Jones’ application to turf fields, a person of ordinary skill in the

art would find that Jones teaches away from the present invention because using high pressure would tend to shred the turf rather than clean it.

Breither

53. The petitioner has cited US Patent 3,011,206 (Breither) as prior art against the '116 Patent. Breither discloses a truck-mounted street sweeper, as seen below in Figure 1 from Breither.

Fig. 1



54. This system discloses a method to clean streets, which “wets the dirt or rubbish on the road, which sweeps the dirt substantially to one point, and which then sucks up the dirt in its wet condition”. (Breither 1: 20). The cleaning method described in Breither is fundamentally very different from the technology claimed in the '116 Patent.

55. Based on the claim construction analysis discussed above in Section V, it is apparent that Breither does not disclose the following elements of the ‘116 Patent:

- A “cleaning system” that removes durable coatings which are tightly bonded to a hard surface by blasting away the coating by impacting it with high velocity water – But rather, a system which wets the dirt on the road, sweeps it together, and then sucks it up.
- Durable “coatings” strongly adhered to a hard surface – But rather, dirt and rubbish
- “High pressure”, that is, greater than 25,000-40,000 psi, provided by a very specialized positive displacement pump– But rather, Breither states that the cleaning water is “sprayed on the road” (Breither 3: 8-9), but nowhere asserts that the cleaning process is assisted by high-pressure or high-velocity water impact and has no discussion of water pressure, quantitative or otherwise, connected with the road cleaning process.
- a “pump connected to a mobile blast head.”
- an “articulating link.”

56. Indeed, the entire cleaning method described in Breither is fundamentally different from the technology claimed in the ‘116 Patent, as discussed above. Breither is not concerned with removing durable coatings which

are tightly bonded to a hard surface by blasting away the coating by impacting it with high velocity water, it merely discloses a system for wetting and sucking up dirt from a street.

57. One of ordinary skill in the art would not look to Breither for teaching on how to improve a system for removing tightly bonded coatings from hard surfaces. As with Jones, a person of ordinary skill in the art would find that Breither teaches away from using high pressure to clean the street, because a “high pressure” pump combined with Breither would result in the street cleaner removing all bike lane and parking markings that are on the street as it cleans—a dangerous result that would be undesirable.

NLB

58. The petitioner has cited brochure OP-7M-9/02 from NLB Corp. entitled “Water Jet Solutions for Removing Pavement Markings and Runway Rubber” (NLB) as prior art against the ‘116 Patent. (Blasters Exhibit 1006). The brochure discloses that “NLB delivers the power of ultra-high pressure water (up to 40,000 psi, or 2,800 bar) in automated and semi- automated systems. . . . our compact Stripejet™ is specially designed for short-line jobs, like parking decks and intersections.” (NLB, p. 1). The Stripejet™ is presented as a tractor-mounted system, analogous to the mobile tractor with blast head of the ‘116 patent, as shown below in a figure from page 4 of NLB.



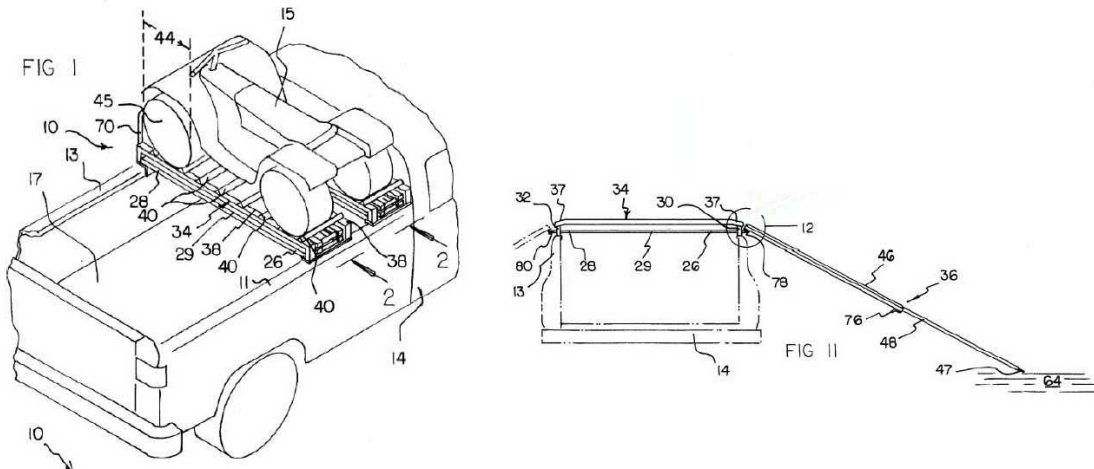
59. In the figure, hoses appear to be attached to a blast head, and they appear to be a high-pressure water hose and a larger vacuum hose. However, the brochure gives no additional information about whether these hoses are connected to additional equipment not mounted on the tractor, and if so, any description or details concerning such additional equipment. For instance, the brochure does not state that the tractor must be tethered to a support truck. While this might seem apparent from comparison with other systems, a photo from page 6 of NLB, shown below, discloses a system with a manually operated blast head, the Vortex™, which appears to be tethered to a pump mounted on a trailer.



60. However, the figures and description of the NLB reference does not disclose a device having an “articulating link” as claimed in the ’116 Patent. As shown in the above figure of the StripeJet, the blast head is shown attached to a fixed support that can move left or right by the support sliding along the plate track on the front of the device. No pivotable movement is possible based on the figure, and the blast head does not have at least two degrees of relative translational movement to the vehicle. As such, it does not disclose the “articulating link” that is claimed in Claim 1 of the ’116 Patent.

Schrunk

61. The petitioner has cited US Patent 5,494,393 (Schrunk) as prior art against the ’116 Patent, as seen below in Figures 1 and 11 from Schrunk.



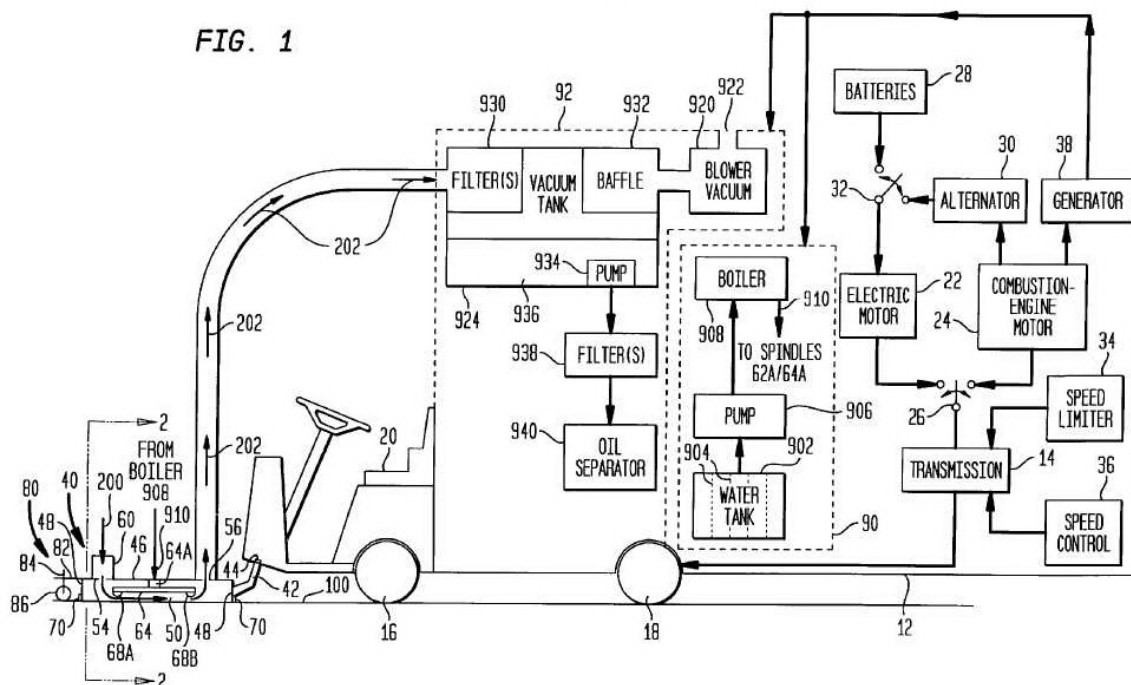
Schrunk discloses a truck mounted vehicle-carrying apparatus, which uses a retractable ramp assembly to carry a “small vehicle” such as an ATV, transversely atop the side walls of a truck bed. However, the “small vehicle” which Schrunk’s system is meant to carry does not include a mobile blast head, as disclosed in the ’116 Patent

Clemons

62. The petitioner has cited US Patent 6,381,801 (Clemons) as prior art against the ’116 Patent, as seen below in Figure 1 from Clemons. Whereas the petitioner bases his Grounds 1-3 on Jones, he bases his Grounds 4-5 on Clemons because Clemons discloses a reservoir (water tank 902), which Jones lacks. Clemons discloses a self-propelled brushless surface cleaner which is a self-contained unit that sprays hot pressurized water onto a surface to loosen dirt, rubber, oil, grease, etc.” (Clemons 1: 12-15). Clemons does not have the system separated into a motorized utility cleaning vehicle and a support vehicle, as does

Jones, but the technology of the two systems is similar in many respects.

Importantly, neither system constitutes a “cleaning system,” that is, “a system for removing durable coatings which are tightly bonded to a hard surface by blasting away the coating by impacting it with high velocity water,” for reasons similar to those discussed above for Jones.



63. Clemons uses a relatively low-pressure (4,000 psi)⁶ spray of heated (150° F) water with to “loosen dirt, rubber, oil, grease, etc.” from “hard flat industrial surfaces. (Clemons at 6:16, 1:14-15 and 1:57). A person of ordinary skill in the art would understand that Clemons does not remove coatings from a surface, it removes dirt and debris from the outer layer of a surface, similar to the

⁶ The Patent Office agreed with the inventor during prosecution of the '116 Patent that systems less than 5,000 psi are not “high pressure” in the context of the '116 Patent. (Waterblasters Exhibit 2018).

way that a car wash sprays heated pressurized water to remove surface dirt but does not strip the paint off of your car in the process.

64. Clemons does not disclose the following elements of the '116 Patent:

- A “cleaning system” that removes durable coatings which are applied and bonded to a hard surface by eroding away the coating by impacting it with high velocity water – But rather, a low-pressure (4,000 psi)⁷ spray of heated water “loosens solid debris and other contaminants” from the outer layer of a surface. (Clemons at 6:16, 5:58).
- Durable “coatings” strongly adhered to a hard surface – But rather, dirt, rubber, oil, grease, etc “. (Clemons at 1:14-15).
- “High pressure”, that is, pressure of at least 25,000 psi , provided by a very specialized positive displacement pump – But rather, 4,000 psi, which is considered low pressure in the context of the '116 Patent, as agreed by the examiner. (Waterblasters Exhibit 2018).
- a “pump connected to a mobile blast head.” – But rather, a pump “connected to a low-pressure “cleaning head. (Clemons at 3:36),
- an “articulating link” providing at least two translational degrees of freedom and at least one rotational degree of freedom relative to the portable cleaning device. Clemons’ “cleaning head 40 is mounted . . . (by) an arm 42 pivotally

⁷ The Patent Office agreed with the inventor during prosecution of the '116 Patent that systems less than 5,000 psi are not “high pressure” in the context of the '116 Patent. (Waterblasters Exhibit 2018).

attached to frame 12.” (Clemons at 3:36-38). Clemons discloses that that the arm can “raise/lower cleaning head 40 and set a forward-to-rear pitch angle of cleaning head 40,” but the arm 42 has no means of moving the cleaning head from side to side. Thus, Clemons’ “arm 42” can move the cleaning head in one rotational degree of freedom (changing its forward-to-rear pitch angle) and one translational degree of freedom (raise/lower), but lacks the required second translational degree of freedom required by the correct construction of “articulating link.”

65. The invention disclosed by Clemons uses an entirely different cleaning method than the method disclosed in the “cleaning system” of the ‘116 Patent – “a system for removing durable coatings which are tightly bonded to a hard surface by eroding away the hard surface by impacting it with high velocity water.”

VII. PATENTABILITY CONTENTIONS

66. The ‘116 patent admits Stripejet™ from NLB as prior art, including its use of a high-pressure pump and a blast head. However, the disclosure of the Stripejet™ in the petition is based on only two photographs and a few details from a sales brochure. Few details are given which relate to the claim elements of the

'116 patent. (Blasters Exhibit- 1001). Thus, the petitioner has brought in additional prior art to combine with NLB to attack the validity of the '116 patent. The major issue with most of this prior art is that it deals with technology that is totally different from the '116 patent, and it is not material that one of ordinary skill in the art would look to as relevant to a “system for removing durable coatings which are tightly bonded to a hard surface by blasting away the coating by impacting it with high velocity water,” in accordance with the construction of “cleaning system” discussed above.

67. The petitioner has advanced five grounds attacking the validity of various claims of the '116 patent.

Ground	Claims	Prior Art
1	1, 2, 10	Jones, Breither, NLB
2	3, 4	Jones, Breither, NLB, Herhold
3	5, 6	Jones, Breither, NLB, Herhold, Schrunk
4	1 – 4, 10	Clemons, NLB
5	5, 6	Clemons, NLB, Schrunk

Ground 1: Claims 1, 2, 10 – *obvious over Jones in view of Breither and NLB*

68. The petitioner asserts that Claims 1, 2, and 10 are obvious over Jones in view of Breither and NLB. He claims that there is “significant overlap between

the cleaning systems disclosed in Jones, Breither, and NLB (Petition, p. 23). He argues that, after all, each of these “cleaning systems” (a.) is self-propelled, (b.) removes foreign substances from a “surface” (c.) by spraying a liquid thereon, and (d.) uses a vacuum to send the liquid and foreign matter to a vacuum tank. Thus, he considers these three systems (and, by implication, the system of the ’116 patent) to be “analogous.” From this starting point, he goes on to begin building combinations of – Jones plus a reservoir from Breither, Jones plus the ultra high-pressure system from NLB, etc., to create arrangements which he uses to allege invalidity of the ’116 patent.

69. However, these arrangements which he constructs are dependent on his unreasonable claim constructions, as discussed above in Section V.

70. For example, he argues that there is significant overlap between the “cleaning systems” disclosed in Jones, Breither, and NLB. However, Jones and Breither are not “cleaning systems” – construed as “a system for removing durable coatings which are tightly bonded to a hard surface by blasting away the coating by impacting it with high velocity water,” as discussed above: They can’t remove durable coatings tightly bonded to a hard surface, they don’t penetrate below the outer layer to remove parts of the coating, and they don’t impact a surface with high-velocity water. It is true that all of these systems are self-propelled, but the “substances” that are removed by the processes are very different from those

named in the '116 Patent – “oily fallout, soot, and broken glass” for Jones (Jones at 1: 39-40), and “dirt or rubbish” for Breither (Breither at 1:20), as opposed to “traffic paint, thermoplastic, epoxy paint, and preformed tapes. (’116 at Patent 11:14). The cleaning methods are also very different – For example, Jones sprays “hot cleaning medium on the turf,” (Jones 2:4). These different methods are not analogous, as the Jones method is very different from the high-velocity water impact of the ‘116 patent, and not even the same as Breither’s cleaning method, which uses “a scrubbing or sweeping brush,” a “rotary brush” (Breither at 2:36-41).

71. These very different technologies are not “analogous,” and one of ordinary skill in the art would not have looked to these systems for suggestions on how to improve a system for removing tightly bonded coatings from hard surfaces. Further, Jones and Breither teach away from using “high pressure” because it would defeat each of their respective purposes by destroying/removing the turf in the case of Jones and by removing the markings that Breither is intended to clean leading to a dangerous situation. Therefore, one of ordinary skill in the art would not be motivated to combine the references Jones and Breither with NLB.

Claim 1.

72. The petitioner asserts that Jones discloses “A cleaning system for removing coatings from a hard surface by high pressure liquid” This

assertion is based on his broad view of what a cleaning system is, relative to the '116 patent is, as discussed above, and his definitions of:

“coatings” as “a layer of any substance spread over a surface,” including “oily fallout, soot, and broken glass,”

“hard surface” as “any surface having rigidity sufficient to support the weight of a vehicle carrying the blast head,” including artificial turf, and

“high pressure” as ‘of or relating to pressures higher than normal, especially higher than atmospheric pressure’ including the 200 psi supplied by the booster pump in Jones. (Petition, pp. 13-15).

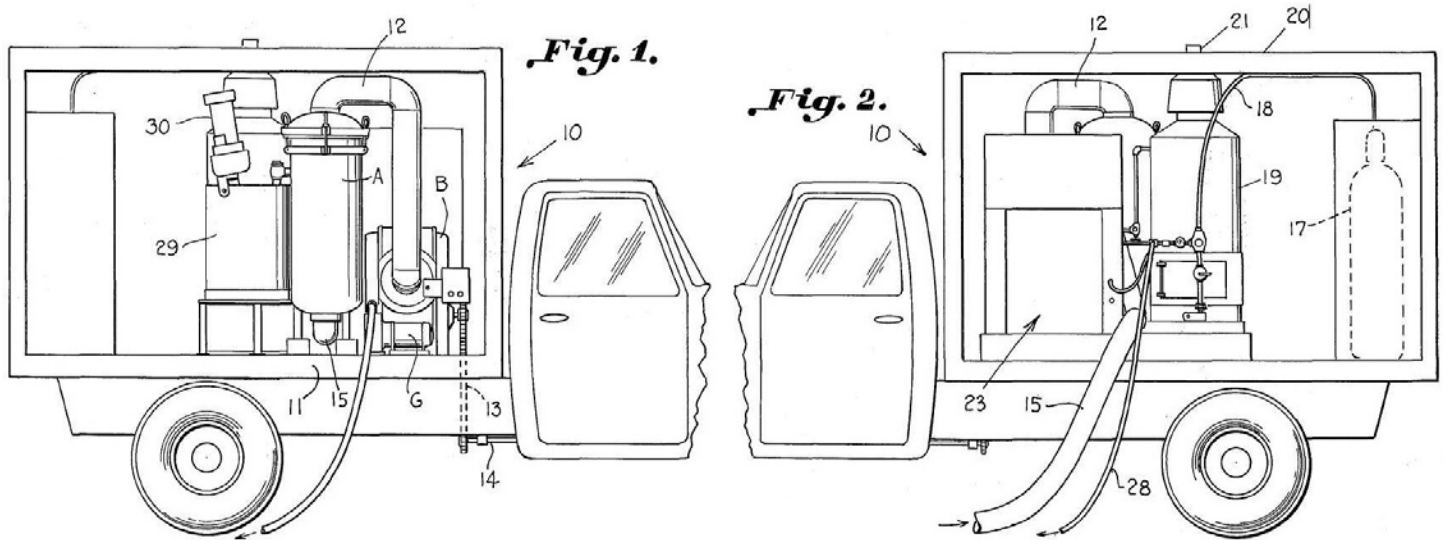
73. As discussed above in Section V, these constructions are not correct, and Jones does not disclose these claim elements, nor does he disclose an articulating link which allows the blast head to be moved in at least two translational degrees of freedom and at least one rotational degree of freedom.

74. The petitioner goes on to claim that “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 coatings from a concrete floor.” (Petition, p. 27). However, what the petitioner does not point out is the extreme difference between the 200 psi booster pump of Jones and the 40.000 psi ultra-high pressure pump of the '116 patent. The photo below, from a brochure produced by Waterblasting, LLC in January, 2004, shows an ultra-high pressure pump on a

water blasting system. The pump is a positive-displacement triplex pump which can produce 40,000 psi at 6 gallons per minute. The photo also shows the large 150 horsepower diesel engine that is required to drive the pump at these conditions.



75. This is in stark contrast to Jones’ “booster pump” which merely boosts the pressure of the incoming water supply up to 200 psi to spray it onto the artificial turf. Figures 1 and 2 of Jones, shown below, show side views of the supporting vehicle for the Jones cleaning apparatus, which contains all of the pumping and vacuum equipment.



76. Recall from Figure 6 of Jones, reproduced above in Section VI, that Jones' apparatus includes two water pumps, the "booster pump," 23, for boosting the pressure of the water flowing through the heater to the spray nozzles, and "a pump, G . . . for removing the collected fluid" from the vacuum tank. (Jones at 2: 38-40), Note that Figure 1 of Jones shows pump G, for removing collected fluid from the vacuum tank. Pump G appears to be a centrifugal pump driven by an electric motor. A similar small centrifugal pump would be an obvious design choice for the "electrically operated pressure booster pump, 23." (Jones at 2: 58) However, note that the "booster pump," 23, is not seen in either Figure 1 or Figure 2.

77. In contrast to the large ultra-high pressure positive displacement pump that would be required based on the disclosure in the '116 Patent, as seen above powered by the large diesel engine, the "booster pump" of Jones and its power

source are not even large enough to show up in Jones' side elevation drawings of Figure 1 and Figure 2.

78. In fact, Jones and Breither teach away from the extreme pressure used by NLB and the "high pressure" claimed in the '116 Patent – and thus there would be no motivation for one to combine the references as he suggests.

79. One of ordinary skill in the art would not be motivated to swap Jones' small 200 psi "booster pump" and small electric motor for the massive ultra high pressure pump and power source of the '116 Patent, while adding the reservoir from Breither, to turn the turf cleaning apparatus of Jones into "a system for removing durable coatings which are tightly bonded to a hard surface by blasting away the hard surface by impacting it with high velocity water," any more than one would be motivated to trade the motor from an electric golf cart for a large 150 horsepower diesel engine. That kind of power and pressure would entirely remove or shred the turf that Jones is designed to clean—a counterproductive result at least.

80. The difference between the two technologies is much more than the difference in the size of the pump and power source alone. Equipment for producing and containing this high amount of pressure – pumps, seals, hoses, tubing, nozzles, etc. is very specialized and extremely expensive. It requires a very high level of design, manufacturing, and quality control expertise. Ultra high

pressures also pose significant safety hazards. Any small leak at these pressures creates a high-velocity jet of water that can immediately create a hazard that would cut through a person's body with ease . This is true even for a very small leak, which can be very hard to see. For these reasons, it would not have been “obvious for a POSA to replace Jones’ pump with NLB’s “ultra-high pressure,” 40,000 psi pump” (Petition, p. 29), nor would one of ordinary skill in the art have been motivated to do so.

81. Similarly, one of ordinary skill in the art would not have been motivated to replace the equipment in Jones for a “hose designed for “ultra-high pressure” as disclosed in NLB” (Petition, p. 36), to supply water to Jones’ cleaning head, which he equates with a “mobile blast head,” (Petition, p. 36), and a nozzle “designed for ultra- high-pressure disclosed in NLB,” for the same reasons discussed above.

82. One who attempted to replace the pump, hoses, blast head, and other equipment on Jones with the high-pressure equipment from NLB would be met with significant design challenges. The ultra-high pressure pump would be much, much larger and heavier than the small booster pump on Jones. Since the pressure on the NLB pump is 200 times higher than the Jones pressure, this means that it would take 200 times more horsepower to drive the pump (assuming the same flow rate). This means that the small electric motor driving the Jones pump would need

to be replaced by a large power source, such as a large diesel engine. The larger power source would require a larger fuel tank, radiator, cooling fans, etc. As the components become larger, weight distribution on the truck becomes an issue which impacts where the components can be located. These changes to the design occur while the designer is trying to find a spot to carry the tractor on the truck. It soon becomes apparent that the most attractive way to meet this objective is to use the truck's road engine to drive the pump and possibly other accessories. Since the pump requires significant power, this requires large, expensive gearboxes to split the power between the pump and the drive train. Since the cooling fans are now larger, the logical way to drive them is with hydraulic motors, requiring their own pump and reservoir. The point of this discussion is that it is not a simple matter to simply replace Jones' low pressure pump and cleaning head with ultra-high pressure equipment. It would require a large engineering design and development effort, involving a great deal of engineering expertise, man hours, and cost. One of ordinary skill in the art would not have been motivated to combine Jones and Breither with NLB to achieve "ultra-high pressure water," as suggested by the petitioner.

83. Further, neither Jones, Breither, nor NLB disclose the "articulating link" required by Claim 1 of the '116 Patent. In addition to Jones, Breither and NLB teaching away from each other, a person of ordinary skill in the art with those

references would still not have a reference to teach all of the required elements of Claim 1 of the '116 Patent.

Ground 2: Claims 3, 4 – *obvious over Jones, Breither, NLB, and Herhold,*

84. Claims 3 and 4 are both dependent on Claim 1 and they relate to the “mobile blast head” of Claim 1. Claim 3 adds a “shroud connected to said blast head” and Claim 4 attaches the blast head to a “wheeled chassis for maneuvering over the hard surface.” Herhold discloses a shroud assembly made up of a “tubular sleeve 20 and pivotable end cuff 30.” (Herhold at 2:32-24). However, as addressed above, there is no motivation to combine Jones, Breither and NLB, and in fact the references teach away from such a combination. The addition of Herhold’s sleeve does not cure the deficiency of combining these references nor does it supply the missing articulating link that is not disclosed by Jones, Breither or NLB.

85. As noted above, one of ordinary skill in the art would not have been motivated to replace the pump, hoses, spray nozzles, and cleaning head of Jones with equipment “designed for ultra-high pressure” (Petition, pp. 29n 36) for the reasons discussed. Without this ultra-high pressure equipment, a “mobile blast head” would not function as a key part of the “cleaning system” in the manner described in the '116 Patent as a key component of the “cleaning system.”

86. Therefore, one of ordinary skill in the art would not be motivated to attach a shroud or wheeled chassis to “said blast head.”

Ground 3: Claims 5, 6 - *obvious over Jones, Breither, NLB, Herhold, and Schrunk*

87. Claim 5, which is dependent on Claim ,1 is for “A cleaning system of claim 4 (*with said mobile blast head attached to wheeled chassis*) wherein 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.”

88. Claim 5 arises from a significant motivation to produce a cleaning system in which the entire system can be taken out to a jobsite by one operator in a single vehicle, and then operated at the site by the operator, with no need for additional people or vehicles to transport the equipment. Having the separate self-propelled tractor for operating in confined spaces is an important innovation, but it would normally require a separate vehicle to bring the tractor to the jobsite, requiring an additional truck and operator which greatly increases the cost of the operation and adds to congestion at the jobsite. Since the jobsites are often on public roadways, space is normally at a premium, and additional congestion can reduce efficiency of the work and negatively impact worksite safety.

Alternatively, the tractor could also be brought to the site on a trailer pulled by the support vehicle. However, having a trailer attached to the support vehicle while the blasting is in progress makes maneuvering and placing the trailer/trailer

combination much more difficult at a congested job site, as seen below and it can create unsafe working conditions. (Waterblasting LLC Brochure, January, 2004).



89. If the operator decides to just remove the trailer from the truck and park it at the job site, this creates additional problems – Where to park it? How to secure it? These issues may require a larger area of road closure to provide additional working space. In addition, removing and parking the trailer at the jobsite now creates the need for the operator to return at the end of the workday to pick up the trailer, and bring the tractor and trailer together at a suitable location to load the tractor onto the trailer. By this time, the work may have moved on down the road a significant distance from where the trailer was left parked. This creates

additional travel time and cost and could shorten the available working time in the day.

90. The '116 Patent deals with these problems by carrying the tractor on the support truck. The difficulty with this solution is that the support vehicle already contains a large amount of bulky equipment, which must be mounted, connected, and configured to operate as part of a system. In addition, placement of the heaviest components, such as the ultra high pressure pump and the water reservoir is constrained to be in certain locations to produce acceptable weight distribution on the support vehicle.

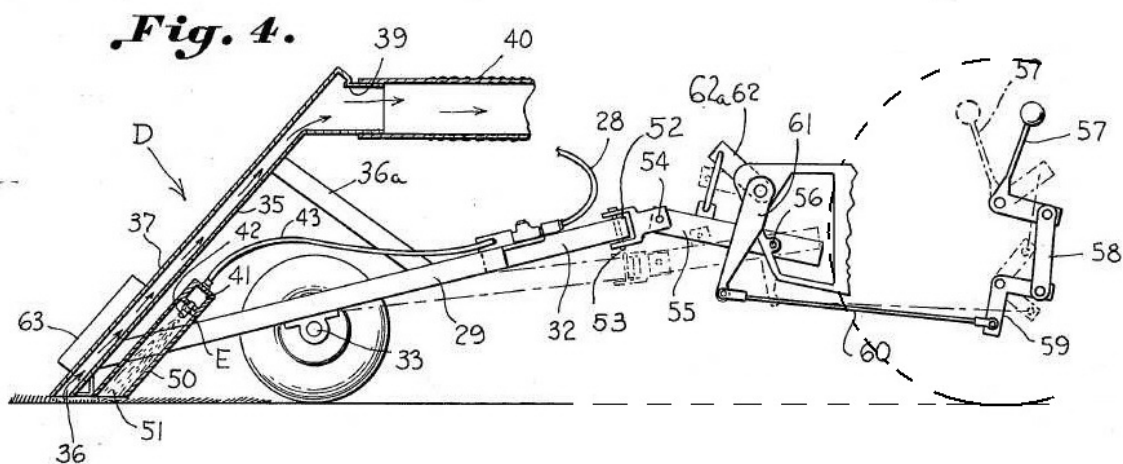
91. This produces a severe limitation on the possibilities for locations to carry the tractor. For instance, the ideal spot for the tractor would seem to be at the back of the truck, where it could be loaded from the rear. However, it is desirable to locate the reservoir at the back for weight distribution purposes.

92. Claim 5 solves these problems by docking the tractor “transversely on said bed portion of said truck.” Since the maximum allowable width of a vehicle on US highways is 8’ 6”, the '116 Patent discloses a method whereby “the blast head, 23, may be raised to the vertical position and then manually flipped up and back reducing the overall length to permit the tractor 20 and blast head 23 to be stowed on a truck bed sideways, consuming a space less than 8’ 6” for highway travel,” as shown in the photograph below, from a brochure produced by

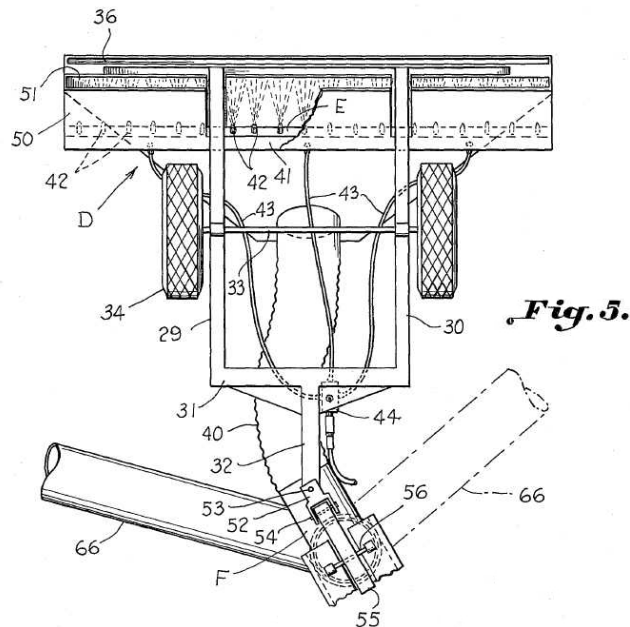
Waterblasting, LLC in January, 2004. The articulating link allows the blast head to be rotated up and back out of the way, and the articulating link is not disclosed by the prior art cited in the petition.



93. The Petitioner notes that Jones discloses that the cleaning head can rotate in both vertical and horizontal planes (Petition, p. 55), as shown below, based on Figure 4 from Jones.



94. He states that “the cleaning head of Jones can be “flipped up and back” about the transverse pin 54. (Petition, p. 55). However, Figure 4, above, shows that this rotation can only raise the head up about 8°, and the resultant length of the tractor and cleaning head is, if anything, actually longer after raising the head. He also states that the cleaning head of Jones can also be moved all the way to the right about bolt 53.” (Petition, p. 55). However, as shown in Figure 5 of Jones, shown below, this also increases the length of the vehicle with cleaning head. Therefore, a person of ordinary skill in the art would not understand Jones to teach the articulating link claimed in the ’116 Patent.

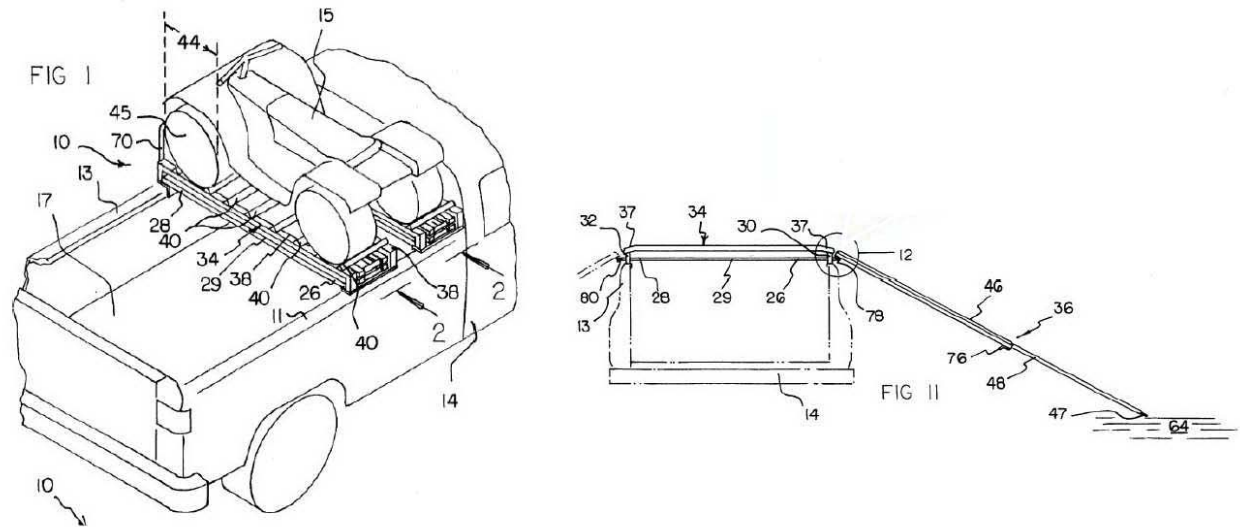


95. The Stripejet™ vehicle disclosed in NLB is identified as being 10' 2" long. The vehicles of both NLB and Jones are incapable of fitting transversely on a truck within the legal width, No mobile cleaning vehicles in existence when the '116 Patent was filed on July 2, 2004 have been disclosed which are capable of doing so.

96. Claim 6, is dependent on Claim 5, and thus to Claim 1. It discloses a "ramp pivotally connected to said bed portion . . . sized to support said tractor for docking transversely on said bed." A ramp practicing Claim 6 can be seen in the above photo on page 46 of a tractor docking transversely on a truck.

97.3 The petitioner has asserted that it would have been obvious to improve the bed portion of the truck in Jones by mounting thereon a retractable

ramp disclosed by Schrunk in US Patent 5,494,393 for a truck mounted vehicle-carrying apparatus, as seen below:



However, the “small vehicle” which Schrunk’s system is meant to carry does not include a mobile blast head, as required by Claim 5.

Ground 4: Claims 1 - 4 - *obvious based on Clemons in view of NLB*

98. The petitioner asserts that Claims 1-4 are obvious based on Clemons in view of NLB. His arguments are very similar to the arguments for combining Jones, Breither, and NLB, as discussed above. However, since Clemons includes a water reservoir, he does not include Breither in the combination of Clemons and NLB. But in addition to there being no motivation to combine the NLB reference with Clemons, neither of the references discloses the articulating link claimed in Claim 1 of the ’116 Patent.

99. Clemons discloses a self-propelled brushless surface cleaner which is a self-contained unit which sprays hot, pressurized water onto a surface to loosen dirt, rubber, oil, grease, etc.” (Clemons 1: 12-15). Clemons does not have the system separated into a motorized utility cleaning vehicle and a support vehicle, as does Jones, but the technology is similar in many respects. Neither one constitutes a “cleaning system,” that is, “a system for removing durable coatings which are tightly bonded to a hard surface by abrading away the hard surface by impacting it with high velocity water,” for reasons similar to those discussed above for Jones.

100. A person of ordinary skill in the art would not look to Clemons for concepts to combine with NLB to “remove removing durable coatings which are tightly bonded to a hard surface by abrading away the hard surface by impacting it with high velocity water.”

101. One who attempted to replace the pump, hoses, blast head, and other equipment on Clemons with the high-pressure equipment from NLB, as suggested by the petitioner, would be met with the same substantial design challenges that were discussed above for Grounds 1 regarding the Jones system. Just as it would require a large engineering design and development effort, involving a great deal of engineering expertise, man hours, and cost to reinvent the Jones system to be an ultra-high pressure stripe removal system, so too would it require a similar great effort and cost to reinvent the Clemons system to achieve the same objective..

102. Furthermore, neither Clemons nor NLB disclose an articulating link as required by Claim 1 of the '116 Patent.

Ground 5: Claims 5 - 6 - *obvious based on Clemons in view of NLB and Schrunk*

103. The petitioner builds on his combination of Clemons and NLB in Ground 4 and adds the retractable ramp assembly of Schrunk to assert that Claims 5 and 6 are obvious, using a similar argument to that used for Ground 3, which combined Jones, Breither, NLB, Herhold, and Schrunk. However, Clemons is not a “cleaning system” as disclosed in the “116 Patent.

VIII. MISCELLANEOUS MATTERS

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

Date: 10/25/18



Dr. Randall K. King, Ph.D., P.E.