United States Patent [19]

Grant

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[45] **Oct. 21, 1975**

[54] **SPRAY/JET WASHING DEVICE**

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[52] **U.S. Cl.** **239/198;** 239/287

[51] **Int. Cl.**[2] **B05B 3/00;** B05B 9/02

[58] **Field of Search** 239/287, 198

[56] **References Cited**

UNITED STATES PATENTS

2,638,730	5/1953	Davidson	239/287
2,692,163	10/1954	Geel	239/287
2,911,157	11/1959	Converse	239/287
3,423,027	1/1969	Small et al.	239/287
3,508,709	4/1970	Small et al.	239/287
3,788,273	1/1974	Tusch et al.	239/287

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[57] **ABSTRACT**

A machine for washing sand, leaves, small stones, stains, dirt and various other debris from the surface of tennis courts, driveways, parking lots and other hard surfaced areas by means of special purpose relatively high pressure jets and fans of water or other liquids comprising a network of conduits, valves are combined jet nozzle sets mounted bilaterally on the forward end of the base of a dolly's frame in such a manner that the nozzles and jets of each set lie one above the other in strict vertical alignment being angularly oriented from the vertical so as to provide three separate and distinct spray patterns to each side of the dolly which strike the wash surface at various acute angles at varying distances from the dolly. Selective valve operation permits either right side or left side operation as well as simultaneous left and right side operation. The effect of the nozzle jet arrangement is such that the side spray wash nozzle washes the area to its immediate front, thus forcing small debris outward and away from the dolly across the wash surface into the jet stream provided by the upper jet whereupon the debris upon entering ssid jet stream is forced and floated further away from the dolly to a distance greater than that which would have been achieved by the spray eminating from the wash nozzle alone. The lower jet which directs a narrow jet of liquied immediately behind the contact point of the wash nozzle's liquid spray fan and the wash surface serves to spread any puddles that collect on the wash surface, thereby materially assisting in reducing the drying time of the wash surface.

4 Claims, 7 Drawing Figures

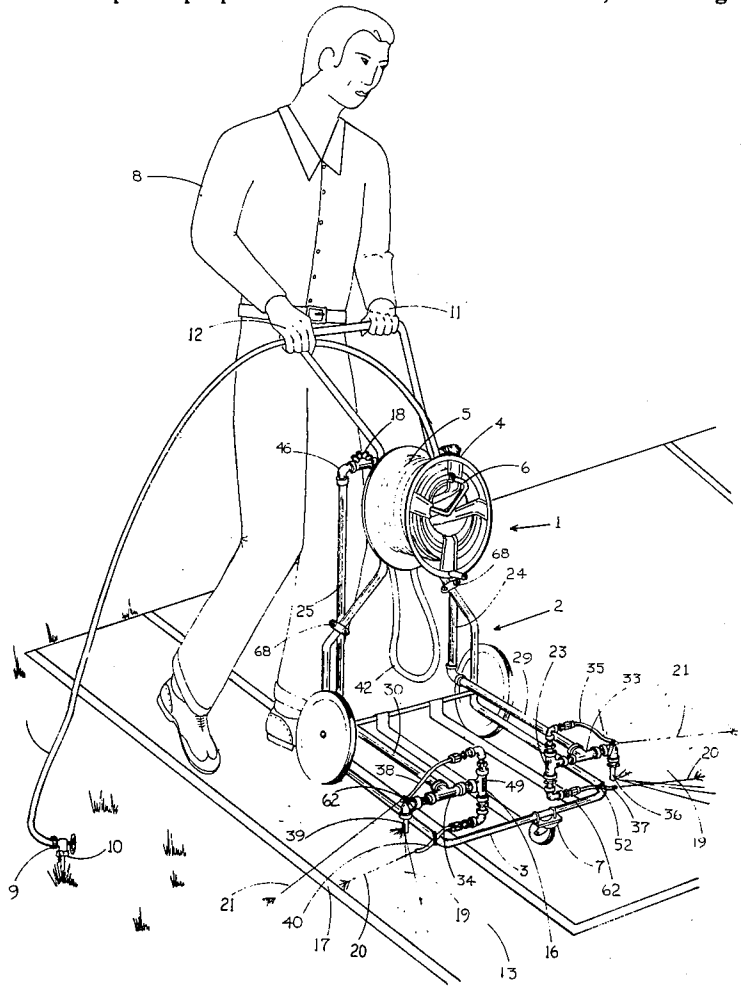
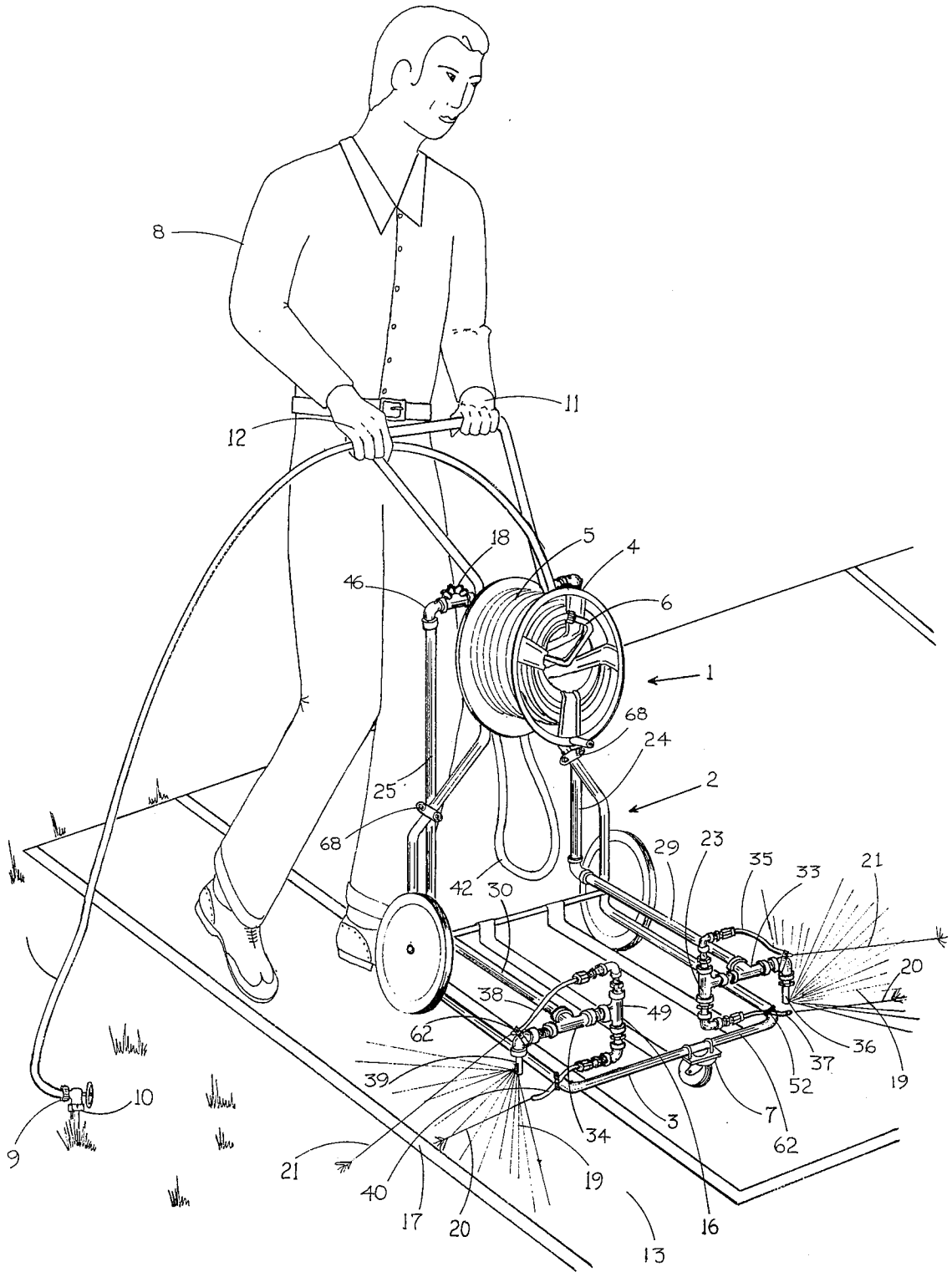


FIG. 1


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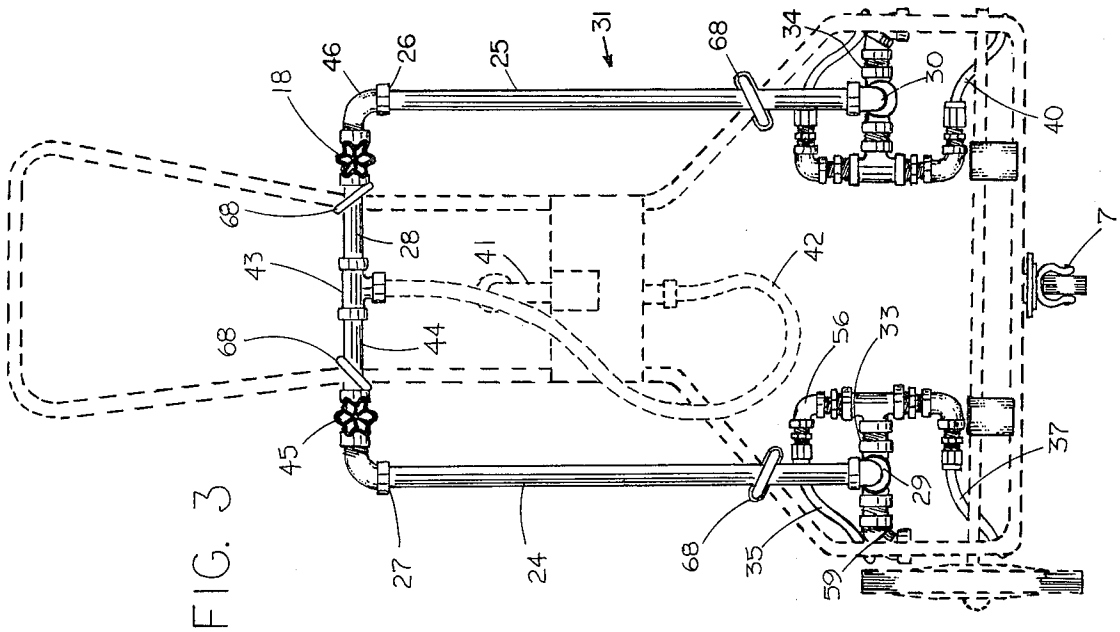

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FIG. 3

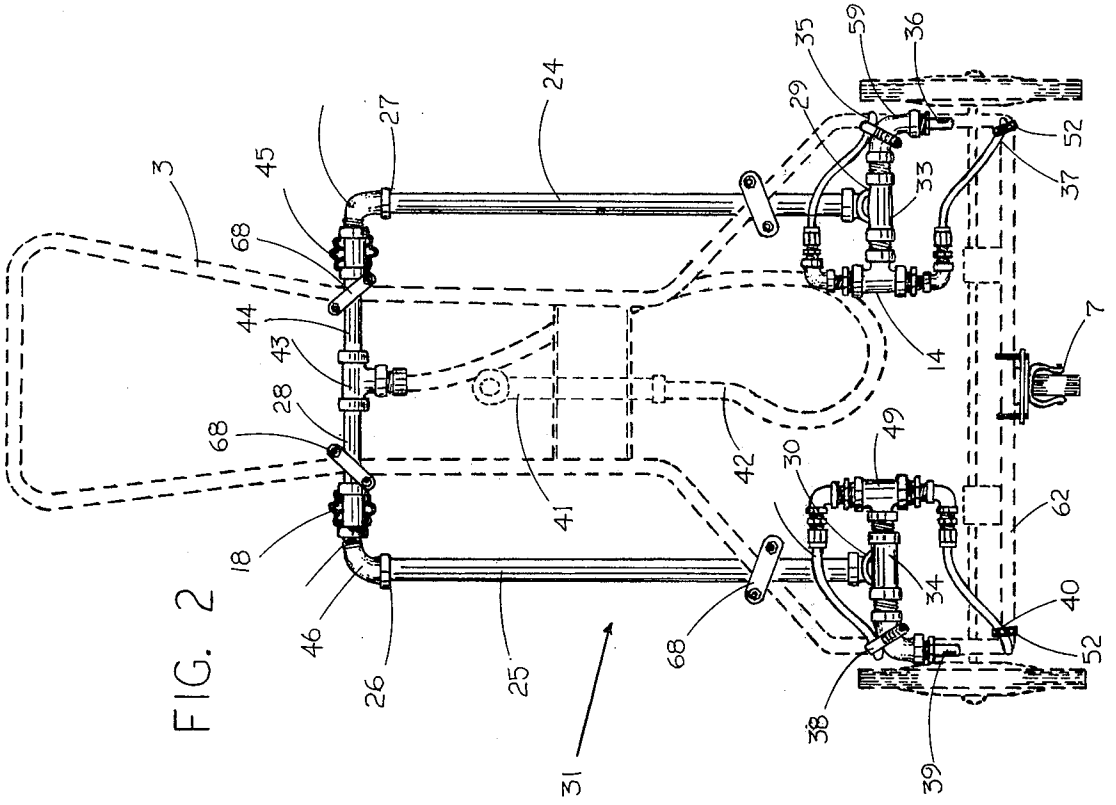

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FIG. 2

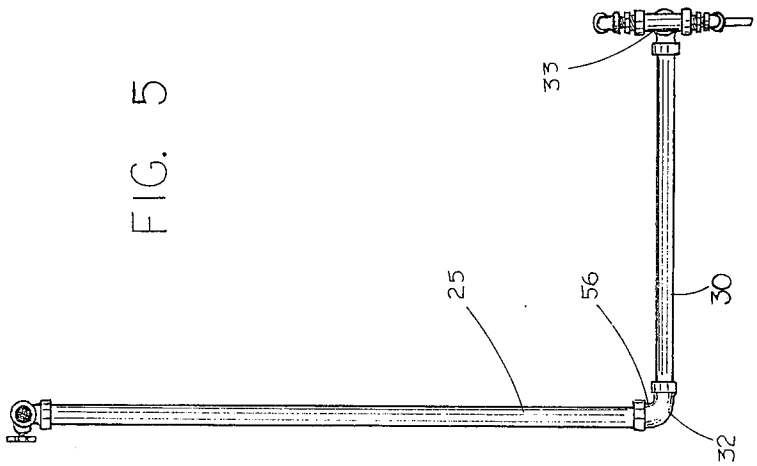


FIG. 5

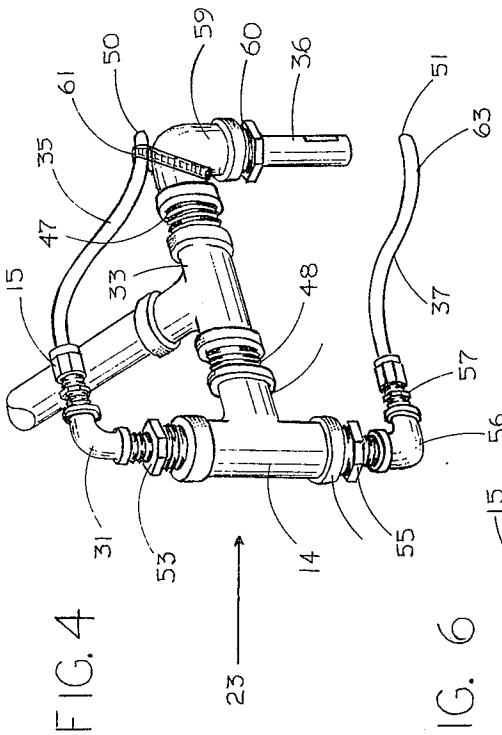


FIG. 4

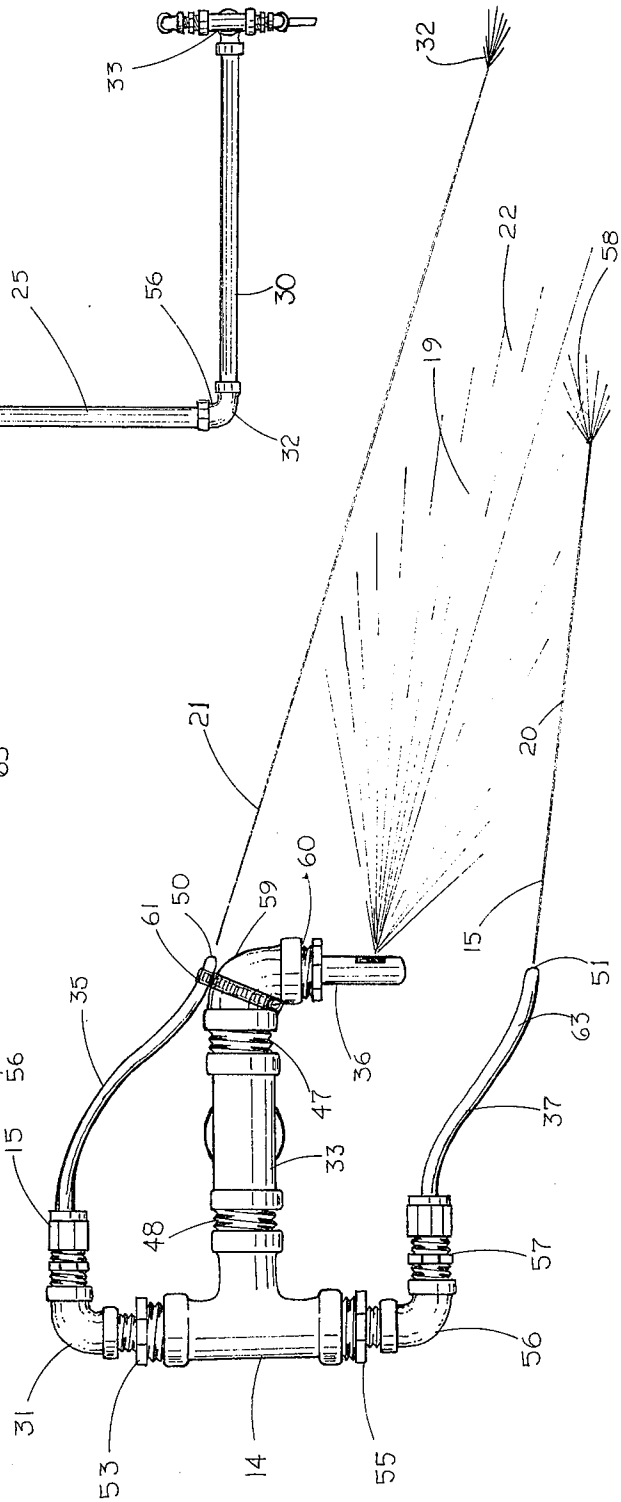


FIG. 6

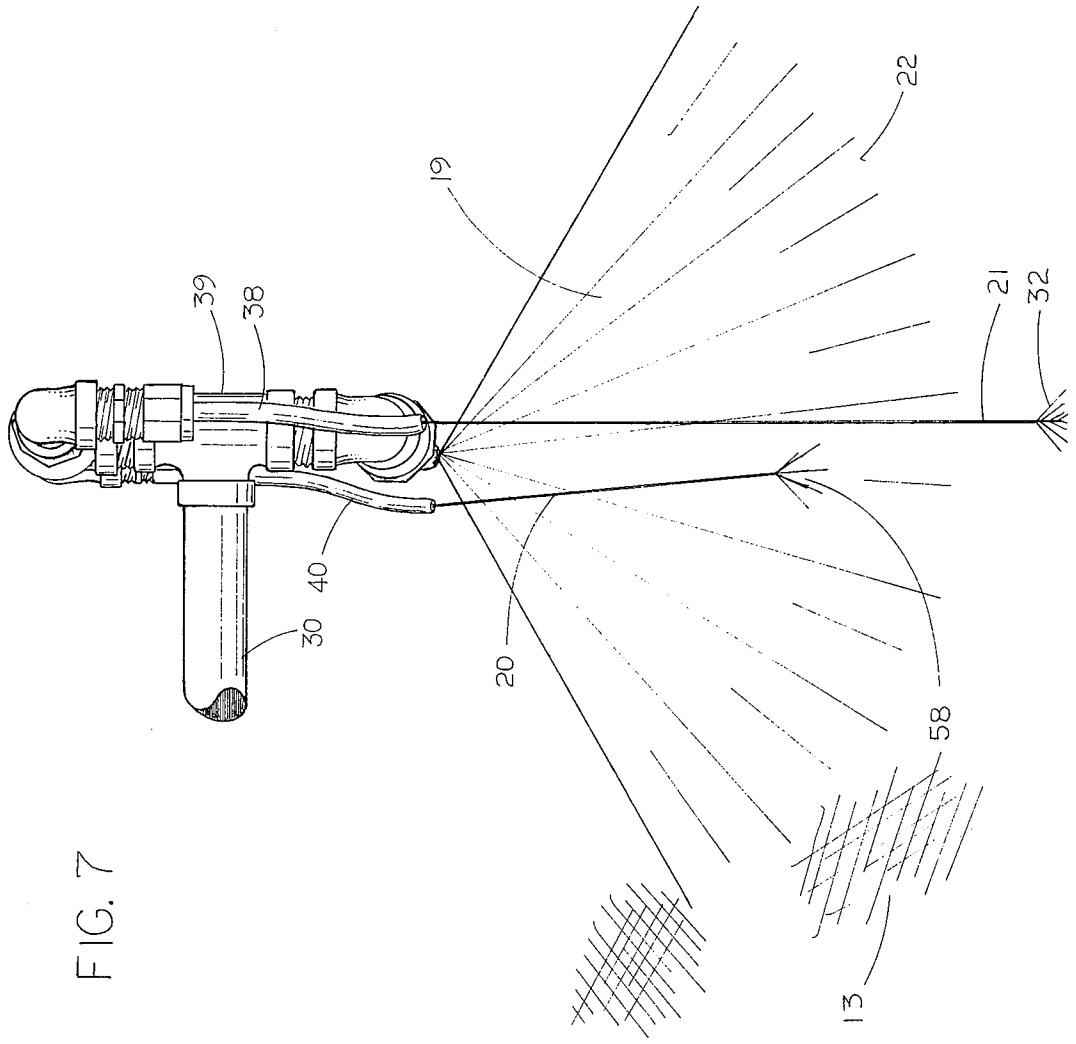


FIG. 7

SPRAY/JET WASHING DEVICE

BACKGROUND OF THE INVENTION

Since the advent of out-of-door hard stand areas, such as tennis courts, basketball courts, parking lots, driveways, service station servicing areas, etc., there has existed a need for the frequent washing and cleaning of their surfaces. The most normal and effective process employed to date to effect such cleaning has been to hose down the hard stand area with a garden hose. This method of cleaning, while being generally effective, has notable shortcomings in that an excessive amount of water is expended, puddling occurs in low spots across the surface of the hard stand, thus retarding drying, some areas escape being washed thoroughly by direct spray as they are overlooked by the operator of the hose due to blending of the color tones of the hard stand area when it becomes wet by drifting spray and because the hosing down of a hard stand area is exceedingly time consuming. Additionally, it is noted that the use of a garden hose for hosing down hard stand areas is also undesirable from the operator's standpoint in that many and varied manipulations of the length of the hose are required to cover a large hard stand area and such manipulations, in addition to trapping debris along the length of the hose, cause the operator to become wet and uncomfortable.

The present invention provides a water spray/jet device that washes any given hard stand area with minimum water/fluid usage in approximately one third the time normally required to hose down the area. Further, it provides features whereby puddles are dispersed to assist drying, the length of the hose supplying the wash fluid does not interfere with the wash process, complete coverage of the wash area by high pressure spray is assured and operator personnel remain dry and comfortable during all phases of the wash operation. The invention has the additional advantage of being mounted in conjunction with conventional hose reel dollies.

SUMMARY OF THE INVENTION

The present invention relates to a new and unique tap pressure fluid spray and jet washing device mounted on a multiwheeled tubular frame with a hose reel dolly that effectively washes such hard stand areas as outdoor tennis and basketball courts, driveways, parking lots, service station servicing areas, etc., in a minimum amount of time with a minimum expenditure of wash fluid while providing maximum operator comfort.

An important object of this invention is to provide a tap pressure spray and jet washing device that materially assists in removing puddles from hard stand wash areas, thereby reducing drying time of the wash area.

Another object of this invention is to provide a tap pressure spray and jet washing device that propels small foreign objects, litter and debris substantially away from the wash area.

A further object of the present invention is to provide a tap pressure spray and jet washing device that is both efficient and economical to operate.

Yet, another object of this invention is to provide a tap pressure spray and jet washing device that cleanses the surface of the wash area as well as ridding it of loose debris.

A still further object of this invention is to provide a tap pressure spray and jet washing device that can be readily adapted to conventional hose reel dollies and may easily be propelled, manipulated and operated by a single operator.

A further object of the present invention is to provide a tap pressure spray and jet washing device that provides maximum operator comfort by effectively minimizing operator contact with sprayed fluids.

Yet, another object of the present invention is to provide a tap pressure spray and jet washing device that materially reduces the times required to wash hard stand areas by currently employed methods.

An additional object of the present invention is to provide a spray/jet washing device that provides sufficient water pressure to cleanse a hard stand area without the employment of means to raise employed water pressures above that normally provided by city tap pressures.

These and other objects are accomplished according to the present invention which comprises a network of conduits, values and combined jet/nozzle sets mounted bilaterally on a multi-wheeled tubular frame with a hose reel dolly of otherwise conventional design, in essence, comprising as an entity a tap pressure spray and jet washing device for use on outdoor tennis courts, basketball courts and other hard stand areas.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view showing a preferred embodiment of the current invention.

FIG. 2 is a front plan view of the plumbing network installed on a dolly.

FIG. 3 is a rear plan view of the bilateral nozzle installation.

FIG. 4 is a perspective view of a nozzle assembly.

FIG. 5 is a side plan view of the tubular conduit frame.

FIG. 6 is a side plan view of nozzle assembly.

FIG. 7 is a top oblique view of water patterns produced by the present invention.

In the drawing wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views the complete device is designated **1**. The rigid conduit framework is designated **2**, the right nozzle assembly **16** and the left nozzle assembly **23**.

FIG. **1** shows a preferred embodiment of the present invention **1** which, in essence, comprises a dual plumbing network of valves, conduits, and left and right nozzle arrangements mounted by U-clamps **68** on a hose reel dolly **3** of previous art. Said dolly **3** providing a quick disconnect reel **4** for the storage of a length of garden hose **5**, an integral swiveled conduit **6** which permits the transfer of fluids from the reel stored hose **5** through the swiveled conduit **6** to a female hose connector (not shown) which is firmly affixed to the dolly's frame. A forward castered wheel **7** has been added to the dolly **3**, thus converting it into a tricycular cart. Operation of the present invention is accomplished by a single operator **8** in the following manner: The operator first connects the free end **9** of the reeled hose **5** to a water source, such as water faucet **10** and opens said faucet to its maximum, thus allowing the pressurized tap water to flow to all points within the system. The

cart is then pushed to the area to be cleaned by the operator using his left hand **11** to push the cart and his right hand **12** to assist the unwinding or play out of the reeled hose **5** from the reel **4.** Upon reaching the area to be cleaned, the operator **8** positions the cart **3** on the surface to be cleaned **13** in such a manner that the longitudinal axis of the cart **3** is parallel with the longitudinal edge of the surface to be cleaned **13** and at a distance of approximately 4 feet inboard from the edge of said surface. The operator at this point activates the right spray and jet nozzle assembly **16** which is now facing the outer edge **17** of the surface **13** by opening of the right activating valve **18.** Upon opening of the activating valve **18,** three separate and distinct water patterns **19, 20** and **21** are ejected onto the surface **13** toward its outer edge **17,** whereupon the operator **8** pulls the cart **3** rearward keeping its longitudinal axis parallel to the outer edge **17** of the surface to be cleaned **13,** so as to clean that part of the surface which was lying rearward of the spray and jet water patterns. The operator **8** then reverses his direction and pushes the cart **3** forward with his left hand **11** playing out hose **5** as required with his right hand **12** to allow for distance traveled while maintaining the cart's longitudinal axis parallel with the longitudinal axis of the outer edge **17** of the surface **13** to be cleaned until he reaches its longitudinal terminus at which point he manipulates the cart **3** angularly in such a manner that all remaining debris and dirt at his location are forced off of the side and end of surface **13** whereupon he turns off the spray and jet patterns he has been using and moves the cart **3** a cart's width into the area he has just cleaned aligning the longitudinal axis of the cart **3** so that it is parallel with the longitudinal axis of the tract he previously traveled across the surface of the area to be cleaned **13.** Once the cart has been so placed and aligned, the operator **8** activates the left spray nozzle assembly **23,** then pulls the cart **3** rearward cleaning the area to his left as he proceeds back across the area to be cleaned until he reaches the edge of area from which he originally started, whereupon he maneuvers the cart **3** into the area just cleaned to such a position that the cart's longitudinal axis is parallel with the previously traversed path and the nozzles of the left activated spray assembly **23** are approximately 18 inches distant from the dirt line of the area not yet clean. The operator then pushes the cart **3** across the area he is cleaning, whereupon he repeats and continues the process previously described until he has traversed the entire area, thus removing all dirt and debris from said area

Reference FIGS. **2, 3** and **4,** the present invention **(1)** comprises a rigid tubular conduit framework composed of two parallel "L" shaped conduits **24** and **25** spaced laterally apart which are joined at their upper terminus **26** and **27** by rigid cross conduits **28** and **44** in such a manner that the cross conduit's longitudinal axis is perpendicular to the "L" shaped conduits' vertical axes, thus, in essence, forming a vertical rectangular conduit framework closed at its upper terminus by cross conduits **28** and **44** and evolving at its lower terminus into two parallel and rigid conduits **29** and **30** which are connected perpendicularly to the rectangular conduit's framework at its lower terminus, said parallel and rigid conduits **29** and **30** terminating into tee-shaped manifolds **33** and **34** upon which are mounted a plurality of special purpose nozzles, each of which, when activated, producing unique jet patterns. Fluids are directed to the present invention **1** from a suitable source, such as water faucet **10,** which in turn is in communication with garden hose **5** which communicates directly with conduit **41,** a component part of hose dolly **3** of previous art which in turn is in communication with a length of garden hose **42** which communicates with manifold **43** (a tee fitting) which divides and directs the flow of liquids through conduits **44** and **28,** which in turn are in communication with left and right gate valves **45** and **18** respectively. Said gate valves **45** and **18** may be opened singularly or simultaneously depending upon the operator's desires for left or right operation of the spray jets and nozzles or for simultaneous left and right operation of the spray jets and nozzles. Opening of the gate valve **18** permits passage of pressurized tap fluids into pipe elbow **46** to and through conduit **25,** elbow **56** and conduit **30** to manifold **34** (a tee fitting) whereupon fluid flows are divided and directed to wash nozzle **39** and to and through manifold **49,** a tee fitting, to repulsion jet **38** and drying jet **40** whereupon the fluid is ejected from said nozzles and jets onto the surface **13** to be cleaned.

FIGS. **5,6,7,** the left and right nozzle and jet assemblies are, in essence, mirror images one of the other and produce identical spray patterns on opposite sides of cart **3.** Therefore, to simplify discussion, description of the composition and operation of the nozzle assemblies will be limited to a discussion of the left nozzle assembly. Said assembly comprises three separate and distinct nozzles which operate simultaneously, a wash nozzle **36** ejects a broad fan knife edge spray **19** which strikes the surface of the wash area **13** at a narrow acute angle of approximately 15° stripping dirt and debris from said surface and propelling it a short distance away from its original location in the direction of the spray. The repulsion jet **35** which is located above and in vertical alignment with the wash nozzle **36** ejects a narrow jet stream **21** which strikes the surface of the wash area **13** at an acute angle of approximately 30° at point **32** slightly forward of the wash nozzle's broad fan spray's point of impact **22** with the wash surface **13** contacting the dirt and debris dislodged by the wash nozzle's broad fan spray **19** and propelling it a considerable distance from cart **3** in the direction of the repulsion jet's jet stream **21.** The drying jet **37** which is located below and in vertical alignment with the wash nozzle **36** ejects a narrow jet stream **20** which strikes the surface of the wash area **13** at a narrow acute angle of approximately 5° at a point **58** slightly rearward of the wash nozzle's broad fan spray's point of impact **22** with the wash surface **13,** scattering any and all puddles of fluid that have collected on wash surface **13,** thus materially aiding the drying process of wash surface **13.** Essentially, the nozzle jet assembly **23** consists of a body section composed of pipe tee **33** which performs two functions. The pipe tee **33** serves as a main mounting platform for all of the components of the nozzle system and also serves as a manifold to feed the vertically mounted nozzles and jets **35, 36** and **37.** Pipe unions **47** and **48** extend laterally from the ends of pipe tee **33** and serve as connecting means on the right **47** for elbow **59** which incorporates wash nozzle **36** into its lower terminus **60.** Elbow **59** also serves as a stabilizing and alignment mount for repulsion jet **35** which is fastened to upper surface of elbow **59** by adjustable strap clamp **61.** Pipe union **48** extends from the left end of pipe tee **33** to serve as the connecting link between pipe tee **33**

and pipe tee **14** which serves the purposes of acting as a mountingbase and as a manifold for repulsion jet **35** and drying jet **37.** Connections from pipe tee **14** to the repulsion jet **35** consist of pipe union **53** and a 90° pipe elbow **31** which by suitable attachment fittings **15** is connected in turn to repulsion jet **35,** which, in essence, is a length of copper tubing of small diameter, said jet being firmly attached to the upper surface of elbow **59** near its outer terminus **54.** It is noted that repulsion jet **35** is mounted in such a manner that the outer terminus of elbow **59** extends outward from the cart **3** to a greater distance than does the tip of repulsion jet **35.** This special arrangement prevents the repulsion jet **35** from being bent out of alignment by contact with foreign objects. Connections from pipe tee **14** to the drying jet **37** consists of a pipe union **55** and a 90° elbow **56** which by suitable attachment fittings **57** is connected in turn to the drying jet **37,** which, in essence, is a length of copper tubing of small diameter, said jet being firmly attached near its outer terminus **63** to the upper surface of frame member **62** by clamp **52** so as to maintain permanent alignment. It is further noted that the tip **51** of drying jet **37** is located at a distance short of the extension of the outer wall of elbow **59** to preclude its being knocked out of alignment by contact with foreign objects.

Alignment of the nozzles **35, 36** and **37,** is accomplished by first setting the spray pattern **19** of the wash nozzle **36.** when in proper alignment, the wash nozzle **36** projects a ground spray pattern that reflects spray an equal distance laterally to each side of said wash nozzle **36.** Should the spray patterns be out of alignment, wash nozzle elbow **59** is rotated either clockwise or counter-clockwise depending upon the direction needed to produce ground spray patterns of equal length laterally to both sides of wash nozzle **36.** Once the proper wash nozzle adjustment has been accomplished, adjustment of the repulsion jet **35** and the drying jet **37** is possible. To adjust the repulsion jet **35,** strap fastener **61** is loosened slightly and the repulsion jet **35** is tapped lightly either to the right or left of its longitudinal axis depending upon the direction of adjustment desired so that the point of ground contact **32** of its ejected jet stream **21** precisely bisects the fan shape ground pattern **19** projected by the wash nozzle **36.** Once this lateral alignment has been obtained, strap fastener **61** is retightened to maintain the set alignment. Verti-adjustment of the repulsion jet **35** is accomplished by tapping the tip **5** of the repulsion jet **35** slightly upward or downward depending upon the longitudinal direction of movement of the point of cantact **32** of the repulsion jet's ejected stream **21** with the surface of the wash area **13** outward from the cart **3** or inward toward the cart **3.** Upward tapping of the tip **50** of the repulsion jet **35** moves the point of ground impact **32** of the jet's ejected stream **21** outward along the stream's longitudinal axis. Downward tapping of the tip **50** of the repulsion jet **35** moves the point of contact inward along the stream's longitudinal axis. Proper setting of the repulsion jet's longitudinal point of contact **32** with the wash surface **13** places said point of contact **32** approximately 6 inches outward from the point of ground contact **22** of wash nozzle **36** spray pattern **19.**

The procedures for the lateral and longitudinal adjustment of the drying jet **37** follows precisely the adjustment procedures described above for the repulsion jet **35.** Proper adjustment of the drying jet **37** is obtained laterally when the drying jet's ejection stream **20** precisely bisects the fan shaped ground pattern **19** projected by the wash nozzle **36.** Longitudinal adjustment is obtained when the repulsion jet's ejected stream **21** contacts the wash surface **13** at a point approximately 6 inches behind the point of surface contact **22** of the wash nozzle's spray pattern **19.**

Various changes may be made to the form of the invention herein shown and described without departing from the spirit of the invention or scope of the claims.

Having described this invention, what I assert as new and pray issuance of letters of patent for, is:

1. A device for washing and sweeping planer surface areas which is adapted to be mounted on a multi-wheeled vehicle and comprising: two "L" shaped conduits joined together at one end and adapted to receive a common source of washing fluid, the longer leg of each conduit extending parallel to the other and each being joined at its other end to a further horizontal conduit extending at roughtly right angles thereto, said horizontal conduits projecting in the same plane and parallel to one another and terminating in a set of three nozzles, each set of nozzles being generally directed outwardly in a direction perpendicular to said horizontal conduits; and each set of nozzles comprising: (1) a wash nozzle adapted to eject a broad fan knife edge spray which strikes the surface of the wash area at an angle of about 15°, (2) a repulsion jet nozzle disposed above and in verticle alignment and with said wash nozzle adapted to eject a narrow stream of fluid at an angle of about 30° to the surface of the wash area and at a point slightly forward of the wash nozzle spray and, (3) a drying jet nozzle disposed below and in vertical alignment with said wash nozzle and adapted to provied a narrow jet stream which strikes the surface of the wash area at an angle of about 5° thereto at a point slightly rearward of the wash nozzle spray.

2. The device of claim **1** which is adapted to be mounted on a hose dolly provided with a plurality of wheels.

3. The device of claim **2** wherein said hose dolly has two larger wheels disposed at the rear thereof and a smaller pivoting wheel disposed at the front of the dolly.

4. The device of claim **2** wherein the supply of washing fluid to each of said set of nozzles is independently controlled by a separate valve means.

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