

EXHIBIT

Blasters-1002

[54] **ARTIFICIAL TURF CLEANER**

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[51] Int. Cl. **A47I 7/00**

[58] Field of Search **15/314, 320, 321, 340, 15/354, 381**

[56] **References Cited**

UNITED STATES PATENTS

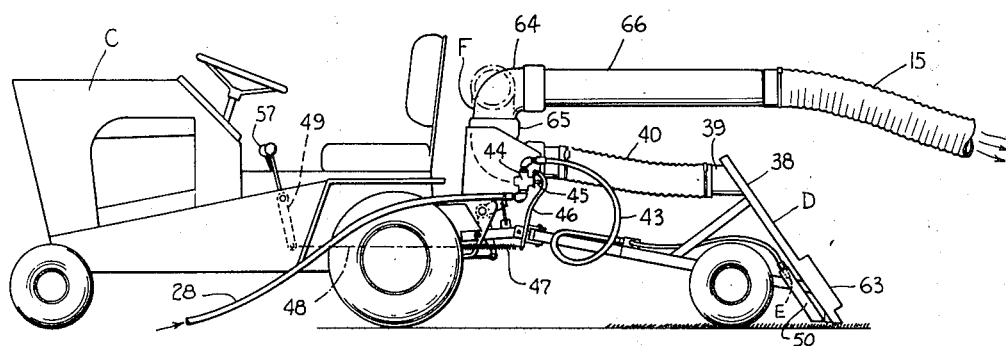
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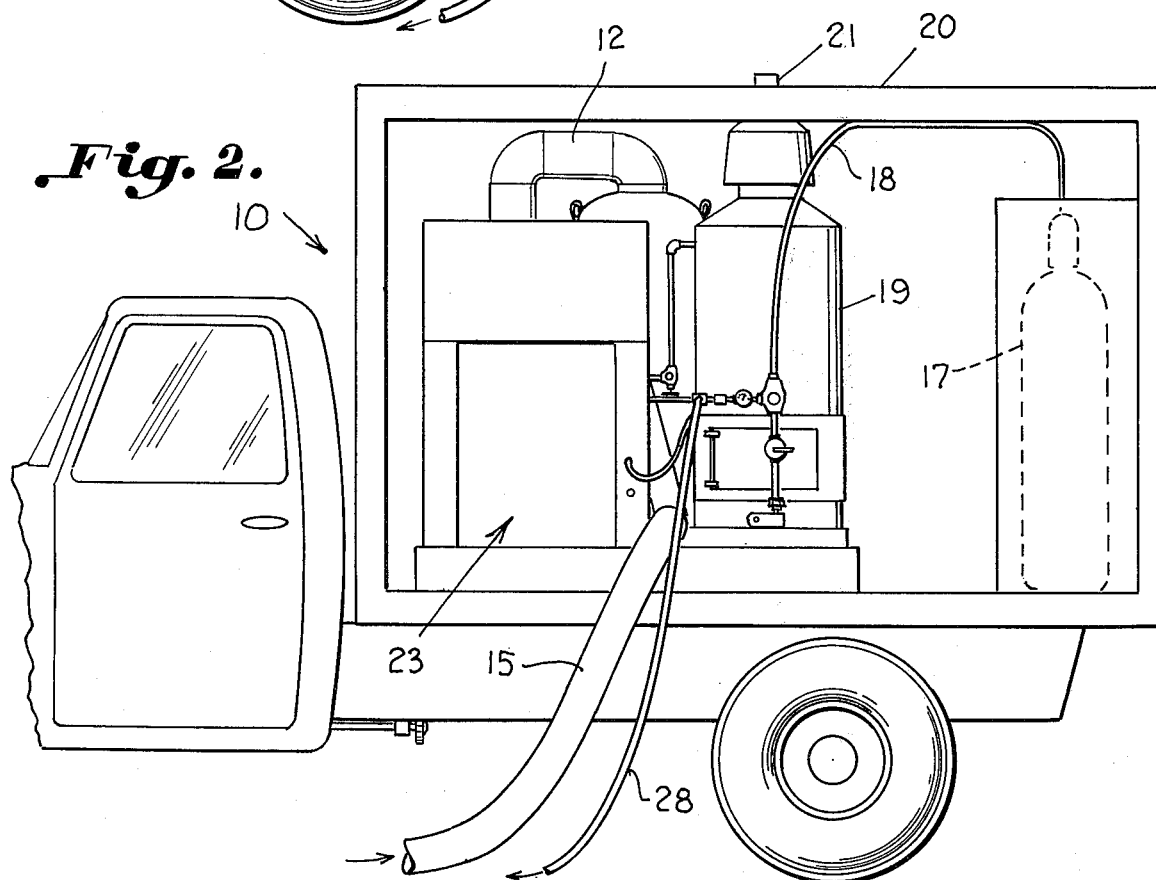
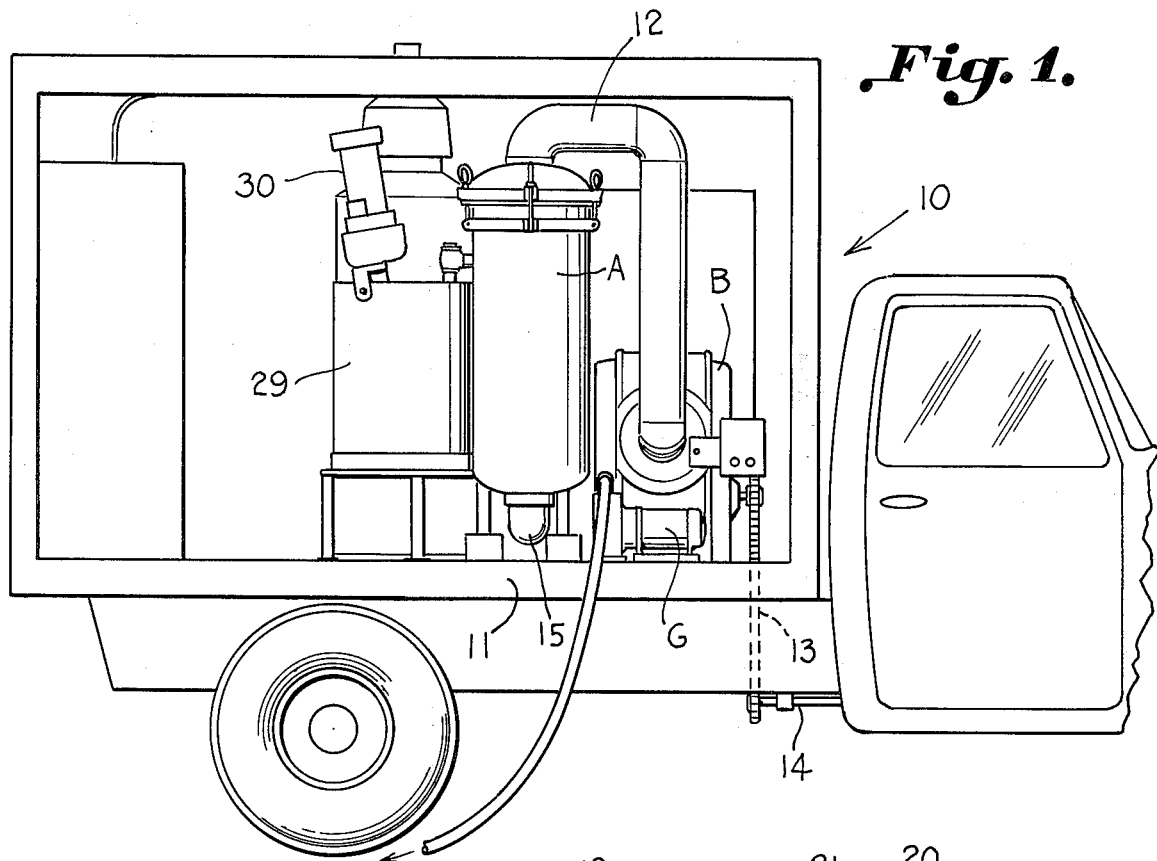
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[57] **ABSTRACT**

A portable device for cleaning artificial turf which utilizes a cleaning head having a suction nozzle and spray nozzles which is pulled behind a motorized utility vehicle. A truck is parked adjacent the edge of the field upon which the artificial turf is located and contains a vacuum pump, water heater, pressure booster chemical injection systems, and an electrical system which supplies the utility vehicle with hot cleaning medium and suction for removing the spent cleaning solution through the nozzle pulled thereby. A swivel is provided adjacent the cleaning head for supporting a large suction hose above the cleaning head so that the utility vehicle can be readily driven about the field.

3 Claims, 6 Drawing Figures





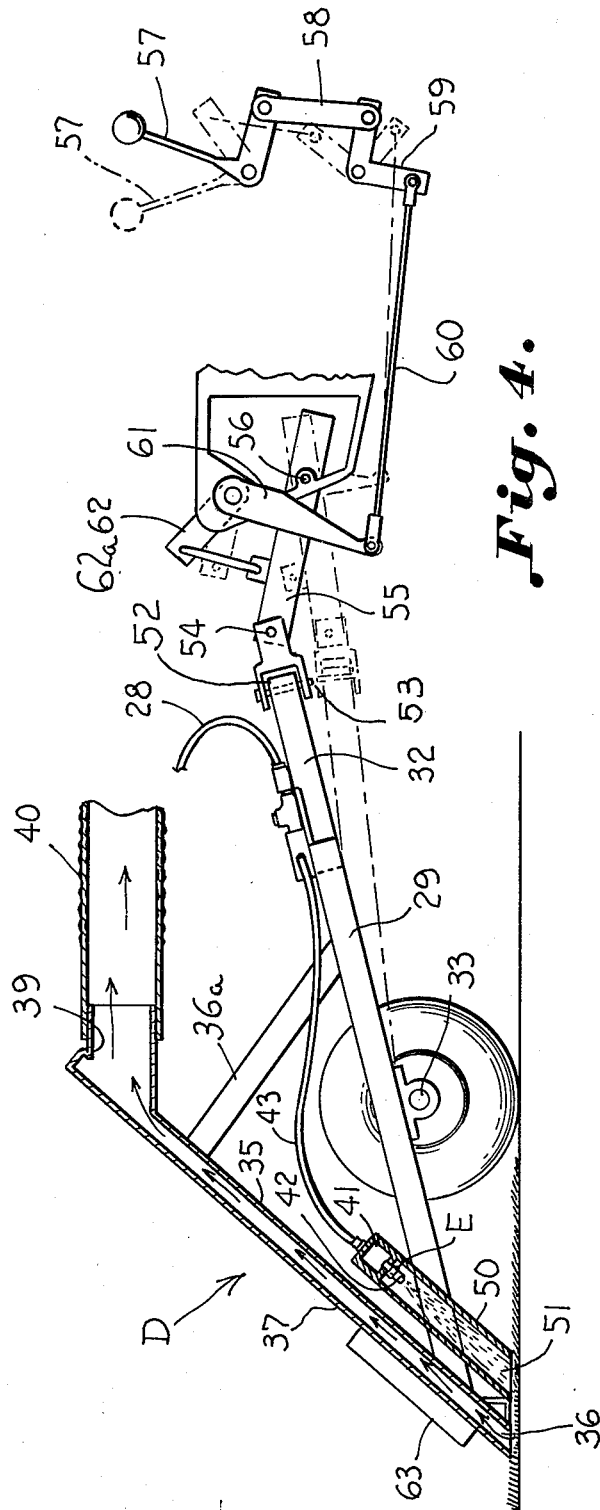


Fig. 4.

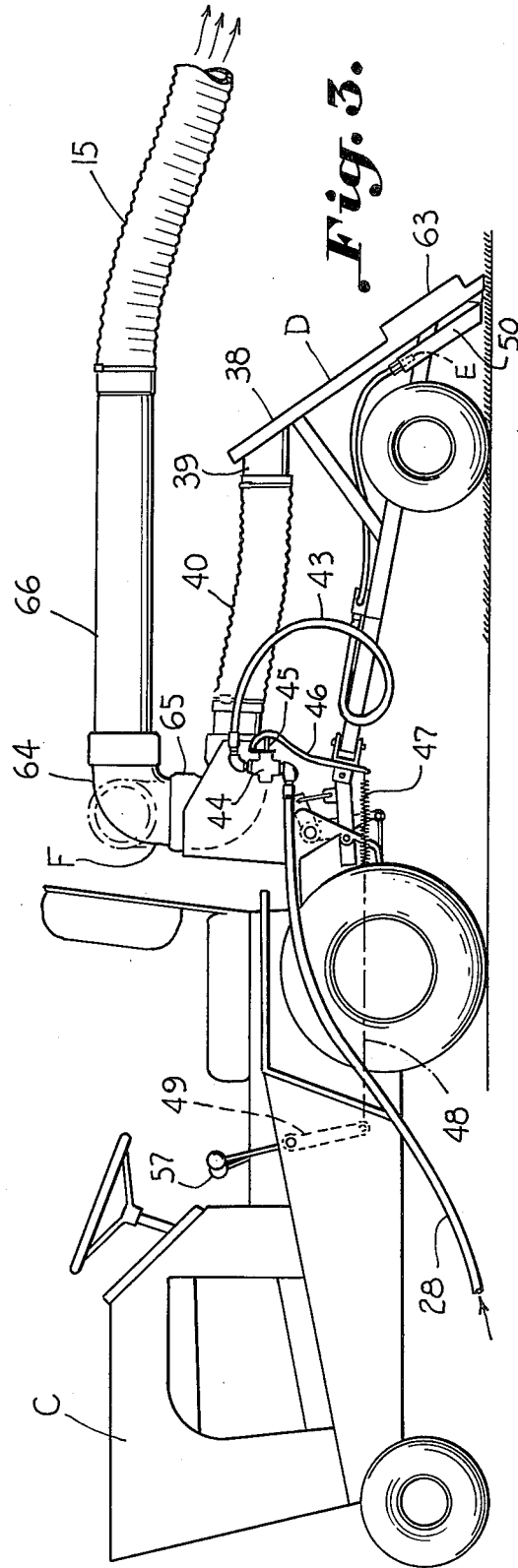


Fig. 3.

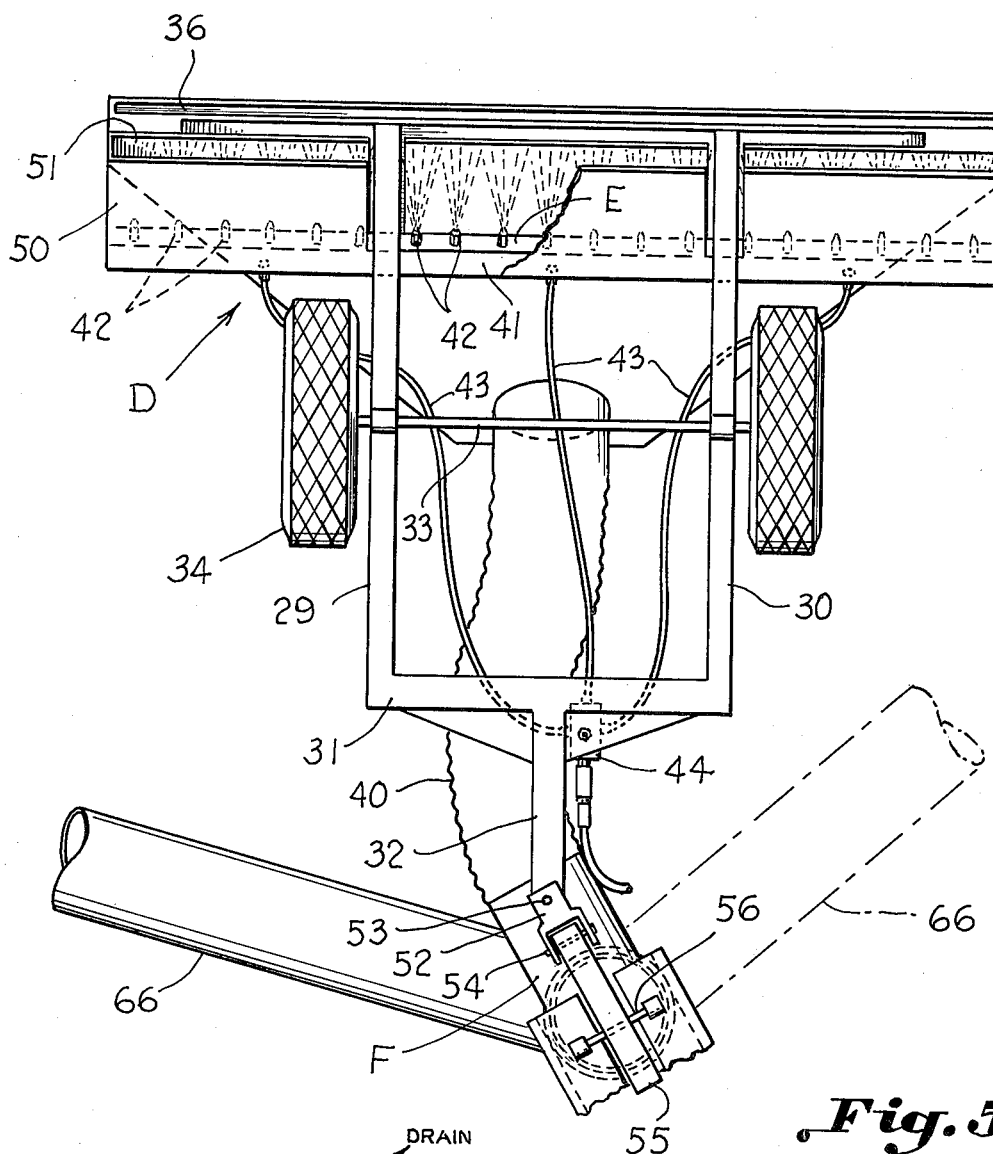


Fig. 5.

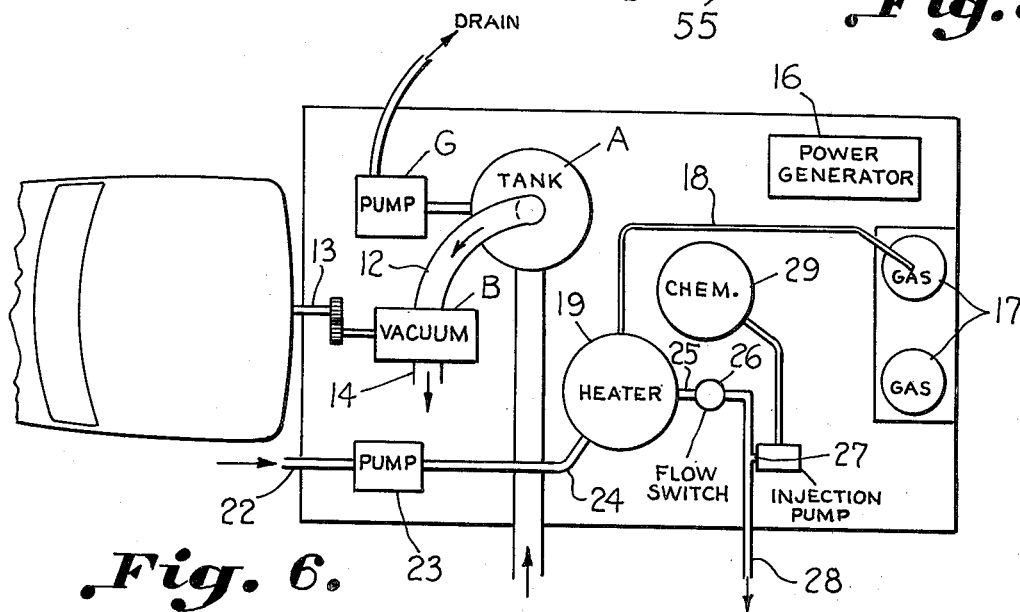


Fig. 6.

ARTIFICIAL TURF CLEANER

This invention relates to a cleaning apparatus, and more particularly to an apparatus designed for cleaning large fields having artificial turf thereon.

In recent years artificial turf on football fields, tracks, etc., has become very popular due to the low maintenance and uniformity. One of the problems encountered with such field, particularly in areas of high pollution, is that foreign matter, such as oily fallout, soot, broken glass, and other hazardous materials collect on the artificial turf. The oily fallout and soot make the artificial turf slippery creating hazardous conditions for athletes utilizing the field. The glass and other matter collecting on the field, of course, would also be injurious to the athletes.

Furthermore, as the foreign matter collects on the field, bacteria and the like tend to increase, possibly infecting skinned elbows and knees of the athletes.

Another problem that arises with the use of such artificial turf fields is that after heavy rains water will tend to collect in puddles hindering the ability of the athletes running thereon.

Accordingly, it is an important object of the present invention to provide a portable device for cleaning large areas having artificial turf and the like thereon.

Another important object of the present invention is to provide a motorized cleaning apparatus which is capable of traversing a large field having artificial turf thereon with a minimum of interference from water and suction hoses accompanying such.

Another important object of the present invention is to provide a motorized cleaning device with a cleaning head for cleaning outdoor fields having artificial turf thereon, which encloses the hot cleaning medium being sprayed on the turf for minimizing the temperature drop therein.

Other objects and advantages of this invention will become more apparent from a reading of the following detailed description and appended claims taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a side elevational view of a supporting vehicle for the portable cleaning device,

FIG. 2 is a side elevational view taken from the other side of the supporting vehicle shown in FIG. 1,

FIG. 3 is a side elevational view illustrating the motorized utility cleaning vehicle,

FIG. 4 is an enlarged side elevational view, partially in section, illustrating a cleaning head utilized with the motorized utility vehicle,

FIG. 5 is an enlarged plan view taken from the bottom illustrating a cleaning head constructed in accordance with the present invention,

FIG. 6 is a schematic plan view illustrating the location of the various components on the service truck and the flow of air and cleaning medium therethrough.

Referring in more detail to the drawings, there is illustrated a portable device for cleaning artificial turf on athletic fields and the like, utilizing a cleaning medium. The device includes a tank A with a vacuum hose having one end coupled to and communicating with the tank A. A vacuum pump B communicates with the tank A causing a large volume of air to be drawn through the hose. A motorized utility vehicle C carries the other end of the vacuum hose for traversing the athletic field. An elongated transverse cleaning head D is carried by the motorized vehicle C with a suction nozzle forming a part thereof. The suction nozzle communicates with

the other end of the vacuum hose circulating air in large volume through the nozzle and the tank A. A sprayer means E is carried adjacent the suction nozzle for spraying hot cleaning medium on the turf ahead of the suction nozzle as the head is passed across the turf. A housing encompasses the sprayer means E and has an elongated opening closely adjacent the turf for encasing the hot cleaning medium as the cleaning medium is sprayed on the turf for minimizing the temperature lost during the cleaning operation. A swivel support F is carried by the motorized vehicle C for supporting the vacuum hose in order to permit the vehicle to turn under the hose as such traverses the field. A means G communicates with the base portion of the tank for conveying away the liquid and any foreign matter removed from the turf.

The tank A and vacuum pump B are carried on the support vehicle, generally designated by the reference character 10, which has a covered flat bed body 11 carried on the rear thereof. Normally, the support vehicle 10 is driven on the athletic field and parked adjacent the central side line. The motorized vehicle C then begins to clean outwardly therefrom. It has been found in some instances that it is not desirable to drive the heavy motorized vehicle onto the artificial turf since it may pack down some of the cushioning used thereunder.

The vacuum tank A is an upright tank provided by receiving the spent cleaning solution collected from the field being cleaned. Communicating with the top of the vacuum tank B is a vacuum hose 12, which extends to the input of the vacuum pump B. The vacuum pump B is a positive displacement pump which is driven by a power take-off 13 coupled to the drive shaft 14 of the support vehicle. Therefore, the engine of the support vehicle 10 is used for driving the vacuum pump B. The exhaust from the vacuum pump B is vented out below the truck through a hose 14a. The pump G is connected to the bottom of tank A by conduit 12a for removing the collected fluid therefrom.

Communicating with the bottom of the tank A is an elongated vacuum hose 15 which extends to the cleaning head D carried by the motorized vehicle C. This vacuum hose 15, in one particular instance is 200 feet long so that when the support vehicle is parked adjacent the central side lines of a normal football field the motorized vehicle can clean outwardly therefrom to cover substantially all of the artificial turf. The support vehicle 10 as shown in FIG. 6, is self contained and includes a gasoline operated power generator 16 which generates electric power for operating various pumps in the system. It is also provided with tanks 17 of propane gas which is fed by a tube 18 to a gasoline operated heater 19 which heats the water used in cleaning the field. The heater 19, as shown, is vented through the top 20 of the truck by means of a chimney 21.

Cold water is supplied to line 22 shown in FIG. 6 from any suitable source on the field being cleaned and is fed through an electrically operated pressure booster pump 23 which builds the pressure of the water to approximately 200 pounds per square inch. This pressurized water is fed through piping 24 to the heater 19 where it is heated to approximately 180° Fahrenheit. The water is fed from the heater by piping 25 through a flow control switch 26, a chemical injection pump 27, through hose 28 to the cleaning head D carried on the motorized vehicle C.

The chemical injection pump 27 is provided for injecting any suitable conventional chemical into the stream of pressurized water flowing through the hose 28. A supply of chemical, if in the form of powder, is mixed with water in tank 29a by a motorized blender 30a. Electric power for operating the blender 30a, the pressure boosting pump 23, the injection pump 27, the exhaust pump G, and the flow control switch 26 is provided by the power generator 16.

The motorized vehicle C may be any suitable conventional utility vehicle, such as generally used for mowing large areas, or it may be a conventional general purpose tractor that has a hitch connection suitable for pulling the cleaning head D. The cleaning head D is carried by a frame member which includes a pair of spaced supporting frame members 29 and 30, respectively, which are joined by a cross-member 31 that, in turn, has welded thereto a tongue 32. An axle 33 is journaled on the frame members 29 and 30 and has wheels 34 carried thereon for transporting the cleaning head. The inner end of the supporting members 29 and 30 is welded to a back plate 35 of the suction nozzle. Upwardly extending braces 36a are also provided between the members 29 and 30 and the back plate 35 of the suction nozzle. Spaced from the back plate 35 so as to define a nozzle 36 is a front plate 37. The back and front plates 35 and 37 are triangular in shape and extend upwardly from adjacent the elongated slotted nozzle provided therebetween adjacent the bottom. The plates 35 and 37 are joined by side walls 38 to provide a closure. Welded adjacent the top of the back plate 35 is a pipe 39 to which a flexible 6 inch vacuum hose 40 is connected. The other end of the flexible vacuum hose 40 is coupled to a lower end of a swivel support F.

The sprayer means E includes an elongated tubular member 41 which has spray nozzles 42 spaced therein. Cleaning medium is supplied to the elongated tubular member 41 and the nozzles 42 by piping 43 which communicates with the tubular member. The other end of the piping 43 is connected to a valve 44 which can be selectively opened and closed to supply the cleaning medium to the nozzles 42. The valve 44 has a control plunger 45 which is activated by an elongated arm 46 which has its lower end attached by means of a spring 47 to a cable 48 which is, in turn, connected to a lever 49. By manipulating the lever 49 the control valve 44 can be selectively opened and closed. As can be seen in FIGS. 4, 5 and 6, the plurality of nozzles 42 are carried within an enclosure 50 which has an elongated opening 51 adjacent the bottom thereof for allowing the sprayed cleaning medium to be sprayed directly ahead of the suction nozzle 36. It is desired to enclose the sprayed cleaning medium within the housing 50 until such is closely adjacent the artificial turf being cleaned so as to minimize the temperature drop between the spray nozzles 42 and the artificial turf. Generally, the hotter the cleaning solution the better the cleaning action. Normally, the cleaning medium is heated to approximately 180° by the hot water heater 19 carried on the support vehicle 10.

The means for selectively raising and lower the cleaning head D from a cleaning position to a transporting position includes a swivel joint 52 which is pivotally connected by means of a bolt 53 to the tongue 32 of the frame upon which the cleaning head D is supported. A transverse pin 54 is provided between bifurcated ends

of the swivel 52 for coupling the tongue 32 to an elongated bar-type member 55 carried on the motorized vehicle. A pin 56, which is supported on the frame of the motorized vehicle 10, extends through the bar-type member 55 for allowing such to be pivoted from the full line position shown in FIG. 4 to the phantom line position. A conventional linkage mechanism including control handle 57, linkage members 58, dog leg 59, rod 60, arms 61, 62 and 62a are provided for raising and lowering the elongated member 55 responsive to moving the handle 57 from the full line position to the phantom line position. Such raises and lowers the tongue 32 so as to permit the lower end of the cleaning head to either rest on the artificial turf being cleaned or be raised off of the artificial turf to a transporting position. It is noted that the frame members 29 and 30 pivot about the axle 33 when the cleaning head is raised and lowered. It is desirable that the cleaning head during the cleaning operation bear down heavily on the artificial turf. An elongated iron weight 63 is carried on the front plate 37 of the cleaning head for increasing the weight imparted to the artificial turf by the cleaning head.

In order to permit the motorized vehicle to traverse the field being cleaned without interfering with the vacuum hose 15 or the water hose 28, the swivel support F is provided. The upper end of the swivel support F includes an elbow 64 which is journaled in a lower elbow 65 to which the vacuum hose 40 is coupled. Extending out of the upper elbow 64 is a metallic tubular member 66 to which the vacuum hose 15 is coupled. Normally, in operation the water hose 28 is attached to the tubular metallic hose 66 so that the vacuum hose and the water hose pass over the cleaning head as the motorized vehicle is turned around.

The flow switch 26 coupled to the output of the heater 19 cuts the pressure boosting pump 23 and the injection pump 27 off responsive to closing the valve 44.

Normally, the turf cleaner is utilized in cleaning fields. However, it is understood that it can also be used for removing water from playing fields.

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.

What is claimed is:

1. A portable device for cleaning an artificial turf athletic field and removing a liquid therefrom, having a tank positionable at a marginal portion of said field comprising: a vacuum hose having one end coupled to and communicating with said tank, a vacuum pump communicating with an upper portion of said tank for rapidly evacuating air from said tank causing a large volume of air to be drawn through said hose, a motorized utility vehicle carrying the other end of said vacuum hose for traversing said athletic field, an elongated transverse cleaning head carried by said motorized vehicle, a suction nozzle carried by said cleaning head and communicating with the other end of said vacuum hose, a swivel support carried by said motorized vehicle carrying said vacuum hose permitting the vehicle to turn for changing direction under the hose for traversing said athletic field, and means communicating with a base portion of said tank for conveying away the liquid and any foreign matter removed from the turf.

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2. The structure set forth in claim 1 including, a cleaning medium source, a sprayer means carried adjacent said cleaning head and connected to said source for spraying said cleaning medium on said turf ahead of said suction nozzle as the head is passed across the turf.

3. A portable device for cleaning an artificial turf athletic field with a liquid cleaning medium applied thereto comprising: a support vehicle, a tank carried by said support vehicle, a vacuum hose having one end coupled to and communicating with said tank, a vacuum pump communicating with said tank for rapidly evacuating air from said tank causing a large volume of air to be drawn through said hose, a motorized utility vehicle carrying the other end of said vacuum hose for traversing said athletic field, an elongated transverse cleaning head carried by said cleaning head and communicating with the other end of said vacuum hose cir-

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culating air in large volume through the nozzle and the tank, a swivel support carried by said motorized vehicle carrying said vacuum hose permitting the vehicle to turn for changing direction with a minimum of interference from the hose for traversing said athletic field, a pressurized source of hot water, a source of cleaning agent, means for mixing said cleaning agent with said hot water producing a pressurized cleaning medium, means for conveying said cleaning medium to a sprayer means carried adjacent said cleaning head for spraying said cleaning medium on said turf ahead of said suction nozzle as said head is passed across the turf, and means communicating with a base portion of said tank for conveying away the used cleaning medium and foreign matter removed from the turf.

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