

Figure 2

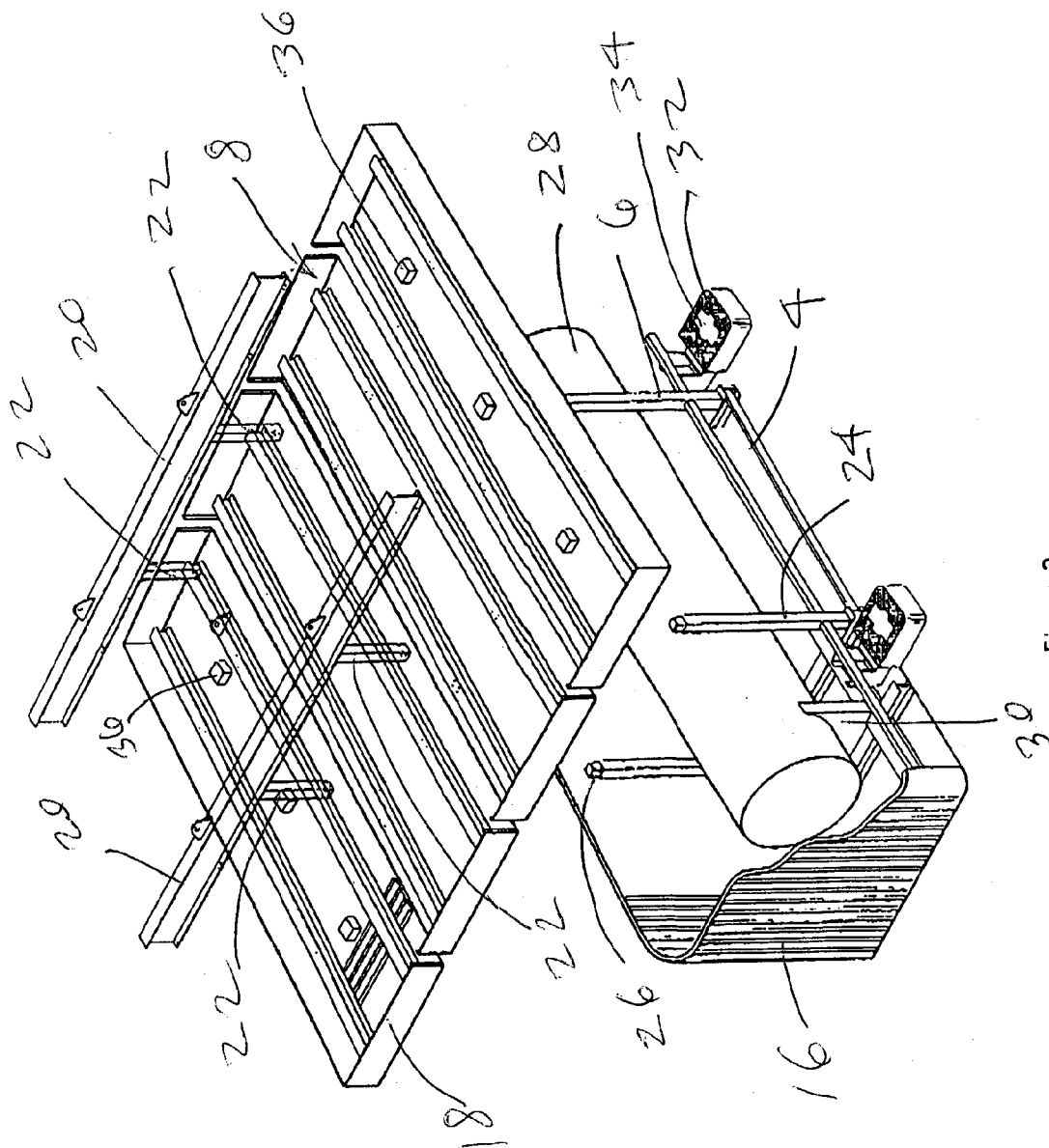


Figure 3

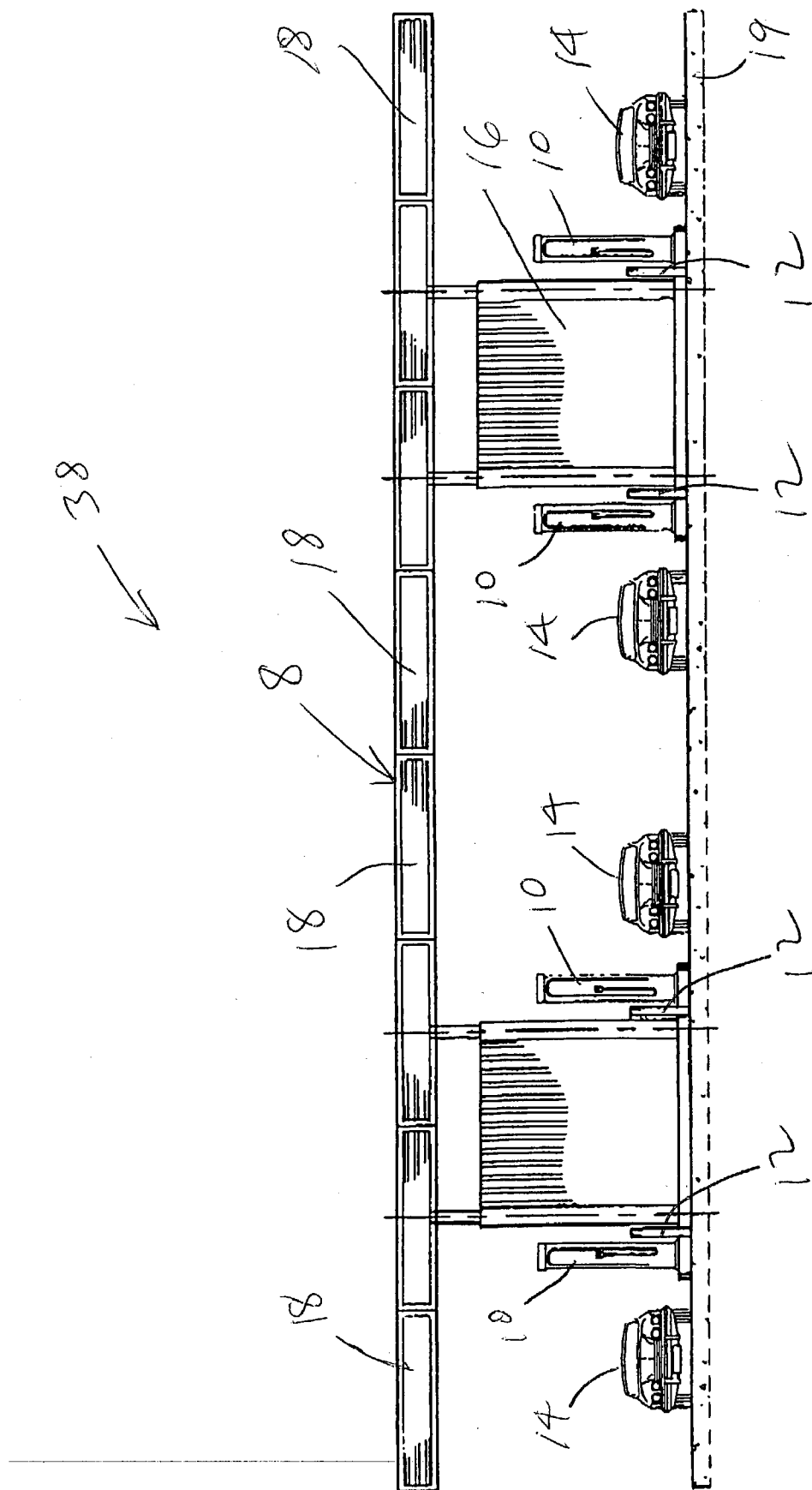


Figure 4

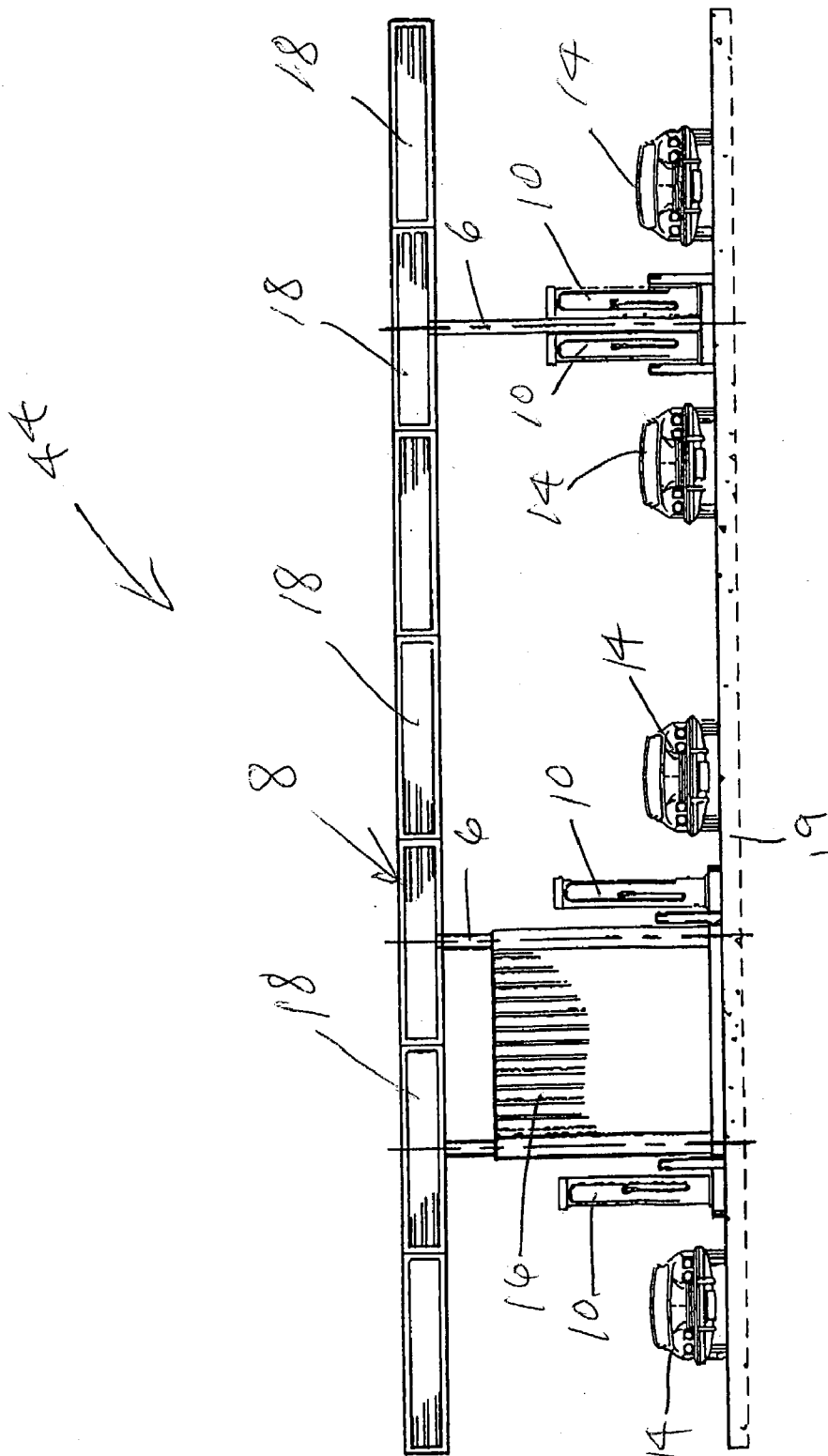


Figure 6

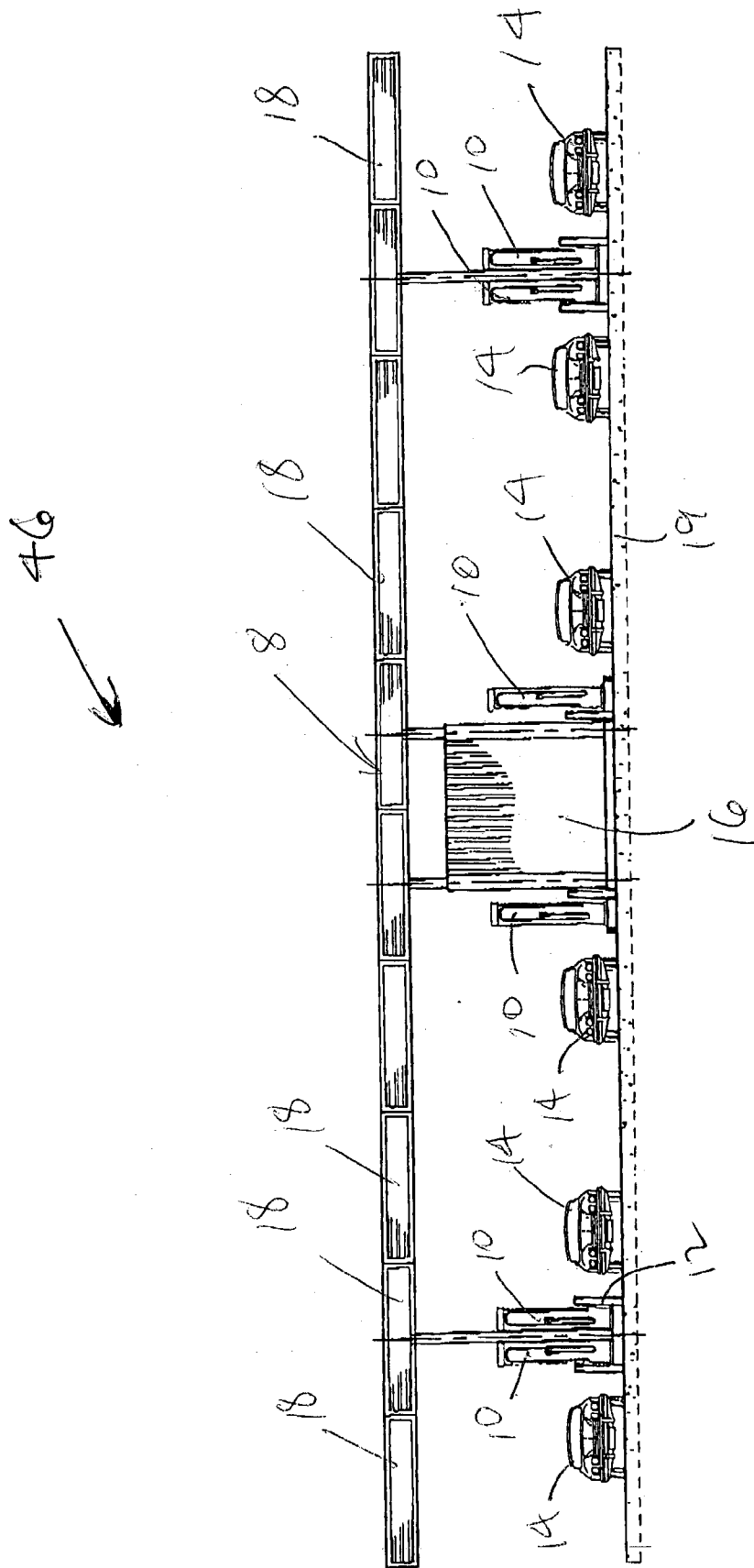


Figure 7

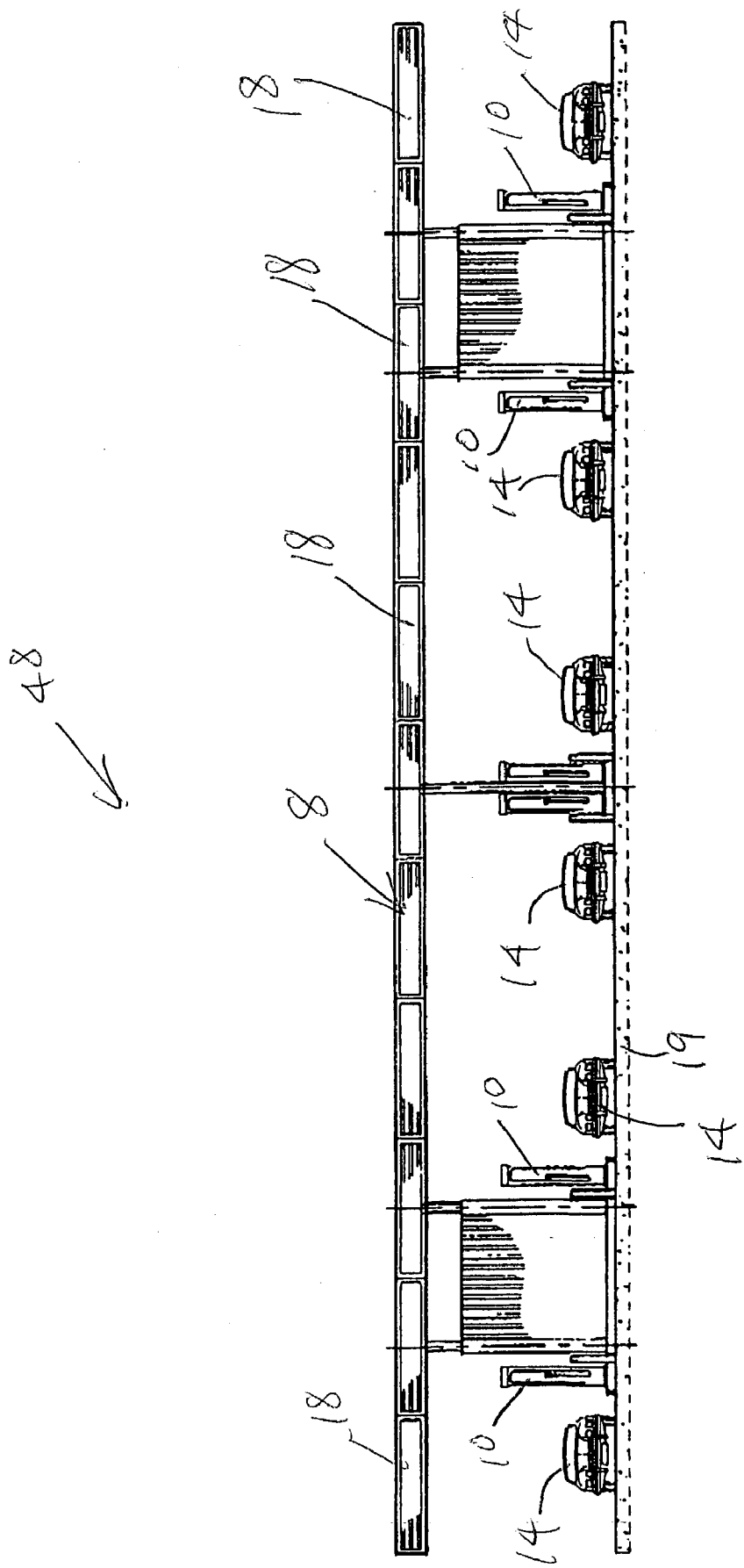


Figure 8

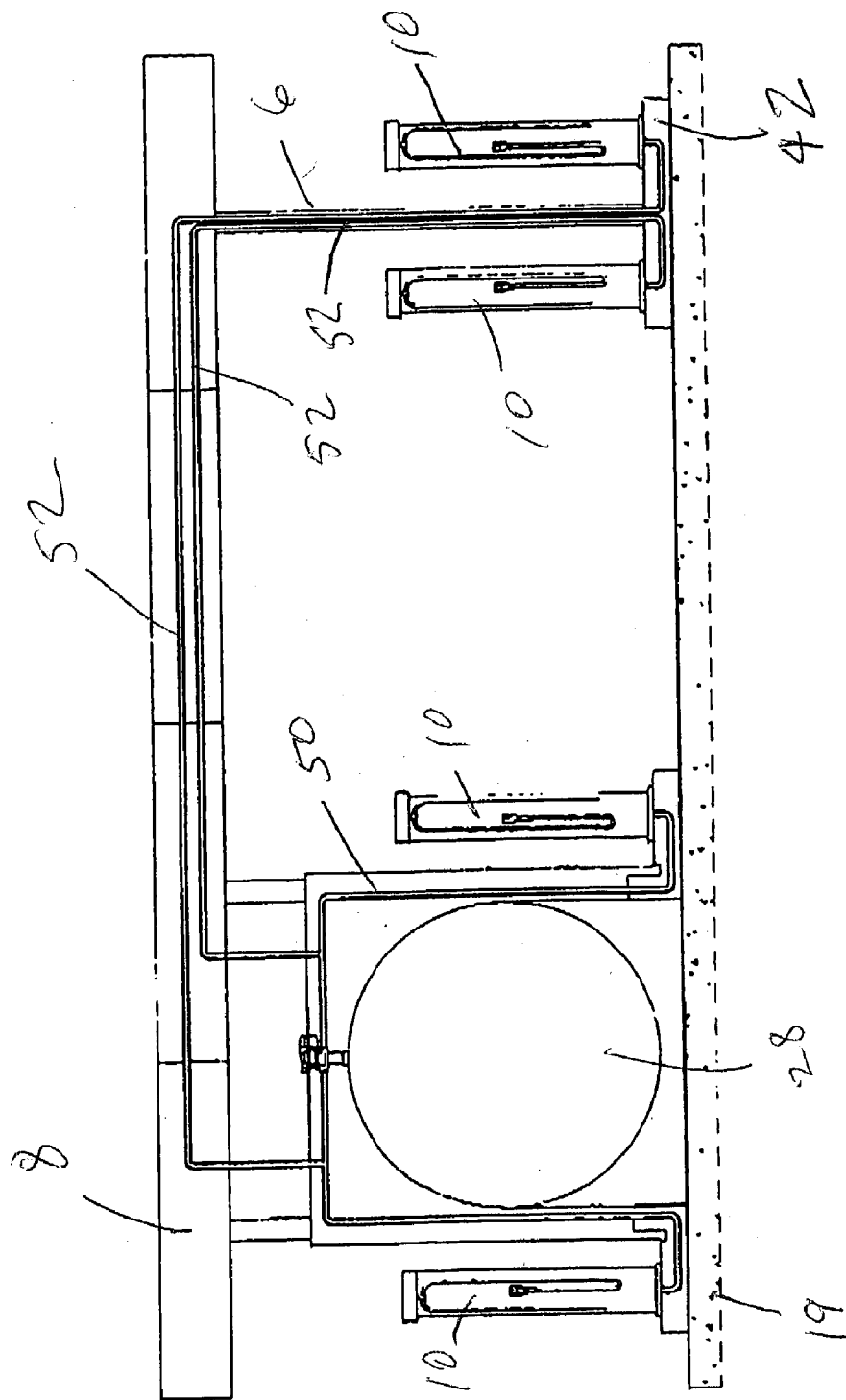


Figure 9

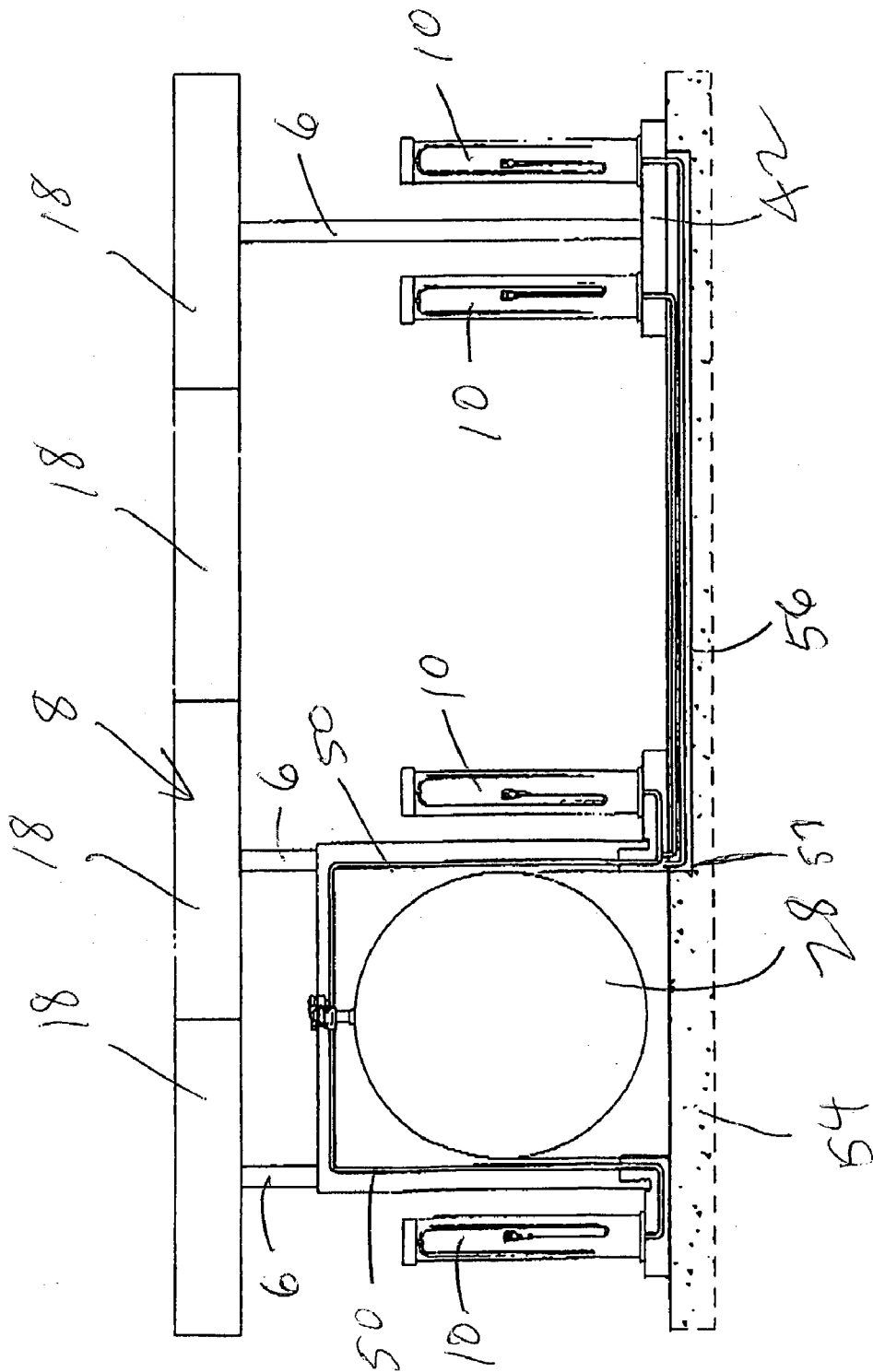


Figure 9a

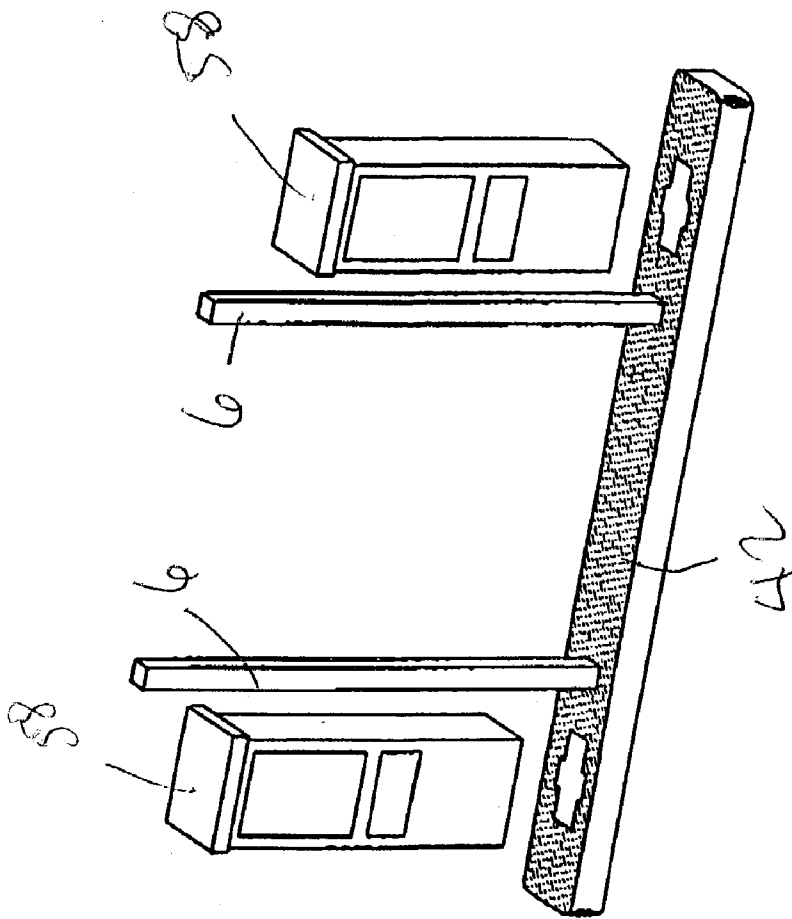


Figure 10

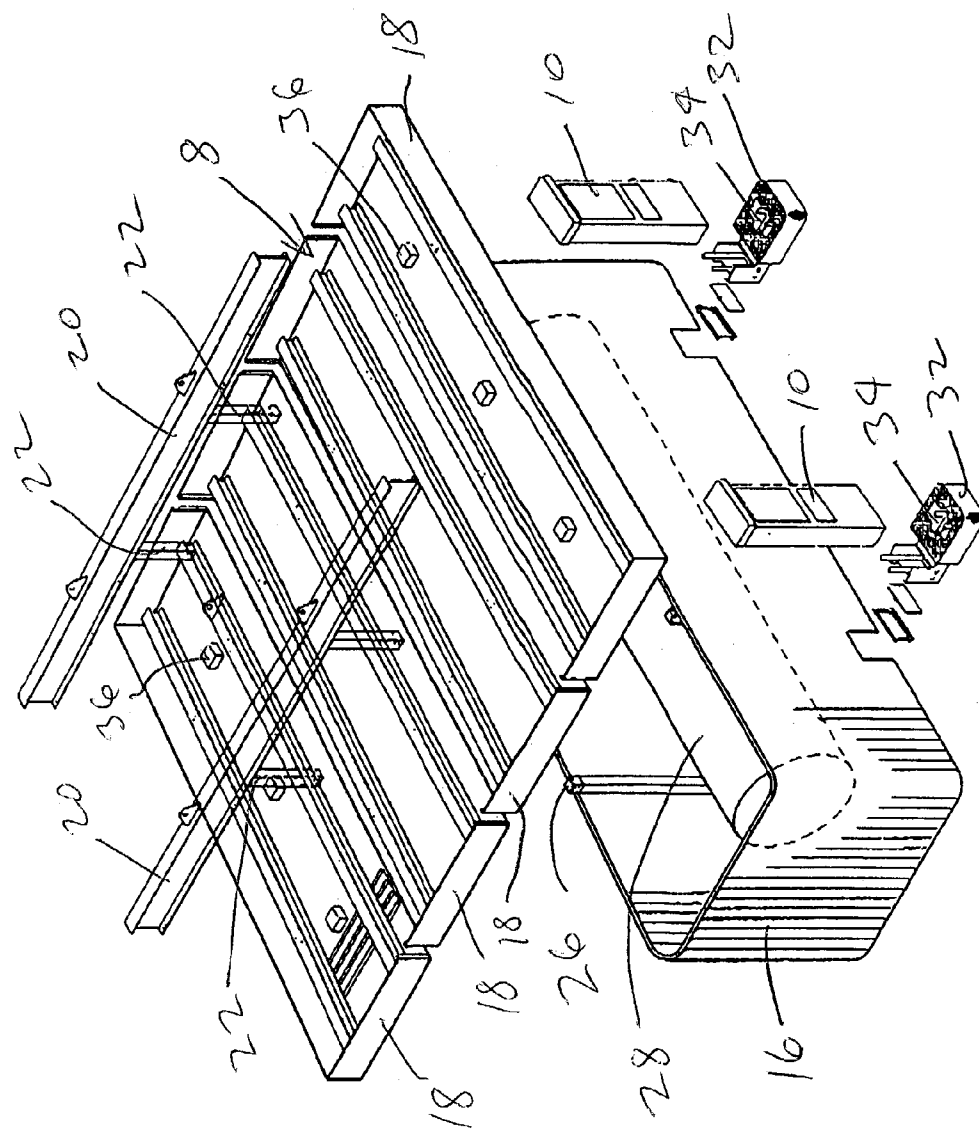


Figure 1]

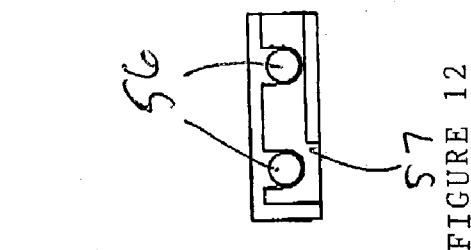


FIGURE 12

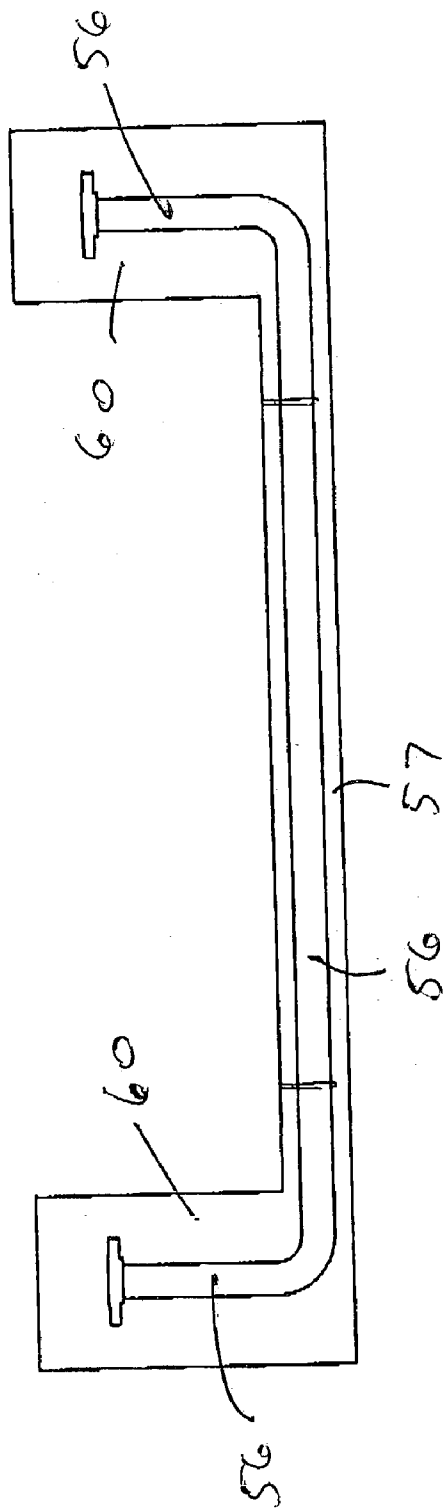


FIGURE 13

MODULAR ABOVE GROUND FUELING STATION AND METHOD OF CONSTRUCTION THEREOF

BACKGROUND OF THE INVENTION

[0001] 1. Field of invention

[0002] This invention relates to a gasoline station that rests on the top of the ground and, more particularly, to a gasoline station having a base with supports extending upwardly therefrom to support a full canopy that extends substantially beyond said base on both sides. This invention further relates to a method of installing a gasoline station that is pre-constructed in modular form and to a method of carrying on business using gasoline stations in accordance with the present invention.

[0003] 2. Description of the Prior Art

[0004] Most gas stations have underground gasoline storage tanks that are expensive to install and even more expensive to remove. In addition, underground storage tanks often leak and, despite the use of detection systems, gasoline from the underground storage tanks leaks into the ground. When a leak is detected in underground storage tanks, the tank must be removed and replaced at great expense. With gas stations that have aboveground storage tanks, a skirt can be located beneath the tanks to retain any gasoline that leaks from the tanks. Also, leaks from aboveground storage tanks are detected much more quickly and much more easily than leaks from underground storage tanks. Further, the tank can be repaired or replaced with little expense compared to the replacement of underground storage tanks. Underground storage tanks are usually located beneath a layer of asphalt or concrete which must be broken up and disposed of in order to remove the tank. When a new tank is installed underground, the asphalt or concrete is replaced with new material.

[0005] Portable gas stations are known but they have a very small canopy because of the danger that the gas station might become unstable in high winds. The small canopy is not suitable for self serve gas stations as consumers are not protected from rain when filling their vehicles. In addition, many previous portable gas stations have a base that is anchored into the ground.

SUMMARY OF THE INVENTION

[0006] It is an object of the present invention to provide a gasoline station that has a base that supports a gasoline storage tank and a full canopy without the necessity of anchoring the base into the ground. It is a further object of the present invention to provide a method of installing a modular above ground gasoline station and to a method of carrying on business using an above ground gasoline station.

[0007] An above ground gasoline station has a base with a gasoline storage tank mounted thereon and vertical supports around the tank. The base rests on a supporting surface and the supports extend between the base and a canopy. At least one gasoline pump is located outside of the supports. The canopy extends laterally substantially beyond the supports and beyond the at least one gasoline pump. The at least one gasoline pump is connected to the gasoline storage tank by gasoline supply lines located above ground and the station is connected to an electrical source.

[0008] A method of installing an above ground gasoline station where the station has a base with a periphery surrounding the base. The base has first partial supports for a canopy extending upward therefrom. The canopy is in multiple sections and a gasoline storage tank is located on the base. The method comprises installing the base on the supporting surface, assembling the sections of the canopy together, the canopy having second partial supports extending downward therefrom, the second partial supports corresponding to the first partial supports, lifting the canopy into position above the base and connecting each of the first supports to each of the corresponding second supports, installing at least one gasoline pump adjacent to the tank outside of the supports, the pump being connected to the tank above ground, and connecting the gasoline station to an electrical source.

[0009] A method of carrying on a gas station business using a gasoline station that is comprised of modular components, the method comprising choosing a site for a gasoline station, having a configuration for the gasoline station pre-constructed in modular form, delivering the modules to the site, assembling the modules on site, connecting the gasoline station to an electrical source and dispensing gasoline from the gasoline station.

[0010] Preferably, the base rests on a supporting surface without the necessity of anchoring means. Preferably, the gasoline storage tank is a double wall tank with monolithic insulation located between the two walls.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a schematic end view of an above ground gasoline station;

[0012] FIG. 2 is a schematic side view of the gasoline station shown in FIG. 1;

[0013] FIG. 3 is a partial exploded perspective view of a gasoline station;

[0014] FIG. 4 is a schematic end view of a further configuration of a gasoline station;

[0015] FIG. 5 is a schematic end view of an above ground gasoline station having a remote pump island;

[0016] FIG. 6 is a schematic end view of a further configuration of a gasoline station;

[0017] FIG. 7 is a schematic end view of a gasoline station having two remote islands;

[0018] FIG. 8 is a schematic end view of an above ground gasoline station having a remote island and two storage tanks;

[0019] FIG. 9 is a partial schematic end view of a gasoline station showing gasoline supply lines extending through a canopy;

[0020] FIG. 9a is a schematic end view of a gasoline station showing gasoline supply lines extending in an apron;

[0021] FIG. 10 is a perspective view of a further embodiment of a remote pump island;

[0022] FIG. 11 is an exploded view of one embodiment of a gasoline station;

[0023] FIG. 12 is an end view of a containment trough for gasoline supply lines; and

[0024] FIG. 13 is a schematic side view of the containment trough with end pieces mounted thereon.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0025] In FIG. 1, a portable gas station 2 has a base 4 with supports 6 extending upward therefrom to support a full canopy 8. Inside the supports 6, there is located a gasoline storage tank (not shown in FIG. 1). On either side of the base 4, there are located four gasoline pumps or dispensers 10 (only two of which are shown). A plurality of posts 12 are located outside of the supports 6 and base 4 to protect the storage tank and dispensers 10 in the event that a motor vehicle is involved in a collision with the portable gas station 2. A motor vehicle 14 is located on either side of the base. It can be seen that the canopy extends substantially beyond the base and substantially beyond the outer side of the motor vehicles to enable a user to pump gasoline into the motor vehicle while still being beneath the canopy. A panel 16 extends between the supports 6. The canopy 8 has four sections 18 that are mounted side by side adjacent to one another.

[0026] Preferably, the canopy extends laterally at least 12 feet on either side of the base. Preferably, the supports 6 have a series of panels 16 mounted around them and around the storage tank (not shown in FIG. 1) to conceal the storage tank from a user of the station. Only one panel 16 is shown in FIG. 1. Preferably, a concrete apron 19 is poured around the base 4 to provide support for the vehicles 14 using the gasoline station.

[0027] In FIG. 2, there is shown a side view of the gasoline station 2 of FIG. 1. The same reference numerals are used in FIG. 2 to describe those components of FIG. 1 that are identical to the components of FIG. 2 without further description unless otherwise indicated. Panels 16 surrounding the storage tank have an access door (not shown) to allow access to the storage area enclosed by the panels.

[0028] In FIG. 3, there is shown a partial exploded perspective view of the gasoline station 2 shown in FIGS. 1 and 2. The same reference numerals are used in FIG. 3 to describe those components that are identical to the components of FIG. 1. It can be seen that a cover of the canopy 8 has been removed to expose steel beams 20 that extend laterally across the canopy 8. An upper portion 22 of each support 6 is connected to the beams 20. There are 2 upper portions 22 connected to each beam 20. A lower portion 24 of each support 6 extends upwardly from the base 4. The lower portions each have a top 26 that is reduced in size to receive a corresponding upper portion 22. A gasoline storage tank 28 has a cradle 30 (only one of which is shown) at each end. The storage tank at 28 is set on the base 4 inside the supports 6 and panels 16. There is a pump island 32 having a spill containment box 34 or dispenser pan connected to the base 4 for each of the gasoline pumps (none of which are shown in FIG. 3).

[0029] During construction, the base 4, lower portions 24 of the supports 6 and the storage tank 28 are delivered as one modular component to the site where the gasoline station is

proposed to be constructed. After the base 4 has been properly positioned, the steel beams 20 and the upper portions 22 of the supports 6 are assembled on site with the sections 18 of canopy 8. The canopy 8 is then lifted into position by a crane (not shown) and the upper portions 22 are connected to the corresponding lower portions 24 of the supports 6. It can be seen that each of the outer sections 18 has three light fixtures 36 installed therein. The light fixtures are pre-wired so that when the sections of the canopy are properly assembled, the wiring is automatically connected. The wiring is not shown, but the wires are preferably located in an electrical conduit. The panels 16 are then put in place to complete the assembly as shown in FIG. 3. Finally, the pumps (not shown in FIG. 3) are added to the pump island and a concrete apron (not shown in FIG. 3) is poured around the base generally beneath the footprint of the canopy.

[0030] In FIG. 4, there is shown a configuration of a gasoline station 38, which can be broken down as two gasoline stations 2 mounted side by side with the inner canopy sections 18 from each of the gasoline stations 2 being connected to one another. The same reference numerals are used in FIG. 4 to describe those components that are identical to the components of FIG. 1.

[0031] In FIG. 5, there is shown a further configuration for a gasoline station 40. The same reference numerals are used in FIG. 5 as those used in FIG. 1 for those components that are identical. It can be seen that the station 40 has a remote pump island 42 having 4 pumps 10 (only two of which are shown). While the gasoline station 2 shown in FIG. 1 has a canopy 8 with four sections 18, the gasoline station 40 shown in FIG. 5 has a canopy 8 with five sections 18. The station 40 also has two additional supports 6 extending upwards from the remote island 42 to support to canopy 8. Only one of the additional supports 6 is shown in FIG. 5.

[0032] In FIG. 6, there is shown a further embodiment of a gasoline station 44. The same reference numerals are used in FIG. 6 to describe those components that are identical to the components of FIGS. 1 and 5. It can be seen that the gasoline station 44 is a combination of the gasoline station 2 shown in FIG. 1 and the remote island portion of the gasoline station 40 shown in FIG. 5.

[0033] In FIG. 7, there is shown a further embodiment of a gasoline station 46. The same reference numerals are used in FIG. 7 as those used in FIG. 6 for those components that are identical. The gasoline station 46 has the configuration shown in FIG. 6 with an additional remote island added on the side opposite to the pump island 42 shown in FIG. 6.

[0034] In FIG. 8, there is shown a further embodiment of a gasoline station 48. The same reference numerals are used in FIG. 8 as those used in FIGS. 1 and 6 for those components that are identical. It can be seen that the gasoline station 48 is a combination of the gasoline station 2 shown in FIG. 1 and the gasoline station 44 shown in FIG. 6 mounted side by side to one another. The canopy sections 18 shown in FIG. 8 would all be connected to those sections immediately adjacent to one another.

[0035] In FIG. 9, there is shown a schematic end view of a gasoline station having a base 4 supporting the storage tank 28 and a remote island 42. The same reference numerals are used in FIG. 9 as those used in FIG. 6 to describe those

components that are identical to one another. FIG. 9 shows gasoline supply lines 50 extending from the storage tank 28 to each of the pumps 10 that are located immediately adjacent to the storage tank. In addition, gasoline supply lines 52 extend from the storage tank 28 upwards into the canopy 8, across the canopy 8 and down through the supports 6 on the remote pump island 42 to the pumps 10 on the remote island 42. Sections 18 of the canopy 8 have been omitted from FIG. 9 as the additional canopy sections are not required for the purposes of that Figure. Additional sections would be required to shield a consumer from rain on the outside pumps shown in FIG. 9.

[0036] In FIG. 9a, there is shown a schematic end view of a gasoline station having the same configuration as that shown in FIG. 9 with one gasoline tank 28 and one remote island 42 having pumps 10. In the embodiment shown in FIG. 9a, the gasoline supply lines for the remote island are not located in the canopy 8. In FIG. 9a, an apron 54 is thicker than the apron 19 shown in the previous Figures. Supply lines 56 extend from the storage tank 28 through the apron 54 to the remote island 42. The supply lines 56 within the apron 54 are located within a steel containment through 57 which is embedded in the apron 54. The same reference numerals are used in FIG. 9a as those used in FIG. 9 to describe those components that are identical.

[0037] In FIG. 10, there is shown a perspective view of a further variation in a remote island 42. The remote island 42 shown in the previous drawings had four gasoline pumps, two at each end of the island. The remote island 42 shown in FIG. 10 has only two gasoline pumps 58. The gasoline pumps 58 have access hoses on each side together with calibration equipment (not shown) so that each pump 58 can serve customers on two sides of the island 42 simultaneously. There are two supports 6 that extend upward from the remote island 42.

[0038] In FIG. 11, there is shown an exploded perspective view of the various components that are constructed to form gasoline station 2 shown in FIG. 1. The gasoline storage tank 28, lower portions 24 of the supports 6 and panels 16 around the supports form a first component. The steel beams 20 and upper portions 22 of the supports 6 form second and third components respectively. Each section 18 of the canopy forms fourth to seventh components. The pump island 32, dispenser pan 34 and pumps 10 form a ninth component. In gasoline stations where there is a remote island 42, the remote 42 would be another component as would the dispenser pans and pumps for the remote island. When there is a remote island in a gasoline station, the remote island would be placed in position after the base has been placed. Usually, the canopy is assembled on the ground and connected to the steel beams and upper portions of the supports. The supports 6 on the remote island 42 would preferably be lower portions 24 with upper portions 22 being connected to the steel beams (not shown) in the canopy above the remote pump island 42. The entire canopy structure (including the steel beams and upper portions of the supports) is then lifted into place by a crane and the upper and lower portions of the supports are connected to one another. When the canopy is very large, it is assembled in two or more separate pieces. The separate pieces are then placed in position by a crane (not shown) and the supports are connected. The separate pieces are subsequently con-

nected together. For example, the canopy shown in FIG. 4 would likely be assembled and erected in two separate pieces.

[0039] In FIG. 12, there is shown an end view of a steel containment trough 57 containing gasoline supply lines 56. During installation, the steel containment trough 57 is placed in the concrete apron and the supply lines 56 are installed. The containment trough is then either embedded in the concrete or covered with a metal cover (not shown). The metal cover would allow full access to the supply lines at any time. In either case, the containment trough 57 is monitored by an electronic leak sensor (not shown). The tank and other piping is also monitored by electronic leak sensors.

[0040] In FIG. 13, there is shown a side view of the steel containment trough 57 that is connected to end pieces 60. The end pieces 60 contain part of the supply line 56 and one end can be connected to the pumps of the remote island. Neither the tank nor the remote island or pumps are shown in FIG. 13.

[0041] As can be seen from the foregoing description, there are numerous configurations of gasoline stations that can be constructed in accordance with the present invention. All of the gasoline stations have all of the gasoline components above ground. If any leaks occur, they will be noticed immediately and repairs can be made to repair the leak while the amount of gasoline spilled is relatively small. With previous gasoline stations having underground storage tanks as well as underground supply lines, leaks would sometimes occur and go unnoticed for a long period of time. Over a period of years, several leaks might have occurred. The ground upon which the gasoline station was located would become contaminated. The cost of cleaning up the premises would be substantial. Sometimes, premises would be purchased by an owner who did not cause any of the contamination on the premises, but that new owner could still be liable for the cleanup costs. The ground water is often contaminated.

[0042] The modules, and preferably the storage area created around the storage tank can include a control system for the gasoline station. The control system is preferably a gasoline control system and an electrical control system including an inventory controller, a pump controller and a leak detection system as well as an electrical breaker switch panel. Other controllers and systems could be added as well. For example, the leak detection system could sound an alarm or contact an emergency telephone number to report the leak or both. The gasoline system can be installed in those jurisdictions where an attendant is not required by law, to operate automatically on a self serve basis. For example, customers could access the system using a credit card, debit card or other means of identification and automatic payment and provide their own gasoline on a self serve basis, thereby saving the cost of having an attendant on site at all times. When the gasoline in the gasoline storage tank reaches a certain minimum level, the system could automatically order more gasoline to be delivered. Preferably, the gasoline storage tank is divided into two or more compartments to allow different grade levels of gasoline or different types of fuel to be dispensed from the gasoline station.

[0043] Preferably, the canopy extends laterally at least 12 feet on either side of the base. Preferably, the base is

comprised of steel beams arranged together to form a frame for the base. The gasoline tank is preferably a double wall steel tank. In the space between the two walls, there is a layer of monolithic insulation. The monolithic insulation makes the tank extremely heavy and very secure. The weight of the tank even when empty, is more than sufficient to keep the station on the ground in windy conditions. Preferably, the storage tank is divided into two compartments or three or more compartments so that different types of fuel can be pumped from the same tank. Preferably, the station is supplied with electricity from an outside source to operate the lights in the station. Preferably, there is a kiosk (not shown) located on the base 4 at one end to house an operator of the station as well as a cash register, replacement oil and/or snack foods. In an alternative design, the kiosk could be located adjacent to the station. In a further alternative, another type of accessory building other than a kiosk could be used. In some uses, no accessory building may be required. Where electricity is not readily available, the station could have its own gasoline powered generator to generate electricity to meet the needs of the station. There is an access door (not shown) located in the paneling. The gasoline storage tank can be a 65,000 liter FIREGUARD (a trademark) tank. Preferably, the canopy measures at least 36 feet by 38 feet and the canopy extends laterally at least 15 feet beyond the base on each side. The canopy must be strong enough to support the snow load in the area in addition to the pressures caused by the wind conditions.

[0044] While the pumping station has been described to pump gasoline, diesel fuel or other liquids could be pumped as well as, or in lieu of, gasoline. In areas of the world where water is extremely scarce, the system could be used to supply potable water to customers.

[0045] While a single unit of the gasoline pumping station is shown in the drawings, a station could be designed to consist of two or three or even more units mounted adjacent to one another. While the capacity of the gasoline storage tank is less than the capacity of underground storage tanks, the gasoline station is designed to be used in locations where the sales of gasoline are much less than the sales of a conventional station with underground storage tanks. The portable station has an advantage in that it can be moved to another location if sales are not as high as expected or sales drop off with time. Since the gasoline pumping station of the present invention can be supplied and installed at a much smaller cost than conventional stations with underground storage tanks, an owner of the portable station does not need to sell nearly as much gasoline in order to achieve a reasonable profit level. Signage and lighting is not shown in the drawings. In addition to the canopy, advertising or other signage could be located on the outside surface of the panels. Since the gasoline station is entirely above ground, any leaks are detected early and contamination of the ground water is extremely unlikely.

[0046] While the station of the present invention is suitable for self-serve use, it can, of course, also be used for full serve use. While the station can be anchored to the ground, such anchoring is not required.

I claim:

1. An above ground gasoline station comprising a base with a gasoline storage tank mounted thereon and vertical supports around said tank, said base resting on a supporting

surface, said supports extending between said base and a canopy, with at least one gasoline pump located outside of said supports, said canopy extending laterally substantially beyond said supports and said at least one gasoline pump, said at least one gasoline pump being connected to said gasoline storage tank by gasoline supply lines located above ground, said station being connected to an electrical source.

2. A gasoline station as claimed in claim 1 wherein said station comprises a plurality of modules that were constructed off site and assembled on site.

3. A gasoline station as claimed in claim 2 wherein there are leak monitoring sensors for gasoline leaks at said station.

4. A gasoline station as claimed in claim 2 wherein there is a remote pump island and said at least one pump is located on said remote pump island, said remote pump island being spaced apart from said gasoline storage tank by more than one vehicle width.

5. An above ground storage tank as claimed in claim 4 wherein said gasoline station is electrically connected to an accessory building.

6. A gasoline station as claimed in claim 5 wherein the accessory building is a kiosk.

7. A gasoline station as claimed in claim 4 wherein there are panels located around said tank to create a storage area around said tank.

8. A gasoline station as claimed in claim 3 wherein there is a control system mounted near said gasoline storage tank to monitor and control gasoline dispensing from said station.

9. A gasoline station as claimed in claim 8 wherein said control system includes an electrical controller.

10. A gasoline station wherein said accessory building is a kiosk.

11. A gasoline station as claimed in claim 2 wherein said modules are pre-wired for electrical purposes and contain pre-installed gasoline supply lines.

12. A gasoline station as claimed in claim 11 wherein said electrical wiring and said gasoline supply lines are automatically connected when said modules are properly assembled.

13. A gasoline station as claimed in claim 4 wherein there are two remote islands, one remote island on either side of said gasoline storage tank.

14. A gasoline station as claimed in any one of claims 4 or 13 wherein the gasoline supply lines to any remote island extend from said gasoline storage tank through said canopy.

15. A gasoline station as claimed in any of claims 4 or 13 wherein there are supports on every remote pump island to support said canopy.

16. A gasoline station as claimed in claim 3 wherein there are a plurality of pumps and some of the pumps are outermost pumps, said canopy extending substantially beyond said outermost pumps for more than one vehicle width.

17. A gasoline station as claimed in claim 3 wherein there is a concrete apron extending around said base and any remote pump island generally beneath said canopy.

18. A gasoline station as claimed in claim 17 wherein there is at least one remote pump island and said gasoline supply lines extend from said gasoline storage tank to a pump on said remote pump island through said apron.

19. A gasoline station as claimed in claim 18 wherein there is a containment trough installed in said apron between

said gasoline storage tank and said remote pump island and said gasoline supply lines are installed in said containment trough.

20. A gasoline station as claimed in claim 19 wherein there is a monitoring system to detect leaks in said containment trough.

21. A gasoline station as claimed in claim 19 wherein said containment trough is made of steel.

22. A gasoline station as claimed in claim 21 wherein said containment trough is embedded in said apron.

23. A gasoline station as claimed in claim 21 wherein said containment trough has a steel cover that is removable to allow access to gasoline supply lines within said containment trough.

24. A gasoline station as claimed in claim 7 wherein there is an access door in said panels to allow access to a storage area created by said panels around said gasoline storage tank.

25. A method of installing an above ground gasoline station, said station having a base with a periphery surrounding said base, said base having first partial supports for a canopy extending upward therefrom, said canopy being in multiple sections, a gasoline storage tank located on said base, said method comprising installing said base on said supporting surface, assembling said sections of said canopy together, said canopy having second partial supports extending downward therefrom, said second partial supports corresponding to said first partial supports, lifting said canopy into position above said base and connecting each of said first supports to each of said second supports, installing at

least one gasoline pump adjacent to said tank outside of said supports, said pump being connected to said tank above ground, and connecting said station to an electrical source.

26. A method of installing an above ground gasoline station wherein said gasoline storage tank is installed on a module including a base and panels surrounding said gasoline storage tank to create a storage area, said storage area including a control system for said gasoline station, said method comprising installing a remote island separate and apart from said base, said remote island including gasoline pumps.

27. A method of carrying on a gas station business using gasoline stations comprised of modular components, said method comprising choosing a site for a gasoline station, having a configuration for said gasoline station pre-constructed in modular form, having the modules delivered to said site, assembling the modules on said site, connecting the gasoline station to an electrical source and dispensing gasoline from said electrical station.

28. A method of carrying on business as claimed in claim 27 including the step of carrying on a gasoline station business on a retail basis.

29. A method of carrying on business as claimed in claim 27 including the steps of disassembling a previously installed gasoline station and removing said station from said site, subsequently reinstalling said station on another site.

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