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Fell(10) **Pub. No.: US 2007/0181212 A1**(43) **Pub. Date: Aug. 9, 2007**(54) **METHOD AND APPARATUS FOR
REFUELING MULTIPLE VEHICLES****Publication Classification**(75) Inventor: **Joe Fell**, Belvidere, IL (US)(51) **Int. Cl.****B65B 1/04** (2006.01)(52) **U.S. Cl.** **141/231**

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ABSTRACT

A refueling dock for refueling multiple vehicles at one time is disclosed. The dock has a manifold that has an inlet that can be connected to a fuel tanker truck and a plurality of outlet openings. Each outlet opening has a valve that controls the flow of fuel through the hose. A nozzle is fitted to the hose and is located at the end of the hose distant from the outlet opening. Two or more hoses can be simultaneously connected to different equipment in need of refueling. A valved fuel tank inlet line enables fuel to flow from the manifold to a fuel tank on the dock. When needed, fuel from the tank can then be pumped to the manifold through a fuel tank outlet line, which can be connected to the same inlet on the manifold that is used to receive fuel from the tanker truck.

(73) Assignee: **RYAN INCORPORATED CENTRAL**(21) Appl. No.: **11/700,628**(22) Filed: **Jan. 31, 2007****Related U.S. Application Data**

(60) Provisional application No. 60/743,209, filed on Feb. 1, 2006.

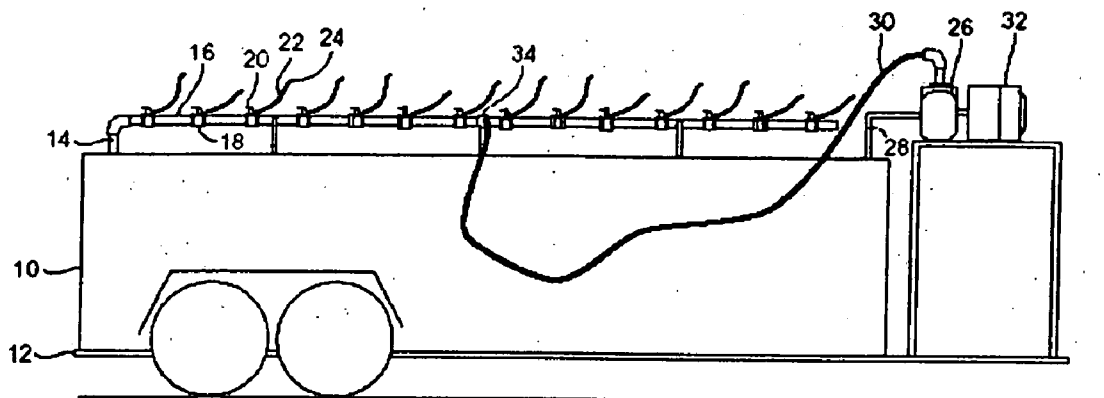
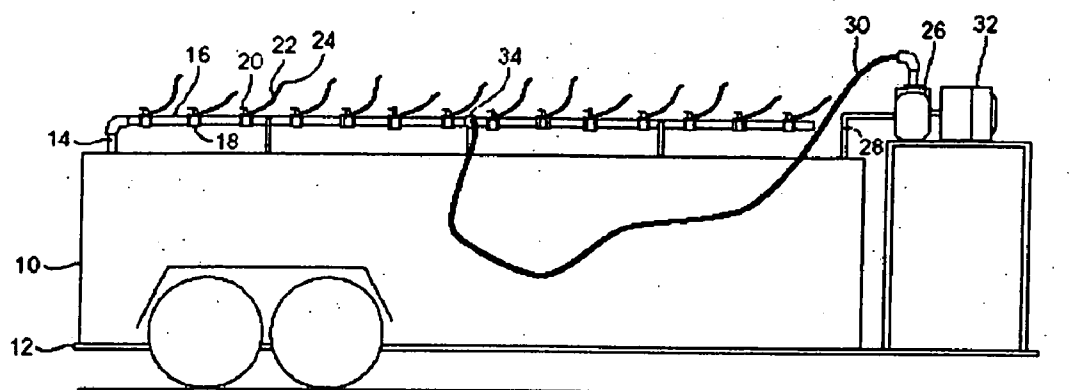


FIG. 1



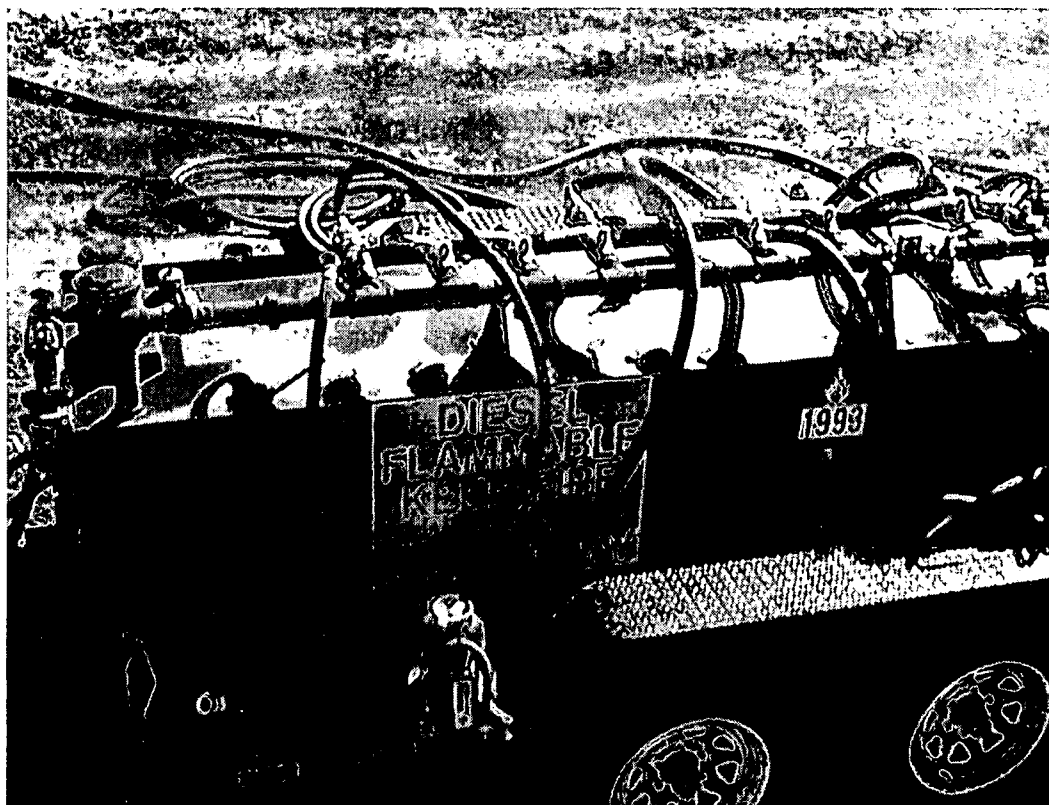


Fig. 2

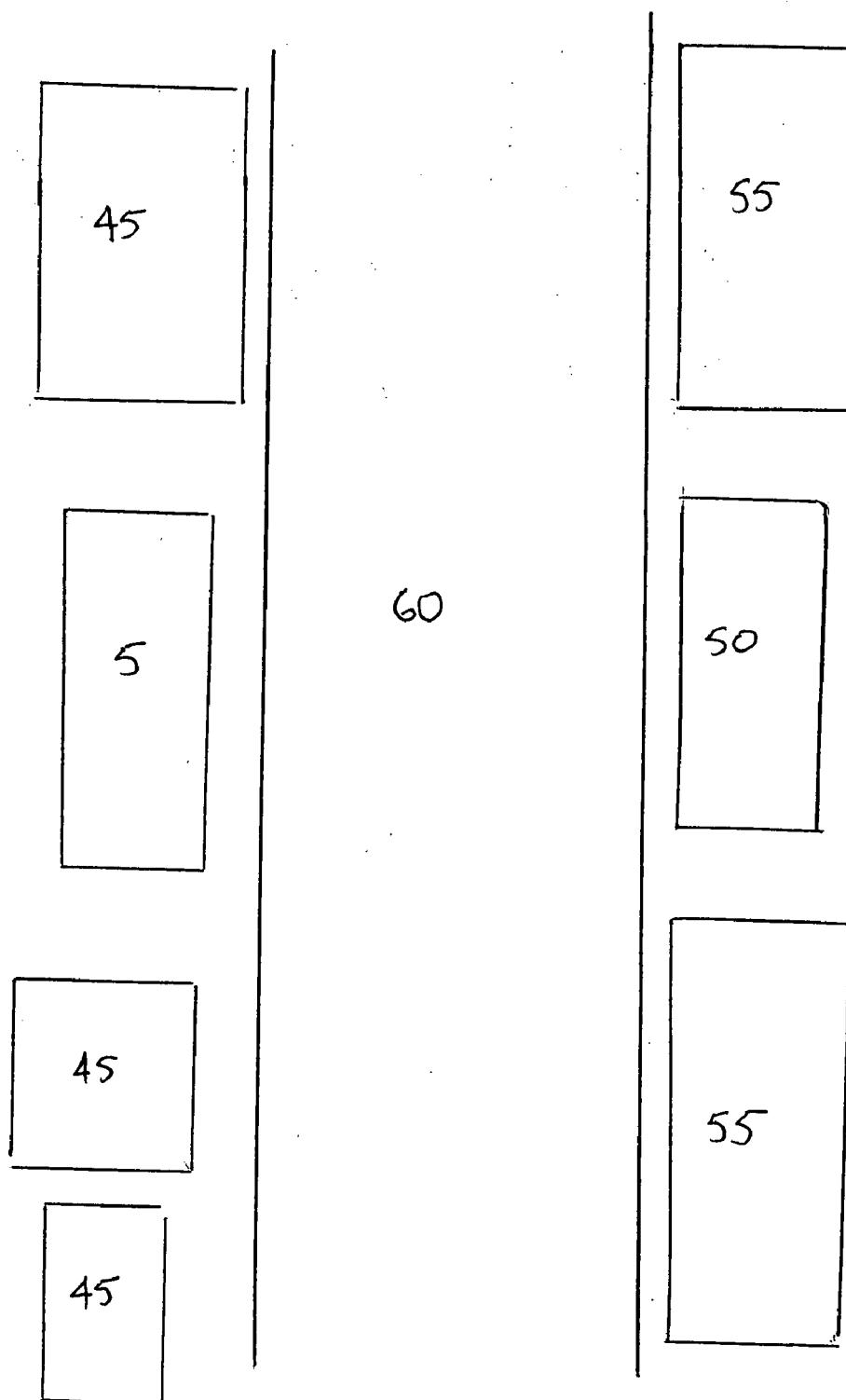


Fig. 3



Fig. 4

FIG 5



METHOD AND APPARATUS FOR REFUELING MULTIPLE VEHICLES

RELATED APPLICATION

[0001] This application claims priority to U.S. Provisional application No. 60/743,209, filed Feb. 1, 2006, which is incorporated by reference in its entirety.

FIELD OF THE INVENTION

[0002] This invention is directed to a method and apparatus for refueling vehicles used on a construction site and, in particular, to a method and apparatus for refueling multiple vehicles at one time using a refueling dock with multiple fuel hoses.

BACKGROUND OF THE INVENTION

[0003] While working on a construction site, large vehicles that are used in moving and hauling dirt and debris need to be refueled. To deal with this problem, construction companies generally hire fuel companies to bring a large fuel tanker truck to the construction site and connect the tanker truck individually to each piece of equipment that needs to be refueled. This is a time consuming, expensive process. The tanker truck travels to the location of each piece of equipment and refuels one piece of equipment at a time. The fuel company must travel to the work site each time refueling is needed, often one or more times per day.

SUMMARY OF THE DISCLOSURE

[0004] The new refueling dock reduces the time and expense needed to refuel multiple vehicles or pieces of equipment by providing fuel to multiple pieces of equipment at one time.

[0005] The disclosed refueling dock includes a tank that can be used to hold fuel. The tank is supported on a wheeled base such as a trailer or flat-bed. Preferably, the base will allow ease of movement and convenient placement of the dock. Fuel is provided through a manifold in the dock. Fuel may be supplied to the manifold by the fuel tanker truck or from the fuel tank. A pump enables the dock to be used independently of the tanker truck.

[0006] When refueling is necessary, the equipment is arranged around the refueling hoses are connected to the manifold, and each of the hoses is equipped with a nozzle to distribute fuel. The nozzle of a fuel hose is inserted into the gas tank of each piece of equipment and, consequently, fuel can be supplied to multiple pieces of equipment at one time.

[0007] Prior to the beginning of construction at a new site, workers create a staging area is a temporary location where vehicles, equipment, or material are stored when not in use. Generally, when a construction site has been identified, the workers use bulldozers or similar equipment to level and clear a particular area to serve as the staging area. The staging area as constructed often looks like a very wide road.

[0008] In many cases, the refueling dock should be located in this staging area. When refueling is required or when the equipment is not in use, it can be parked within range of the hoses on the refueling dock. Fuel may then be pumped through the manifold of the refueling e pieces of equipment at one time. In some cases, it may be desirable to arrange a along each side of the staging area, and align the equipment

in need of fuel in front of and behind each refueling dock. Doing so leaves room for the tanker truck to drive refueling docks and conveniently access each of them.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a side view of the refueling dock.

[0010] FIG. 2 is an enlarged perspective view of a manifold located on top of the fuel

[0011] FIG. 3 is an enlarged side view of the manifold.

[0012] FIG. 4 is another perspective view of the refueling dock.

[0013] FIG. 5 is a plan view of the refueling dock positioned in a staging area.

DETAILED DESCRIPTION

[0014] FIG. 1 illustrates one example of a refueling dock 5 that uses the present invention. In general, the refueling dock includes a fuel tank 10, wheeled base 12, a fuel tank outlet line 14, and a manifold 16. These components will be described in more detail below. The base may also have an enclosed housing for the tank.

[0015] The illustrated fuel tank 10 is supported by the wheeled base 12, and is connected to the manifold 16 through the fuel tank outlet line 14. The fuel tank may be fitted with bung holes that can be used to attach pipes. As explained below, the fuel tank outlet line can be used to convey fuel from the tank to the manifold.

[0016] The illustrated manifold 16 is located above and outside the fuel tank 10. It is constructed of metal pipe and contains a plurality of outlet openings 18. Each outlet opening may include a valve, which, in this illustration, is a ball valve 20. A plurality of refueling hoses 22 extend from the outlet openings to refueling nozzles 24. The illustrated nozzles are fast-fill nozzles that can greatly increase the efficiency and minimize the cost of the refueling process. Nozzles such as those sold by Shaw Development or Adel Wiggins, for example, may be used.

[0017] For distribution to vehicles, fuel may be provided to the manifold 16 from either a tanker truck or from the tank 10. To obtain fuel from the tanker truck, a fuel line from the tanker truck is connected to an inlet 34 on the manifold, which accepts a fuel nozzle from a tanker truck. The tanker truck contains its own pumping mechanism that can be used to pump fuel into the manifold.

[0018] As noted above, fuel tank outlet line 14 can also be used to supply the manifold 16 with fuel from the fuel tank 10 in the refueling dock. The dock has a pump 26 that enables a user to selectively draw fuel from the tank, enabling the dock to function independently of the tanker truck. The illustrated pump is in the fuel tank outlet line 14, and thus is in flow connection with the tank 10. Here, it is connected through a pipe 28 that is connected to a bung hole in the fuel tank, as shown in FIG. 3. The pump 26 may be driven by an engine 32, which is preferably powered by a battery.

[0019] To obtain fuel from the tank 10, the pump 26 in the dock is tuned on, causing fuel in the tank to flow through the fuel tank outlet line 14 from the tank 10 through the pipe 28 to the pump 26. The pump urges the fuel through a conduit

30 in the fuel tank outlet line that has an end that can be connected to an inlet to the manifold **16**. Preferably, the inlet that is used to receive the fuel tank outlet line **14** is the same inlet that is used to receive fuel from the tanker truck. Other arrangements are possible. For example, the fuel tank outlet line **14** could be permanently connected to the manifold, with a valve installed between the pump and the manifold.

[0020] From the manifold **16**, fuel may travel through any of the refueling hoses **22**. The outlet openings **18** on the manifold **16** may be arranged at a variety of angles to allow maximum space for attaching and using each of the hoses **22**. A valve is associated with each of the hoses **22**, and controls the flow of fuel through that associated hose. For example, a hose can be engaged by placing the associated ball valve **20** in the open position. As an alternative to or in addition to the illustrated ball valve **20**, an automatic shut-off valve can be included in the refueling nozzle **24**. Such a valve prevents fuel from exiting the hose when it is not actively in use refueling a vehicle.

[0021] As needed, the tank **10** can be resupplied with fuel from the tanker truck. The illustrated manifold **16** is attached to the tank through a valved fuel tank inlet line **35** that can be used to fill the tank. The illustrated fuel tank inlet line is completely separate from the fuel tank outlet line **14**, and is threaded to a bung hole on the tank. The illustrated tank inlet line **35** has a ball valve, as seen in the left-hand portion of FIG. 3. When the tank is to be filled, the valve in the tank inlet line **35** can be opened. When the valve is in open, fuel travels from the manifold through the fuel tank inlet line into the fuel tank, filling the tank for future use.

[0022] When construction equipment requires refueling, the tanker truck can be attached to the refueling dock **5** through the inlet **34** on the manifold **16**. The construction equipment can be arranged around the refueling dock. Where applicable and as needed, the hoses **22** can be unspooled from hose reels that can be used to store the hoses. The hose reels may be mounted either internally or externally on the base **12**, and may include electric or manual hose rewinders. If desired, the hoses can be extended to different stations, allowing the equipment to park at various locations around the refueling dock. Each station may contain a post, pole, or stand that will hold at least one nozzle to prevent the nozzle from sitting on the ground where dirt can contaminate the fuel.

[0023] The refueling dock of the invention is preferably located in the staging area throughout construction. In many cases, the equipment requiring refueling should be arranged around the refueling dock when refueling is necessary and when construction is not active. The equipment can often be arranged so that the fuel tank of the equipment is facing the refueling dock and close enough to the refueling dock so that the refueling hoses **22** are not in contact with the ground. To properly accommodate all equipment, more than one refueling dock may be placed in the staging area.

[0024] One preferred arrangement is seen in FIG. 4. In that arrangement, the fuel hoses of the dock can reach multiple vehicles requiring refueling without unduly interfering with movement of vehicles through the staging area. The refueling dock **5** is positioned on one side of the staging area, with equipment **45** positioned in line with the dock, both directly in front of the dock and behind it. The fuel tank for each piece of equipment faces the interior of the staging area. This

arrangement is similar to that of cars parked along both sides of a street. A second dock **50** and other equipment **55** in need of fuel are aligned along the opposite side of the staging area. There is sufficient space between the rows of equipment for a fuel company tanker truck to drive down a haul road **60** into the staging area and connect to either refueling dock.

[0025] While the present invention has been described with reference to specific embodiments, which are intended to be illustrative only and not limiting of the invention, it will be apparent to those of ordinary skill in the art that changes, additions, and/or deletions may be made to the disclosed embodiments without departing from the spirit and scope of the invention; which is set forth in the following claims.

1. A refueling dock that can be used to simultaneously refuel multiple pieces of equipment and has:

- a wheeled base;
- a manifold;
- a plurality of refueling hoses that each extend from the manifold to a refueling nozzle;
- a valve associated with each refueling hose;
- an inlet on the manifold that accepts a fuel nozzle from a tanker truck;
- a fuel tank;
- a pump that is fluidly connected to the tank and enables a user to selectively draw fuel from the tank;
- a fuel tank outlet line through which fuel from the tank flows on the way to the manifold when the pump is operated; and
- a valved fuel tank inlet line through which fuel from the manifold flows to the fuel tank when the valve is open.

2. A refueling dock as recited in claim 1, in which the fuel tank outlet line has an end that is directly connected to the inlet on the manifold when the pump is operated.

3. A refueling dock as recited in claim 1, in which the pump is mounted on the fuel tank outlet line.

4. A refueling dock as recited in claim 1, in which the fuel tank outlet line is completely separate from the valved fuel tank inlet line.

5. A refueling dock as recited in claim 1, in which the manifold is positioned above and outside the fuel tank.

6. A method of refueling multiple pieces of equipment on a construction site, the method comprising the steps of:

positioning a refueling dock as recited in claim 1 in a staging area; and

connecting at least some of the refueling nozzles to multiple pieces of equipment.

7. The method of claim 6, and further comprising the steps of:

connecting a fuel nozzle from a tanker truck to the inlet on the manifold;

assuring that the valve for the valved fuel tank inlet line is open; and

pumping fuel from the tanker truck through the manifold to the fuel tank.

8. The method of claim 6, and further comprising the steps of:

assuring that the fuel tank has fuel;

connecting an end of the fuel tank outlet line to the inlet on the manifold; and

running the pump.

9. The method of claim 6, and further comprising the steps of:

connecting a fuel nozzle from a tanker truck to the inlet on the manifold;

pumping fuel from the tanker truck through the manifold and to the pieces of equipment;

assuring that the valve for the valved fuel tank inlet line is open;

pumping fuel from the tanker truck through the manifold to the fuel tank;

removing the fuel nozzle from the tanker truck from the inlet;

connecting an end of the fuel tank outlet line to the inlet; and

running the pump.

10. The method of claim 6, further comprising the steps of:

aligning multiple pieces of equipment in need of fuel in front of and behind the refueling dock;

connecting one of the refueling hoses to each of the pieces of equipment;

connecting a fuel tanker truck to the refueling dock; and simultaneously pumping fuel through the refueling dock to the pieces of equipment.

11. A method for refueling multiple pieces of equipment at a worksite comprising

positioning a refueling dock with multiple refueling hoses in a staging area;

aligning multiple pieces of equipment in need of fuel in front of and behind the refueling dock;

connecting one of the refueling hoses to each of the pieces of equipment;

connecting a fuel tanker truck to the refueling dock; and simultaneously pumping fuel through the refueling dock to the, pieces of equipment.

12. The method of claim 11, wherein the refueling dock and the equipment in need of fuel are aligned along one side of the staging area.

13. The method of claim 1, wherein:

the refueling dock and some of the equipment in need of fuel are aligned along one side of the staging area;

a second refueling dock and other equipment in need of fuel are aligned along an opposite side of the staging area; and

a space is provided between the lines of equipment that is approximately equal to the width needed for a fuel tanker truck to drive between the lines.

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