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A station for washing objects, particularly vehicles

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A STATION FOR WASHING OBJECTS, PARTICULARLY VEHICLES

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The invention relates to a station for washing an object, and comprising a pit for receiving fluid that has been used to wash the object, wherein the pit contains rubble for filtering the fluid prior to the fluid exiting the pit through an outlet to separation means for removing contaminants from the fluid, and subsequent passage of the fluid from the station to a drainage system or recirculation of the fluid to wash a further object, in use.

ABSTRACT

The invention relates to a station for washing an object, and comprising a pit for receiving fluid that has been used to wash the object, wherein the pit contains rubble for filtering the fluid prior to the fluid exiting the pit through an outlet to separation means for removing contaminants from the fluid, and subsequent passage of the fluid from the station to a drainage system or recirculation of the fluid to wash a further object, in use.

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Patents Act 1990

ORIGINAL

COMPLETE SPECIFICATION

PETTY PATENT

Invention Title: A STATION FOR WASHING OBJECTS, PARTICULARLY VEHICLES

The following statement is a full description of this invention, including the best method of performing it known to me:

GH REF: P24768-B:MHK:IHA

FIELD OF THE INVENTION

The present invention relates to a station for washing objects such as machines, vehicles and components thereof. An embodiment may reduce the possibility of the release of contaminants washed from an object into the environment through a drainage system, or the concentration of contaminants in water recirculated for use in washing further objects. The invention finds particular application in locations where a large number of objects are washed on a regular basis.

BACKGROUND OF THE INVENTION

Environmental regulations exist in most localities requiring commercial vehicle wash stations to incorporate a separation system for removing a substantial portion of particulates and hydrocarbon contaminants from fluid that has been used to wash a vehicle prior to the fluid being released from the station. Such separation systems usually comprise a charcoal filter together with a dam and weir arrangement.

While separation systems commonly in use do reduce the amount of contaminants there is nevertheless contaminating material in the fluid released from the wash station. In order to avoid the efficiency of the separation system from being reduced it is necessary to clean the separation system regularly.

Many authorities also require that such stations be housed to thereby avoid rain and the resultant water run-off from passing through the separation system and washing out the trapped contaminants. This escalates costs for the operator by forcing the construction of a permanent structure over the station to prevent access of rainwater to the separation system.

SUMMARY OF THE INVENTION

It is an aim of the present invention to ameliorate at least one of the problems of the prior art.

In a first aspect of the invention there is provided a station for washing an object, the station comprising:

- a pit for receiving fluid that has been used to wash the object, the pit in use being located substantially underneath the object;
- rubble located within the pit and arranged to filter the fluid prior to the fluid exiting from the pit through an outlet means to a separation means for removing further contaminants from the fluid; and
- means for suspending the object above the rubble and arranged in a manner such as to avoid packing down of the rubble in use.

The rubble in the pit acts as a coarse filter by removing some of the hydrocarbon substances, particulates and larger debris washed from the object by the fluid before the fluid passes to the separation means. By using the rubble, the rate of sludge build up in the separation means can be reduced allowing intervals between the cleaning of the separation means to be lengthened. Moreover, by reducing the amount of contaminants flowing into the separation means a reduction in contaminants escaping to the drainage system or which are recirculated may be achieved.

The pit will usually be defined by side walls and a base that are formed from a material substantially impermeable to the fluid to thereby inhibit the escape of contaminants to the environment. Generally, the material will be concrete.

Typically, the side walls of the pit are formed by a frame that protrudes above the ground surface immediately surrounding the pit to thereby inhibit the entry into the pit of rain run-off or water used to wash down the surrounding ground surface.

Preferably, the means for suspending will comprise at least one grating that extends across the pit.

In one embodiment, the station further comprises a means for covering the pit if desired in a manner such as to avoid any fluid from entering the pit from above.

By providing such a covering means the requirement to construct a permanent shelter over the station can be avoided resulting in cost savings to the operator of the station.

The rubble may comprise building or other debris or may for instance be selected from the group comprising scoria, gravel, slag or like material. Preferably, slag is used as the filter material.

The invention will be further described hereinafter with reference to a preferred, non-limiting embodiment of the invention illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a pit defined by a containment barrier of a station embodied by the present invention;

Figure 2 is a plan view of a separation system of a station of the invention; and

Figure 3 is a side view of the separation system of Figure 2.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE PRESENT INVENTION

Figure 1 shows a pit 1 of a station for washing vehicles. The pit is defined by a containment barrier 2 formed from opposite concrete side members 3 and end members 4. Containment barrier 3 protrudes above a surrounding ground surface indicated by the numeral 20 to thereby inhibit the entry into the pit of ground surface water resulting from rain or the hosing of the ground surface.

Pit 1 contains a 200mm thick bed of slag 5 over a base 6 of the pit which is also formed from concrete and is sloped such that water that has been used to wash a vehicle

is directed to outlet pipe 7 leading to separation means 8 shown in Figure 2.

The bed of slag 5 acts as a coarse filter by trapping some particulates and larger debris in the pit as the water flows to outlet pipe 7. Grease and oil may also adhere to the slag and so be removed from the water flow.

The containment barrier 3 and base 6 defining the pit are substantially impermeable to the water and hydrocarbon materials thereby inhibiting the likelihood of escape of the contaminants to the surrounding ground.

In use, a vehicle is supported over the pit by platform means so that the water used to wash the vehicle falls into the pit. The platform means also prevents the weight of the vehicle from packing down the slag which would inhibit the flow of the water to outlet pipe 7, and so cause a build-up of water in the pit.

It will be appreciated that pit 1 may be located between bays that allow a number of vehicles to be washed simultaneously and wherein the water and contaminants washed from the vehicles empty into the pit from gutters leading from the bays. In such instances, the platform means is not required.

The platform means in the illustrated embodiment comprises a pair of gratings 9 which extend across base 6 and alongside opposite sides of the pit formed by concrete side members 3. The gratings are supported over the base of the pit by supports 10 and avoid pooling of water falling on the platform means from the washed vehicle by allowing passage through to the underlying bed of slag 5. A ramp (not shown) allows the vehicle to be driven onto the gratings.

In other embodiments the platform means may comprise a single grating 9 extending across the pit, or one or more platforms that are sufficiently sloped to allow the water and contaminants to wash into gutters which empty into the pit below.

When pit 1 is not in use, cover 11 wrapped around reel

12 can be drawn over the pit to thereby inhibit the entry of rain and surface ground water into the pit. When it is desired to use the pit, cover 11 can then be simply retracted onto reel 12 to allow the vehicle to be driven onto gratings 9. By providing cover 11 the necessity for a costly permanent structure to be constructed over the pit can be avoided.

Separation means 8 may consist of any conventionally known separation system. For explanatory purposes, one such system will be described hereinafter with reference to Figures 2 and 3.

The separation means shown consists of a tank 12 housing a series of baffle plates 13a to 13c forming a dam and weir arrangement as indicated in Figure 3. In use, water carrying any contaminants from pit 1 enters tank 12 from pipe 7 and empties into the dam formed by baffle plate 13a where hydrocarbon materials are removed from the surface of the dam by skim pipe 14 which leads to charcoal filter 15. The remaining water in the dam subsequently flows over baffle plates 13b and 13c as indicated by the arrows in Figure 3. Baffle plates 13b and 13c trap particulates and other larger debris prior to the water flowing through charcoal filter 15 and out water vents 16. The water vents lead to a holding tank (not shown) where further settling takes place before the water is released to a drainage system or recirculated for use in washing another vehicle.

As contaminants are removed from the water by the bed of slag 5 in pit 1, the rate of contaminant accumulation in separation means 8 is reduced leading to a reduction in the interval between the cleaning of the separation means which is facilitated by removal of baffle plates 13a to 13c and cleaning or replacement of the charcoal filter.

Cleaning of the pit can be achieved by removing gratings 9 from the pit and scooping out the bed of slag 5 such as with the use of a small motorised front-end loader.

If desired, fresh rubble can be placed into the pit or alternatively, the used gravel can be placed in an agitator and washed with known solvents to remove accumulated contaminants before the slag is returned to the pit.

Although the present invention has been described hereinbefore with reference to preferred embodiments, it will be appreciated by the skilled addressee that numerous variations and modifications are possible without departing from the scope of the invention which is defined in the following claims.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A station for washing an object, the station comprising:

- a pit for receiving fluid that has been used to wash the object, the pit in use being located substantially underneath the object;
- rubble located within the pit and arranged to filter the fluid prior to the fluid exiting from the pit through an outlet means to a separation means for removing further contaminants from the fluid; and
- means for suspending the object above the rubble and arranged in a manner such as to avoid packing down of the rubble in use.

2. A station as claimed in claim 1 wherein the pit is defined by side walls and a base that are each formed from a material substantially impermeable to the fluid.

3. A station as claimed in claims 1 or 2, further comprising a means for covering the pit if desired in a manner such as to avoid any fluid from entering the pit from above.

Dated this 3rd day of November 1998

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By his Patent Attorneys

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52868/98

FIG.1

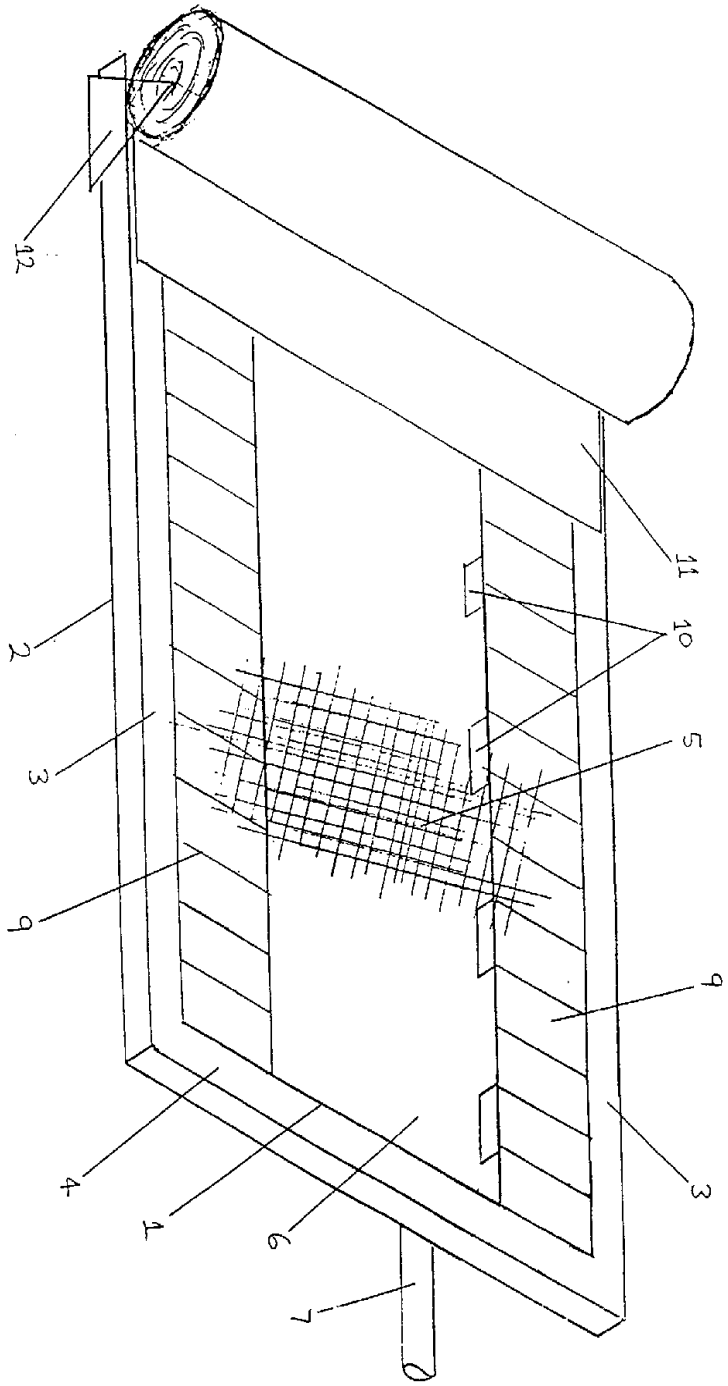

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FIG. 2

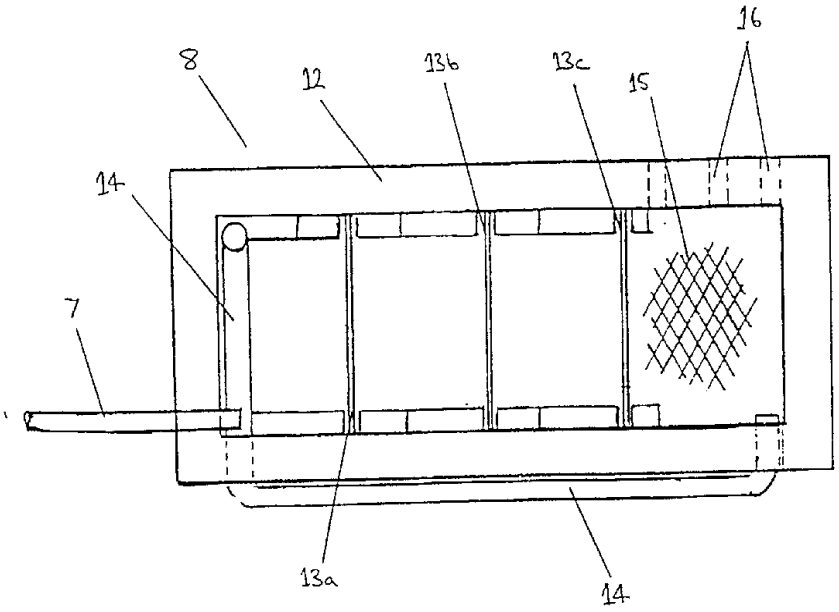

FIG. 3