

IMPROVED EXFILTRATION APPARATUS

TECHNOLOGY OVERVIEW

The invention is an exfiltration apparatus that removes pollutants from runoff captured off the roadways. Pollutants may include oils, soil, tire, rubber, metallic traces, nutrients, organic chemicals and compounds among others. Such materials lead to the clogging of filtering trenches by the roadside, a situation that worsens during the snowmelt and heavy rains. The device construction consists of two main parts, a base and a removable top layer. The top portion contains the first filtering layer which removes the large suspended particles from the run-off and a metallic grate to protect it. The base has bottom and side portions that define the flow of the liquid, and a second filtering layer which filters the finer particles from the liquid. A geotextile material serves as a barrier between the two filtering layers, and between the second filtering layer and the drain. The filtration device is not attached to the road construction and can be easily removed for cleaning, enabling low maintenance. A variety of materials such as porous concrete, sand, porous asphalt, garnet, granular plastic or activated carbon can be used for filtering.

POTENTIAL FIELDS OF USE

The most important application of the technology would be to facilitate drainage in highways and other roadways. The device can also be used to filter run-off water from parking lots and provide a basic filtration mechanism in any application that requires cleaning water or any other fluid. The roads, streets and highways maintenance industry is an estimated \$37 billion market, which would greatly benefit from an efficient and low maintenance drainage technology (Market figures: IBISWorld 2008 Study). The device can provide an alternative to significantly reduce soil and water contamination caused by pollutants in roadway run-offs, which has become a major environmental concern raised by the US Environmental Protection Agency (EPA).

BENEFIT ANALYSIS

The technology provides a number of benefits over existing exfiltration techniques:

- High flexibility in terms of physical configuration; permitting alterations in device size, fabrication of the base from one or several pieces, provisioning of a sealing element, use of an number of filtering layers and use of a range of filtering materials to meet specific cost or functional requirements.
- Enhances the cost effectiveness of the highway drainage system by reducing the requirement of drainage trenches being replaced or cracked open due to clogging. Also, maintenance costs are lowered significantly.
- Reduces damage to the drainage mechanism by providing sufficient strength to withstand heavy traffic conditions. (ease of maintenance)
- Eliminates any requirement of having to dig the roadside for cleaning and replacing of the filtration device due to its modular de-attachable construction.

STAGE OF DEVELOPMENT

The proposed device prototype has been constructed and tested in physical conditions to assure that it fulfills claims of improved performance, effective operation and low-cost installation.

FUTURE DEVELOPMENT

Further alterations can enhance the functional productivity of the device. At sites that are prone to flooding, a vertical pipe can be added to shunt overflow liquid directly to the drainage pipe.

LICENSING OPPORTUNITIES

The patent application for this technology has been filed. Licensing opportunities are available.

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