

EXFILTRATION APPARATUS

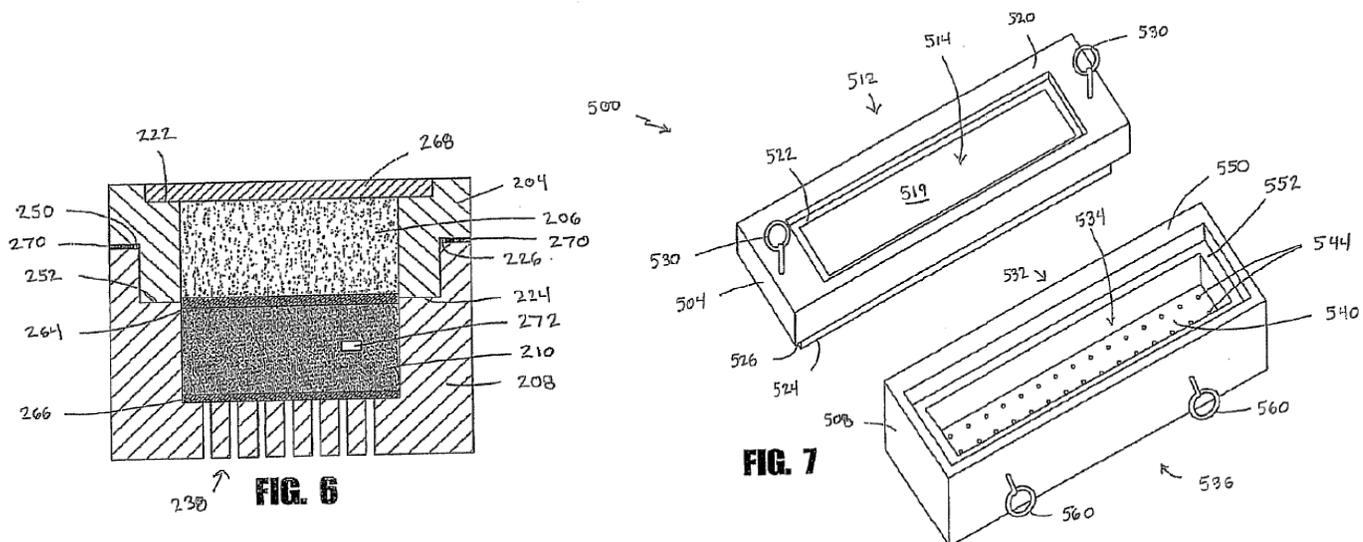
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Overview

The invention is an exfiltration apparatus that removes pollutants from runoff captured off the roadways. Pollutants may include oils, tire rubber, soil, 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 snow melt 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.

Commercial Application

- Facilitate storm drainage on highways and other roadways
- Filter run-off from parking lots and other large, hard surface areas susceptible to polluted run-off



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Benefits

- 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 a number of filtering layers and use of a range of 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
- Reduces damage to the drainage mechanism by providing sufficient strength to withstand heavy traffic conditions.
- Eliminates requirement of having to dig the roadside for cleaning and replacing of the filtration device.

Inventor

Chair of the Department of Civil Engineering from 1995-2013, Dr. Gayle F. Mitchell is the director of the Ohio Research Institute for Transportation and the Environment (ORITE), which she helped establish in 1987. In addition to her administrative role, Dr. Mitchell has contributed to the teaching of undergraduate and graduate courses in the environmental area, as well as undergraduate basic engineering courses. She has developed and presented workshops on water treatment, solid waste management, and erosion and sediment control. During her professional career, she conducted research on physical/chemical treatment of water and wastewater, erosion and sediment control, wetlands, mitigation of storm water runoff, components of solid waste landfills, highway winter maintenance, and application of probes for subsurface investigations. She is a registered Professional Engineer in Ohio and Mississippi.

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