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(54) **SMOKE AND CLEAN AIR GENERATING MACHINE FOR DETECTING PRESENCE AND LOCATION OF LEAKS IN A FLUID SYSTEM**

(75) Inventors: **Kenneth Alan Pieroni**, Fullerton, CA (US); **Jim El Saffle**, Santa Monica, CA (US)

(73) Assignee: **EnviroTech, Inc.**, Costa Mesa, CA (US)

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G01M 3/04 (2006.01)

(52) **U.S. Cl.** **73/40.7**

(58) **Field of Classification Search** 73/40.7
See application file for complete search history.

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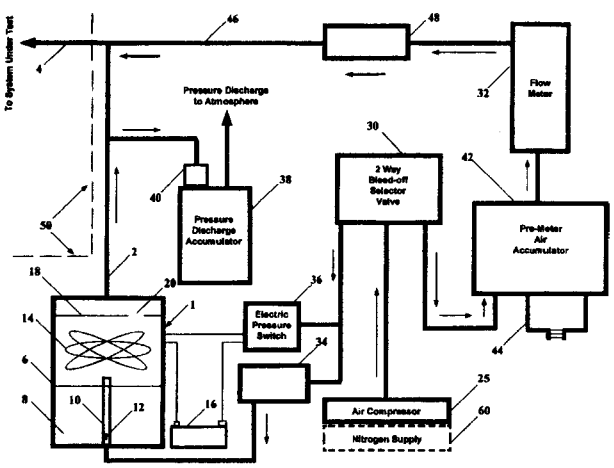
(57) **ABSTRACT**

A smoke and clean air generating machine for detecting the presence and location of leaks in a fluid system (e.g. the evaporative or brake system of a motor vehicle). A source of gas (e.g. air or nitrogen) under pressure is delivered to a smoke generating apparatus or to a flow meter by way of a multi-position selector valve. With the selector valve in a first position, gas is delivered to the system under tests via the flowmeter to detect the presence of a leak in need of repair depending upon the reading of the flow meter. With the selector valve in a second position, gas is delivered to the smoke generating apparatus so that smoke can be supplied to the system under test to locate the leak. With the selector valve in a third position between the first and second positions, pressure is bled from the machine to disable the smoke generating apparatus and thereby terminate the production of smoke.



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EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **9** is determined to be patentable as amended.

New claim **10** is added and determined to be patentable.

Claims **1-8** were not reexamined.

9. A method for generating smoke for use at a volatile, potentially explosive environment, said method comprising the steps of:

locating a heating element within a closed smoke producing chamber, said smoke producing chamber having a gas inlet and a smoke outlet;

delivering a flammable fluid to said heating element within the closed smoke producing chamber;

energizing said heating element for vaporizing into smoke [and] *within the closed smoke producing chamber* the flammable fluid that is delivered thereto;

blowing a supply of non-combustible gas under pressure into the closed smoke producing chamber by way of said gas inlet thereof for (1) creating an inert environment within said chamber so as to prevent ignition and thereby avoid the possibility of an explosion when said flammable fluid is vaporized into smoke by said heating element and (2) for carrying the smoke to the volatile potentially [hazardous] *explosive* environment by way of the smoke outlet of the closed smoke producing chamber, *said volatile potentially explosive environment being a closed system undergoing testing for leaks; and*

connecting the smoke outlet of said closed smoke producing chamber to the closed system undergoing testing, said supply of non-combustible gas for creating an inert environment within the closed system to which the smoke is carried, said inert environment with the closed system preventing ignition within the closed system during the testing thereof;

wherein the closed system to be tested for leaks at the volatile, potentially explosive environment is the evaporative system of a motor vehicle including a fuel tank, further comprising delivering smoke from the smoke outlet of said smoke producing chamber to the fuel tank.

10. The method for generating smoke recited by claim 9, comprising the additional step of regulating the pressure at which the smoke is carried by said non-combustible gas from said closed smoke producing chamber to the closed system undergoing testing.

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