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[54] **TREATING NON-NATURALLY OCCURRING SUBSURFACE SOIL CONTAMINANTS WITH PNEUMATIC INJECTION OF DRY MEDIA**

[75] Inventors: **John R. Schuring**, Blairstown; **Thomas M. Boland**, Andover; **Trevor C. King**, Maplewood, all of N.J.

[73] Assignee: **New Jersey Institute of Technology**, Newark, N.J.

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Related U.S. Application Data

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[51] **Int. Cl.**⁷ **B09C 1/08; B09C 1/10; E21B 43/26**

[52] **U.S. Cl.** **166/53; 166/177.5; 166/191; 166/223; 166/242.1; 175/67; 405/128**

[58] **Field of Search** **166/53, 191, 177.5, 166/223, 242.1, 242.5, 280, 308, 332.8; 111/7.4; 175/67; 210/170, 747; 405/128; 435/262.5; 588/253, 900**

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Primary Examiner—George Suchfield
Attorney, Agent, or Firm—Klauber & Jackson

[57] ABSTRACT

An apparatus for pneumatically fracturing a soil formation, and thereafter utilizing or maintaining the fracture network thus formed by continuous injection of a gas stream into the fracture network, and introducing into that gas stream dry media which is entrained in the gas stream and thereby dispersed and distributed through the soil formation in substantially predictable or predetermined patterns, is described. The fracture network and/or the dry media contained therein create or enhance usefulness for a given purpose with respect to the soil formation. The primary usefulness of the apparatus is concerned with remediation of contaminated soil formations, although it can be used to inject chemical agents into soil formations for the purpose of managing plant life rooted in those soil formations, to inject propping agents into soil formations for the purpose of maintaining the fracture network in order to create subsurface drainage galleries, and to inject electrically conductive materials for in situ vitrification to create subsurface vitrified masses not only for isolating contaminants within a soil formation, but for use in creating or reinforcing building foundations and supports for other structures, preventing subterranean water movement, and repairing or preventing damage to or leaks from underground electrical power, telephone, television and fiber-optics cables, pipelines for natural gas and oil, water mains and lines, and septic and storm sewer drains.

41 Claims, 18 Drawing Sheets

