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Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, or importing into the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

David J. Kappas

Director of the United States Patent and Trademark Office



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Kumano

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(54) **FLUID ACTIVATION APPARATUS**

2003/0196946 A1* 10/2003 Denzer 210/223

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 640 days.

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Primary Examiner—David A Reifsnnyder

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(51) **Int. Cl.**

C02F 1/48 (2006.01)

(57) **ABSTRACT**

(52) **U.S. Cl.** **210/222; 210/695; 335/302; 335/303; 335/306**

Two assembled bodies arranged as a pair are disposed around the outside periphery of a pipe to activate water flowing in the pipe. Each of the assembled bodies is composed of a cover and fluid activating bodies integrally fixed in the cover with an epoxy resin. Each of the fluid activating bodies is composed of a black radiation sintered body made by sintering the powder of a plurality of kinds of metal oxides at high temperature and an electromagnetic wave converging body for converging the electromagnetic wave radiated from the black radiation sintered body to a predetermined wavelength. The two covers are disposed around the outside periphery of the pipe, and fixing portions formed on both the sides of the covers are integrally fixed by fixtures, respectively.

(58) **Field of Classification Search** 210/222, 210/223, 695; 335/302, 303, 306
See application file for complete search history.

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8 Claims, 4 Drawing Sheets

