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(54) **SIGNAL PROCESSOR APPARATUS FOR ROTATING WATER CURRENT METER**

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(56) **References Cited**

U.S. PATENT DOCUMENTS

4,282,883 A 8/1981 Yerushalmy
4,481,503 A * 11/1984 Lehman et al. 340/518

4,658,832 A 4/1987 Brignoli
4,940,976 A 7/1990 Gastoimiotis et al.
5,016,273 A * 5/1991 Hoff 380/10
5,553,493 A 9/1996 Box et al.
5,847,288 A 12/1998 Hutchinson
6,340,243 B1 * 1/2002 Deane et al. 374/24
6,424,820 B1 * 7/2002 Burdick et al. 455/41

* cited by examiner

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(57) **ABSTRACT**

The present invention comprises a hand held, battery operated water current velocity measuring device designed for use with contact closure water current meters. The apparatus differentiates and amplifies incoming DC signals generated by the current meter into both AC and DC signals, which are then sent to a microprocessor. The microprocessor, using operations research processing, samples and evaluates both signals to determine if a contact closure has occurred (e.g., when the current meter has completed a revolution) and to distinguish an actual contact from external voltage or spurious noise pulses. Once the microprocessor has verified the occurrence of a contact closure, the microprocessor alerts the operator to the contact closure. The information may be transmitted via FM band radio frequency to one or more appropriately tuned FM radios.

18 Claims, 2 Drawing Sheets

CURRENT METER SIGNAL PROCESSOR

