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**DeVerse**

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(54) **AUTOMATED SYSTEM FOR MONITORING AND MAINTENANCE OF FLUID LEVEL IN SWIMMING POOLS AND OTHER CONTAINED BODIES OF WATER**

3,848,627 A \* 11/1974 Page ..... 137/392  
4,115,877 A \* 9/1978 Wall ..... 4/508  
4,194,691 A \* 3/1980 Birnbach et al. .... 239/63  
4,373,815 A 2/1983 Bruce  
4,380,091 A \* 4/1983 Lively ..... 4/508

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(Continued)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 245 days.

**FOREIGN PATENT DOCUMENTS**

WO WO 2006067148 A2 \* 6/2006 ..... G01F 23/26

**OTHER PUBLICATIONS**

Machine Translation of Barlesi et al. WO 2006/067148.\*

(Continued)

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**E04H 4/12** (2006.01)

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USPC ..... 73/304 C, 304 R; 137/386, 392, 393  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,538,746 A 11/1970 Jacobs et al.  
3,732,556 A 5/1973 Caprillo et al.  
3,739,405 A 6/1973 Schmidt

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(57) **ABSTRACT**

An automated system for monitoring and maintaining fluid level in a swimming pool, spa, or other environment containing water is provided. The system includes a sensor assembly having a microprocessor and a proximity sensor encapsulated in a non-conductive material. A lower section of the sensor assembly has a flat profile and at least a portion of the proximity sensor is positioned in the lower section. The sensor assembly transmits a signal to a remote controller when the water level measured is above or below a predetermined target value. The remote controller in turn causes a remote water valve to turn on or off. In certain implementations, the sensor assembly incorporates a precision mounting system and algorithm, which work together to provide the end user with a means to mount the sensor easily and maintain precise operational level of the water. The combination of the physical mounting system and the range and resolution of the proximity sensor allow for precise maintenance of water level at the preferred level.

**6 Claims, 14 Drawing Sheets**

