



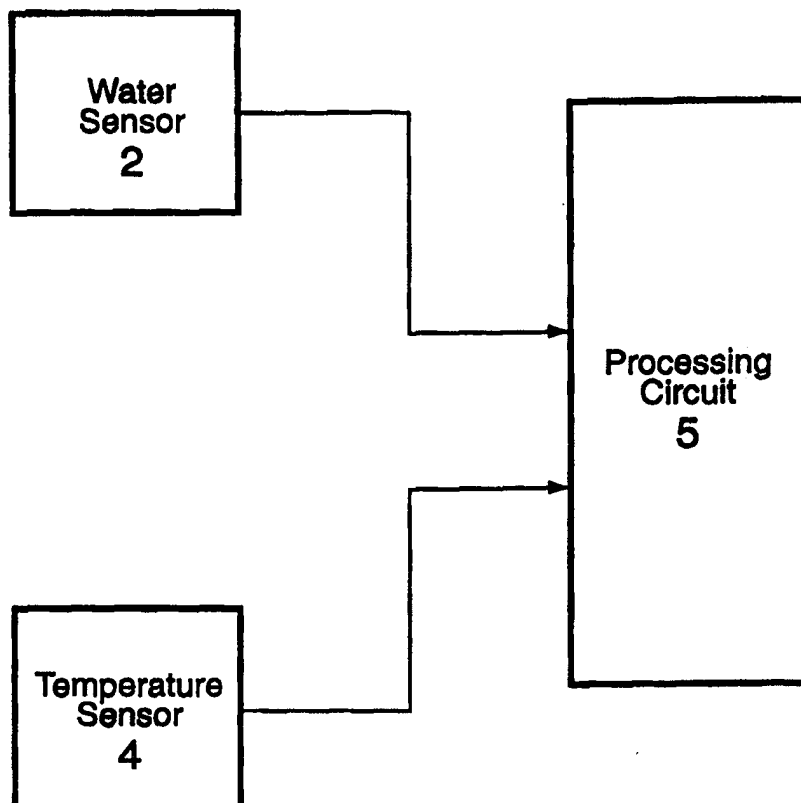
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60/060,058	25 September 1997 (25.09.97) US	Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	
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(54) Title: METHODS AND SYSTEMS FOR SENSING WATER IN LIQUIDS

(57) Abstract

The present invention provides a water sensing system for sensing the water content of a liquid and communicating water content information to an operator. Communicating water content information may include processing the sensed water content value and comparing the value to one or more threshold values to qualify the sensed value. According to another aspect, the water sensor includes isolated 4-20 mA interface outputs for use with external devices such as programmable logic controllers. According to another aspect, the present invention provides a water sensing system which senses a relative water content value and converts the relative water content value to an absolute water content value. According to another aspect, the present invention includes methods and circuitry for calibrating a water sensing system. According to yet another aspect, the present invention provides a liquid purification system to sense the water content of a liquid and remove water from the liquid using a purifier.



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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/07460

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G01N33/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 141 636 A (ANDERSON STRATHCLYDE PLC) 15 May 1985 see page 2, line 13 - page 4, line 26; figures 1-5 ---	1-5, 12-16
X	EP 0 646 785 A (LVE VERFAHRENSELEKTRONIK GMBH) 5 April 1995 see column 4, line 42 - column 6, line 23; figures 1-3 ---	1-5, 12-16
X	DE 38 16 315 A (KIENINGER & OBERGFELL, FABRIK FÜR TECHN. LAUFWERKE UND APPARATE GMBH) 21 December 1989 see column 3, line 63 - column 11, line 35; figures 1-4 --- -/--	1-5, 12-16



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

22 July 1998

Date of mailing of the international search report

16. 12. 98

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/07460

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 504 790 A (FRANT) 12 March 1985 see column 3, line 29 - column 6, line 10; figures 1-4 -----	1-5, 12-16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 98/07460

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-17, 28-30

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-17,28-30

System and method for sensing water in another liquid.

2. Claims: 18-21,31

System and method for removing water from a liquid

3. Claims: 22-27,32-35,37

calibration of systems for measuring water content of liquids

4. Claim : 36

regulation of light intensity of the display of a sensing system

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/07460

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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EP 646785	A	05-04-1995	DE 4333540 A	06-04-1995
DE 3816315	A	21-12-1989	DE 3816314 A	23-11-1989
US 4504790	A	12-03-1985	NONE	