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(54) Title: EFFECTIVE ROOT ZONE USE IN CROP MANAGEMENT

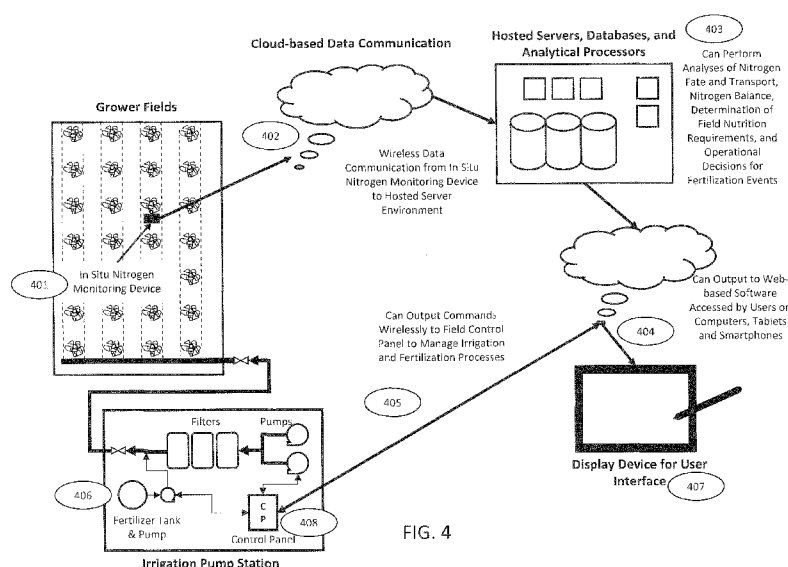


FIG. 4

(57) Abstract: Embodiments of the present disclosure relate generally to nutrient monitoring in an agricultural field, and more specifically to systems, devices, and methods for tracking the fate and transport of nitrogen in agricultural environments and for determining an effective root zone of a crop.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/32611

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06F 11/00 (2012.01)

USPC - 702/188

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(8)- G06F 11/00 (2012.01);

USPC- 702/188

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

USPC- 702/189; 701/51; 366/167.1, 184;

Patents and NPL (classification, keyword; search terms below)

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

PubWest (US Pat, PgPub, EPO, JPO), GoogleScholar (PL, NPL), FreePatentsOnline (US Pat, PgPub, EPO, JPO, WIPO, NPL);

search terms: root, effective, zone, uptake, value, moisture, nitrogen, level, depth, deep, increment, measure, sensor, detect, monitor, drain, drainage

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 98/04915 A1 (NOMURA et al.) 05 February 1998 (05.02.1998), Figs. 2, 3; pg 4, ln 18 to pg 5, ln 26; pg 5, ln 8-24; pg 12, ln 5 to pg 13, ln 18; pg 16, ln 6-14; pg 18, ln 23 to pg 19, ln 4; pg 21, ln 17-33	1-62
Y	US 2010/0306012 A1 (ZYSKOWSKI et al.) 02 December 2010 (02.12.2010), Fig. 21; para [0009]-[0014], [0034], [0037], [0065], [0068], [0071], [0080], [0083], [0084], [0087], [0090], [0092], [0111], [0122], [0128]-[0141], [0145], [0168]-[0175], [0179], [0181], [0184], [0205], [0206], [0227], [0237], [0246]	1-62
Y	US 2004/0100394 A1 (HITT) 27 May 2004 (27.05.2004), para [0027]-[0104]	1-62
Y	US 2003/0066357 A1 (UPADHYAYA et al.) 10 April 2003 (10.04.2003), para [0015]-[0143]	1-62
Y	GLANCEY et al. "Prediction of agricultural implement draft using an instrumented analog tillage tool." Soil and Tillage Research [online], April 1996 [Retrieved on 26-06-12], Vol 37, Iss. 1, pp. 47-65, Retrieved from the Internet: <URL: http://www.sciencedirect.com/science/article/pii/0167198795005072 > see entire document, especially Figs. 1-7	1-62

☐ Further documents are listed in the continuation of Box C.

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