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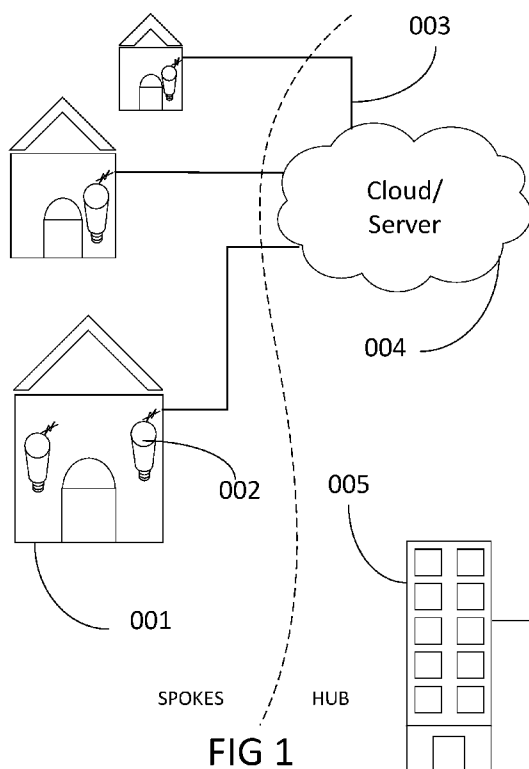
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[Continued on next page]

(54) Title: INTUITIVE SYSTEM



(57) Abstract: Various embodiments include an "Intuitive System" which detects the state of grid power at home or in commercial places and/or regions and manages the operation of various electrical and electronic systems accordingly. In various embodiments, a server may receive data from devices positioned throughout the grid. The server may aggregate, analyse, present, and/or act upon the received data. The system may enable providers to manage the health of grid power, monitor reports of power failures, analyse causes and durations of failures, engage in demand response, determine peak power demands, etc. The system may actively reduce demands for power, including, for example, by selectively reducing grid power available to constituents. However, constituents may have the capability to turn to back-up power systems, whose existence may be a determining factor in which constituents receive reduced grid power. The Intuitive System may also reduce grid load by turning down high-power devices.



Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*

(88) Date of publication of the international search report:
18 August 2016

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US15/66222

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06F 1/30; G08B 25/06, 25/08 (2016.01)

CPC - G06F 1/30; G08B 25/06, 25/08

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) Classification(s): G06F 1/30; G08B 25/06, 25/08 (2016.01)

CPC Classification(s): G06F 1/30; G08B 25/06, 25/08; Y02E 60/7892; Y04S 10/30, 10/522, 10/525

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 practicable, search terms used)

PatSeer (US, EP, WO, JP, DE, GB, CN, FR, KR, ES, AU, IN, CA, INPADOC Data); IEEE; Google Scholar; EBSCO

Keywords searched: electrical power grid, communication port, server, processor, remedial action, power strain, back up power, location, electrical parameter sensors

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012/0046891 A1 (YANEY, D. et al.) February 23, 2012; figures 1-3, 6-10; paragraphs [0027, 0037-0044, 0058, 0066, 0083-0107]	1-4
A	US 2013/0123997 A1 (KING, C. et al.) May 16, 2013; entire document	1-4
A	US 2011/0270550 A1 (KREISS, D. et al.) November 3, 2011; entire document	1-4



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"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

11 April 2016 (11.04.2016)

Date of mailing of the international search report

02 MAY 2016

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US15/66222

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See Extra 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 additional fees, this Authority did not invite payment of additional fees.
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.:
1-4

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US15/66222

****-Continued from Box III Observations where unity of invention is lacking -****

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-4 are directed towards a system for detecting the location of an electrical disruption in an electrical grid by transmitting electrical power levels at two separate locations detected by separate sensors to a server.

Group II: Claims 5-20 are directed towards reducing power use by an appliance below a permissible power level based on a detected level of electrical power sensed in an electrical network.

The inventions listed as Groups I-II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features.

Group I has at least a server comprising: a server communications port; a server memory; and a server processor; a second device at a second location, receiving a second level of power at a second location, determine, based on the first indication, the second indication, the first location, and the second location, a third location on the power grid that has encountered a disruption; and direct the server communications port to transmit an indication of a remedial action to a responsible party, that Group II does not have. Group II has at least a set of two or more active appliances; operating a first appliance at a second level of power drawn from the electrical grid; a first permissible level of power; a determination that the electrical grid is not operating in a healthy manner; and reducing the first appliance's consumption of power from the electrical network, that Group I does not have.

The common technical features of Groups I and II are a power grid including one or more power lines, a device electrically coupled to the grid comprising: a sensor for detecting electrical power at its respective location on the power grid, a device communications port, a device memory, and a device processor; and transmitting a first indication of a first level of electrical power.

The common technical features are disclosed by US 2013/0123997 A1 to King, C. et al. (hereinafter "King"). King discloses a power grid including one or more power lines (an electrical grid including power lines 104; figures 2; paragraph [0027]), a device electrically coupled to the grid comprising: a sensor for detecting electrical power at its respective location on the power grid (an electricity meter 102 coupled to power lines 104 of the grid including sensor 114 for sensing voltage (power level); figures 2; paragraphs [0028-0029], [0032]), a device communications port, a device memory, and a device processor (a communication module 112, a memory 110, and a processor 108 of the meter 102; figure 2; paragraphs [0028-0029]); and transmitting a first indication of a first level of electrical power (the communication module 112 sends a signal indicating the voltage (first level of electrical power); figure 2; paragraphs [0028-0029], [0032]).

Since the common technical feature is previously disclosed by the King reference, these common features are not special and so Groups I and II lack unity.