(54) Title: ARTICLE LOCATING AND TRACKING APPARATUS AND METHOD

(57) Abstract: An activity based monitoring system (10) is disclosed, the activity based monitoring system (10) being configured to monitor a plurality of badges (12) associated with a plurality of assets within a healthcare facility.
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(88) Date of publication of the international search report: 3 March 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G08B21/04 G08B21/22 A61B5/11

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 7 G08B A61G A61B

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)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
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<tbody>
<tr>
<td>X</td>
<td>DE 101 27 156 A (DAUBLEBSKY PETER) 5 December 2002 (2002-12-05) column 1, lines 5-7,9-46 paragraph [0007] column 5, line 67 - column 6, line 9</td>
<td>1-6,13, 22</td>
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<td>Y</td>
<td>US 6 524 239 B1 (BOUTON FRANK M ET AL) 25 February 2003 (2003-02-25) column 2, lines 21-28 column 4, lines 7-42,60-67 column 5, line 22 - column 6, line 25 column 11, line 66 - column 12, line 9</td>
<td>7</td>
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</table>

Further documents are listed in the continuation of box C. Patent family members are listed in 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 document but published on or after the international filing date
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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
  *A* document member of the same patent family

Date of the actual completion of the international search 1 October 2004

Date of mailing of the international search report 21.12.2004

Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk, Tél.(+31-70) 340-2040, Tx. 31 651 epo nl, Fax:(+31-70) 340-3016

Authorized officer Meister, M
INTERNATIONAL SEARCH REPORT

Box 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 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 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.:

1-13,15-20,22

Remark on Protest

☐ The additional search fees were accompanied by the applicant’s protest.

☐ No protest accompanied the payment of additional search fees.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13,15-20,22

System for tracking a plurality of movable assets in a healthcare environment, the system comprising a plurality of badges coupled to the assets and a locating system configured to determine if the height of the asset is an expected height, wherein the locating system is further configured to receive equipment status information from a sensor associated with a piece of equipment positioned in the healthcare environment.

2. claims: 1,14,80-88

System for tracking a plurality of movable assets in a healthcare environment, the system comprising a plurality of badges coupled to the assets, each badge including a transmitter and a displacement sensor, and a locating system configured to determine the location of the plurality of badges based on the transmitter identifying signals and on the motion information collected by the displacement sensors.

3. claims: 1,21

System for tracking a plurality of movable assets in a healthcare environment, the system comprising a plurality of badges coupled to the assets and a locating system configured to prevent the movement of a first asset based on the location of at least a second asset.

4. claims: 23-29

Method for monitoring an asset to determine if the asset has been dropped or fallen, wherein the asset is coupled to a badge having an accelerometer configured to monitor a vertical acceleration of the asset and a transmitter, and wherein an asset is identified as having dropped or as having fallen on the base of the vertical acceleration exceeding a threshold value.

5. claims: 30-64
System for tracking a plurality of movable assets in a healthcare environment, the system comprising a plurality of badges coupled to the assets, a locating system configured to determine the location of the badges, and at least one portable device being configured to generate a request signal for requesting the location of a badge, receiving a location signal from the locating system and providing appropriate directions based on the location of the badge for which the location was requested.

6. claims: 65-79

System for tracking a plurality of movable assets in a healthcare environment, the system comprising a plurality of badges coupled to the assets, a locating system configured to determine the location of the badges, and a virtual facility interface adapted to present a virtual facility including a map of the facility and representations of various assets having a badge associated therewith, the representations being positioned within the virtual facility based on the location of each asset, and the representations including multiple representations according to at least two states of the asset.
<table>
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<td>DE 10127156 A</td>
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