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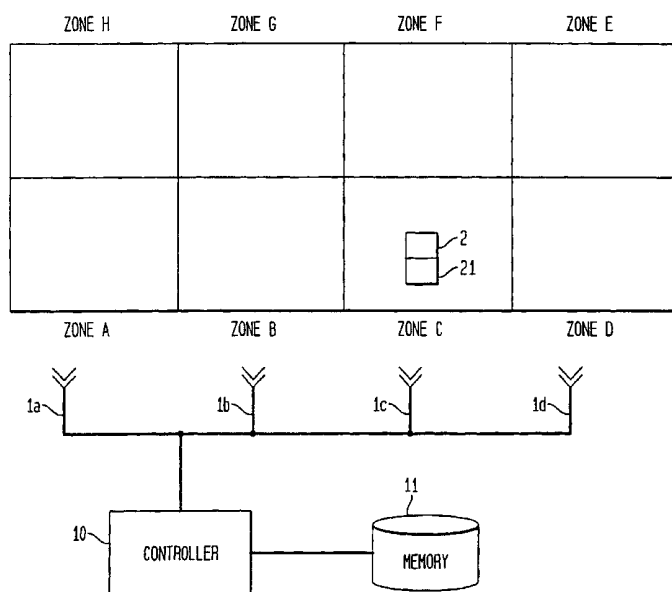
— with international search report

(88) Date of publication of the international search report:

17 January 2002

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR LOCATING MOBILE TAGS



(57) Abstract: A method and apparatus for determining tag location. Tag reference data may be stored, e.g., in the form of a lookup table, as a trained neural network, and so on, and used to determine the location of tags. Readings used to determine tag location and/or preliminary tag locations may be filtered to produce reliable tag location indications. Confidence levels may also be generated for determined tag locations and used, for example, to indicate how well an asset location system can distinguish between different tag locations. Combinations of different tag location processes, such as triangulation and a lookup table process, may be used together to determine tag locations.

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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

Intern. Appl. No.
PCT/US 00/23459

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06K7/00

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 G06K

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, IBM-TDB, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 94 19781 A (KIP HARM JACOB ;NEDAP NV (NL)) 1 September 1994 (1994-09-01) the whole document	1,3,22, 54,55
A	EP 0 245 555 A (LO JACK CORP) 19 November 1987 (1987-11-19) the whole document	1,22
P,A	WO 99 67737 A (PINPOINT CORP) 29 December 1999 (1999-12-29) the whole document	1,22,54, 55



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
- "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

13 December 2000

Date of mailing of the international search report

26. 04. 2001

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/23459

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.:
1-45, 54, 55

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

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-45,54,55

System and method for determining the location of a tag wherein the controller determines a location of the tag based on information stored in the memory regarding communications with the reference tag.

2. Claims: 46-51

A method of determining a location of a tag, comprising: determining a preliminary location for the tag based on the signal; and filtering the preliminary location before using the preliminary location to report the tag location.

3. Claims: 52,53

A method of determining a location of a tag, comprising smoothing the signal representing communication with the tag before using the signal to determine a location of the tag.

4. Claims: 56-61

A method for determining a location of a tag, comprising: determining tag-receiver distances between the tag and the two receiver locations; and determining the location of the tag based on the two tag-receiver distances.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Application No

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