PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT8300525

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
BLUE UMBRELLA LLC	11/29/2023

RECEIVING PARTY DATA

Name:	GAMBA GROUP HOLDINGS LLC
Street Address:	8273 NW 127 LN
City:	PARKLAND
State/Country:	FLORIDA
Postal Code:	33076

PROPERTY NUMBERS Total: 19

Property Type	Number
Patent Number:	7899583
Patent Number:	8836580
Patent Number:	8896485
Patent Number:	7924149
Patent Number:	8866673
Patent Number:	9020687
Patent Number:	8941485
Patent Number:	9374673
Patent Number:	9204257
Patent Number:	9491584
Patent Number:	9602193
Patent Number:	9204251
Patent Number:	9420423
Patent Number:	9538332
Patent Number:	9674684
Patent Number:	9772193
Patent Number:	9961507
Patent Number:	10470013
Patent Number:	10117078

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 9542574319

Email: umendelson@gmail.com

Correspondent Name: EHUD MENDELSON

Address Line 1: 8273 NW 127 LN

Address Line 4: PARKLAND, FLORIDA 33076

ATTORNEY DOCKET NUMBER:	BLU2GAMBA PATENTS1-19
NAME OF SUBMITTER:	EHUD MENDELSON
SIGNATURE:	/EHUD MENDELSON/
DATE SIGNED:	11/29/2023
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 4

source=Patent assignment blue to gamba#page1.tif

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source=Patent assignment blue to gamba#page3.tif

source=Patent assignment blue to gamba#page4.tif

PATENTS ASSIGNMENT AGREEMENT

THIS AGREEMENT is made this day of November 27, 2023, by and between Blue Umbrella llc represent by Ehud Mendelson (the "Assignor"), having its primary place of business at 8273 NW 127 Ln. Parkland Florida 33076 , and Gamba Group Holdings(the "Assignee") having its primary place of business at 8273 NW 127 Ln. Parkland, Florida 33076 (collectively the "Parties").

WHEREAS, Licensor is has invented RF Beacon and Method of use (the "Invention"), and has been granted United States Letters Patents for said invention, Patent No- .See Attach A (the "Patent"), granted on the patent application filed with the United States Patent and Trademark Office.

WHEREAS, Assignee wishes to acquire all right, title and interest in the Patent, and Assignor wishes to sell its interest in the Patent to Assignee.

NOW THEREFORE, in consideration of the mutual promises, covenants, warranties, and other good and valuable consideration set forth herein, and in accordance with applicable law, the Parties hereby agree as follows:

1. *Assignment*. Assignor hereby assigns to Assignee, and its successors, representatives and assigns, all right, title and interest in the Patent including all reexaminations, extensions and reissues thereof. Assignor hereby requests the Commissioner of Patents of the United States to record this assignment of all right, title and interest in the Patent to Assignee.

2. *Payment*. In consideration of the assignment of the Patent pursuant to this Agreement, and of the promises and covenants contained herein, Assignee shall pay to Assignor a fee in the amount Set in Attachment A of this agreement, payable upon execution of sale or licenses of a patent or patents from the list attach A to this Agreement, until such execution will take place it is agree that the Assignor Ehud Mendelson payment/fee will be conceders as a loan to the Gamba Group Holdings llc in the dynamic amount set in the attachment A. Until such execution of sale or license will take place, Ehud Mendelson will receive a personal loan to his business account in the USA (Dba. Blue Umbrella and or search4parking bank account), payment for the loan will payable upon execution of sale or licenses of a patent or patents from the list attach A to this Agreement.

Google Ex. 1029, p. 003

3. *Assignor's Representations and Warranties*. Assignor hereby represents and warrants
i) that it has the legal right and authority to execute this Agreement, and to validly assign the entire interest in the Patent to Assignee,

ii) that it has not executed any other agreement that would conflict with the terms of this Agreement, nor shall it execute any such agreement in the future, and

iii) that to the best of Assignor's knowledge, the Patent is valid and enforceable as of the date of this Agreement. Assignor makes no representations or warranties as to the validity or enforceability of the Patent subsequent to the date of this Agreement.

4. *Patent Status*. Assignee hereby acknowledges that any finding or ruling subsequent to the date of this Agreement that the Patent is invalid or unenforceable shall not give rise to a cause of action against Assignor under this Agreement.

5. *Further Actions*. Assignor hereby agrees to execute any further agreements and to take any further actions necessary to aid Assignee in perfecting its interest in the Patent and in enforcing any and all protections or privileges deriving from the Patent.

6. *Counterparts*. This Agreement may be executed in several counterparts, each of which shall constitute an original and all of which, when taken together, shall constitute one agreement.

7. *Severability*. If any part or parts of this Agreement shall be held unenforceable for any reason, the remainder of this Agreement shall continue in full force and effect. If any provision of this Agreement is deemed invalid or unenforceable by any court of competent jurisdiction, and if limiting such provision would make the provision valid, then such provision shall be deemed to be construed as so limited.

8. *Notice*. Any notice required or otherwise given pursuant to this Agreement shall be in writing and mailed certified return receipt requested, postage prepaid, or delivered by overnight delivery service, addressed as follows:

Google Ex. 1029, p. 004

If to Assignor: Blue Umbrella LLC by her president Ehud Mendelson 8273 NW 127 Ln. Parkland, Florida 33076

If to Assignee: Gamba Group Holdings LLC having its primary place of business at 8273 NW 127 Ln. Parkland, Florida 33076

9 *Headings*. The headings for section herein are for convenience only and shall not affect the meaning of the provisions of this Agreement.

10. Entire Agreement. This Agreement constitutes the entire agreement between Assignor and Assignee, and supersedes any prior understanding or representation of any kind preceding the date of this Agreement. There are no other promises, conditions, understandings or other agreements, whether oral or written, relating to the subject matter of this Agreement.

Attach A List of patents assignment:

Patents #:	Application #:
7899583	US11/396,843
8836580	US11/429,864
8896485	US11/472,706
7924149	US12/069,899
8866673	US12/587,042
9020687	US12/930,735
8941485	US12/932,811
9374673	US13/135,421
9204257	US13/135,421
9491584	US14/285,332
9602193	US14/285,273
9204251	US14/285,209
9420423	US15/086,028
9538332	US15/237,727
9674684	US15/397,685
9772193	US15/403,146
9961507	US15/687,445
10470013	US15/953,389
10117078	US15/972,074

Google Ex. 1029, p. 005

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed the day and year first above written.

ASSIGNOR
Ehud Mendelson
BLVD UMBRELLA LLC. MENDELSON
Signature
EHUD MENDELSON
Print Name

ASSIGNEE
Gamba Group Holdings President
MENDELSON
Signature
EHUD MENDELSON
Print Name

State of FLORIDA)
)
County of BROWARD)

I, the undersigned, a Notary Public in and for said County, in the State aforesaid, DO HEREBY CERTIFY THAT EHUD MENDELSON personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person, and acknowledged that EHUD MENDELS signed, sealed and delivered the said instrument as his/her/their free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and notarial seal, this 27th day of November, 2023

Signature of Notary Public

SELVIRA FLEURY
Notary Public, State of Florida
Commission# GG 958650
My comm. expires Feb. 16, 2024

(Seal) SELVIRA FLEURY
Printed Name of Notary

My commission expires on February 16, 2024

Google Ex. 1029, p. 006

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT5756053

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
GAMBA GROUP LIMITED	10/06/2019

RECEIVING PARTY DATA

Name:	BLUE UMBRELLA LLC
Street Address:	11190 HERON BAY BLVD SUITE 916
City:	CORAL SPRINGS
State/Country:	FLORIDA
Postal Code:	33076

PROPERTY NUMBERS Total: 16

Property Type	Number
Patent Number:	7899583
Patent Number:	7924149
Patent Number:	8836580
Patent Number:	8866673
Patent Number:	8896485
Patent Number:	8941485
Patent Number:	9020687
Patent Number:	9204251
Patent Number:	9204257
Patent Number:	9374673
Patent Number:	9420423
Patent Number:	9491584
Patent Number:	9538332
Patent Number:	9602193
Patent Number:	9674684
Patent Number:	9772193

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone:	9542574319
Email:	umen79@yahoo.com
Correspondent Name:	EHUD MENDELSON
Address Line 1:	11190 HERON BAY BLVD SUITE 916
Address Line 4:	CORAL SPRINGS, DELAWARE 33076

ATTORNEY DOCKET NUMBER:	ASSIGNMENT GAMBA TO BLU8X
NAME OF SUBMITTER:	EHUD MENDELSON
SIGNATURE:	/ehud mendelson/
DATE SIGNED:	10/06/2019
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 3
source=ASSIGNMENT of patents from gamba group to blue umbrella sign and ready#page1.tif
source=ASSIGNMENT of patents from gamba group to blue umbrella sign and ready#page2.tif
source=ASSIGNMENT of patents from gamba group to blue umbrella sign and ready#page3.tif

ASSIGNMENT

WHEREAS, I:

Ehud Mendelson President of **Gamba Group Limited**, a For Profit Corporation organized and existing under the laws of the state of Malta, and having an office and place of business at 262 Triq San Alber, Gzira, Malta, GZR 1152, represent by Ehud Mendelson president of the company which residing, respectively, at: **11190 Heron Bay Blvd. Suite 916, Coral Springs, FL, 33076**,

Which own the patents listed as follow:

Patent#	Application #
7899583	11396843
7924149	12069899
8836580	11429864
8866673	12587042
8896485	11472706
8941485	12932811
9020687	12930735
9204251	14285209
9204257	14285273
9374673	13135421
9420423	15086028
9491584	14285332
9538332	15237727
9602193	14285406
9674684	15397685
9772193	15403146

Google Ex. 1029, p. 009

WHEREAS, **Blue Umbrella Limited Liability company** , a For Profit Corporation organized and existing under the laws of the state of **Nevada** and having an office and place of business at **11190 Heron Bay Blvd. Suite 916, Coral Springs, FL, 33076**,

, is desirous of acquiring the entire interest in said Patents, said United States patents which listed above (page 1) and Currently owns by Gamba Group Limited, and in any patents which may issue thereon

NOW, THEREFORE,

be it known that for and in consideration of **Blue Umbrella Limited Liability company**, and other good and valuable consideration, I do hereby sell, assign, and transfer unto **Blue Umbrella Limited Liability company**, its successors, assigns, and legal representatives, all right, title, and interest in and to said patents listed in page 1 and any improvements thereon for all countries of the world, and in and to said application, including any continuations and divisions thereof, and any substitute applications therefor, and any patents which may issue thereon, and any reissues of the same; and all right, title, and interest in and to every patents application filed on said patents listed in page 1 in any other country, including renewals, revivals, continuations, and divisions thereof, and any substitute applications therefor, and any and all patents which may issue thereon, and any reissues and extensions of the same; and we hereby authorize and request competent authorities to grant and issue any and all patents on said listed in page 1 to **Blue Umbrella Limited Liability company** as the assignee of the entire interest therein; and we further agree to execute upon request of the assignee such additional documents, if any, as are necessary and proper to secure patents protection on said patents throughout all countries of the world, and otherwise to give full effect to and perfect the rights of the assignee under this Assignment.

Google Ex. 1029, p. 010

In Testimony Whereof, I have hereunto signed my name on
The dates indicated hereinafter:

09/20/19
Date

Ehud Mendelson

State of Florida
Country of Broward

Before me a Notary Public for said county, personally appeared Ehud Mendelson, to me know and known to me to be the person who executed the foregoing instrument and acknowledged it to be a free act and deed.

Witness my hand and seal September 20th, 2019.

Notary Public

[Notary Seal]

My Commission expires:
Dec 8, 2019

Google Ex. 1029, p. 011

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/285,273	12/01/2015	9204257	MEN-14-002	9122

31877 7590 11/11/2015

ALLEN D. HERTZ
ALLEN D HERTZ, P.A.
12784 TULIPWOOD CIRCLE
BOCA RATON, FL 33428

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Ehud Mendelson, Coral Springs, FL;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address, and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

31877 7590 10/29/2015
ALLEN D. HERTZ
ALLEN D HERTZ, P.A.
12784 TULIPWOOD CIRCLE
BOCA RATON, FL 33428

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Allen D. Hertz (Via EFS-web)	(Depositor's name)
	(Signature)
October 29, 2015	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/285,273	05/22/2014	Ehud Mendelson	MEN-14-002	9122

TITLE OF INVENTION: INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/29/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
LY, NGHI H	2642	455-456100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Allen D. Hertz, P.A.
2 Allen D. Hertz
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
- ☐ A check is enclosed.
- ☒ Payment by credit card. **Via EFS Credit Card Process**
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature Date October 29, 2015
Typed or printed name Allen D Hertz Registration No. 50,942

Google Ex. 1029, p. 013

Electronic Patent Application Fee Transmittal

Application Number:	14285273
Filing Date:	22-May-2014
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Filer:	Allen D. Hertz
Attorney Docket Number:	MEN-14-002

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**480**

Electronic Acknowledgement Receipt

EFS ID:	23936787
Application Number:	14285273
International Application Number:	
Confirmation Number:	9122
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Customer Number:	31877
Filer:	Allen D. Hertz
Filer Authorized By:	
Attorney Docket Number:	MEN-14-002
Receipt Date:	29-OCT-2015
Filing Date:	22-MAY-2014
Time Stamp:	18:38:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$480
RAM confirmation Number	5595
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	MEN-14-002_Mendelson_Mapping_Issue_Fee_Submission_102915.pdf	356920 c4aeb2ac30dab2dc471cec37b1ceb746e9932e24	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30338 50a1331fb440065293a2d23a57b3030b5c066b0f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	387258		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

31877 7590 10/20/2015

ALLEN D. HERTZ
ALLEN D HERTZ, P.A.
12784 TULIPWOOD CIRCLE
BOCA RATON, FL 33428

EXAMINER
LY, NGHI H

ART UNIT	PAPER NUMBER
2642	

DATE MAILED: 10/20/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/285,273	05/22/2014	Ehud Mendelson	MEN-14-002	9122

TITLE OF INVENTION: INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/20/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

Google Ex. 1029, p. 018

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

31877 7590 10/20/2015
ALLEN D. HERTZ
ALLEN D HERTZ, P.A.
12784 TULIPWOOD CIRCLE
BOCA RATON, FL 33428

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/285,273	05/22/2014	Ehud Mendelson	MEN-14-002	9122

TITLE OF INVENTION: INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/20/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
LY, NGHI H	2642	455-456100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/285,273	05/22/2014	Ehud Mendelson	MEN-14-002	9122

31877 7590 10/20/2015

ALLEN D. HERTZ
ALLEN D HERTZ, P.A.
12784 TULIPWOOD CIRCLE
BOCA RATON, FL 33428

EXAMINER	
LY, NGHI H	

ART UNIT	PAPER NUMBER
2642	

DATE MAILED: 10/20/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/285,273	Applicant(s) MENDELSON, EHUD	
	Examiner NGHI H. LY	Art Unit 2642	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *07/20/2015*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-36*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☒ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/NGHI H LY/
Primary Examiner, Art Unit 2642

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Allen D. Hertz on 10/14/2015.

The application (**claims 30 and 36**) has been amended as follows:

Claim 30 (New): The method according to claim 1, further comprising a step of:

employing said mobile device for providing communication with at least one of:

social networking, emergency~~,~~

chat,

exchange messaging,

stationary location to vehicle communication,

vehicle communication to stationary location communication, and

vehicle to vehicle communication.

Claim 36 (New): The method according to claim 12 further comprising a step of:

initiating direct contact between the mobile device and a remote contents provider, wherein said direct contact is provided by at least one of an Internet, a web site, and a cloud base program.

REASONS FOR ALLOWANCE

2. Claims 1-36 are allowed.

The following is an examiner's statement of reasons for allowance:

Claims 1-36 are allowable for the reasons as indicated in Applicant's remarks (dated 07/20/2015).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGHI H. LY whose telephone number is (571)272-7911. The examiner can normally be reached on 9:30am-8:00pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rafael Perez-Gutierrez can be reached on (571) 272-7915. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly
/NGHI H LY/
Primary Examiner, Art Unit 2642

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S238	453	((location$3 position$3 geograph$5) near3 (information data)) near12 (beacon near12 signal) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/13 17:01
S239	345	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/13 17:08
S243	9	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/13 17:56
S245	0	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 get$3) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/14 07:52
S246	0	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 get$3) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/14 07:53
S247	0	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 retriev$4 get$3) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/14 07:55
S248	0	((location$3 position$3 geograph$4 area zone region$4 place) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$4 area zone region$4 place) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 retriev$4 get$3) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/14 08:00

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S249	0	(h04w04/00.cpc. h04w4/02.cpc. h04l29/08657.cpc. 455/456.1.ccls. 455/404.2.ccls. 455/414.1.ccls. 455/456.3.ccls.) and ((location$3 position$3 geograph$4 area zone region$4 place) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$4 area zone region$4 place) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 retriev$4 get$3) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/14 08:10
S250	5	(h04w04/00.cpc. h04w4/02.cpc. h04l29/08657.cpc. 455/456.1.ccls. 455/404.2.ccls. 455/414.1.ccls. 455/456.3.ccls.) and ((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/14 08:11
S251	0	(Mendelson near3 Ehud) and ((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/14 08:11

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S240	276	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and @ad<"20050412"	US-PGPUB; USPAT	OR	ON	2015/10/13 17:24
S241	335	((location$3 position$3 geograph$5) near3 (information data)) near12 (beacon near12 signal) and @ad<"20050412"	US-PGPUB; USPAT	OR	ON	2015/10/13 17:24
S244	8	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and @ad<"20050412"	US-PGPUB; USPAT	OR	ON	2015/10/13 17:56
S252	0	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 get$3) and @ad<"20050412"	US-PGPUB; USPAT	OR	ON	2015/10/14 07:52
S253	0	((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 retriev$4 get$3) and @ad<"20050412"	US-PGPUB; USPAT	OR	ON	2015/10/14 07:55
S254	0	((location$3 position$3 geograph$4 area zone region$4 place) near12 (information data))	US-PGPUB;	OR	ON	2015/10/14 08:00

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		near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$4 area zone region$4 place) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 retriev$4 get$3) and @ad<"20050412"	USPAT			
S255	0	(h04w04/00.cpc. h04w4/02.cpc. h04l29/08657.cpc. 455/456.1.ccls. 455/404.2.ccls. 455/414.1.ccls. 455/456.3.ccls.) and ((location$3 position$3 geograph$4 area zone region$4 place) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$4 area zone region$4 place) near12 (information data)) near12 (beacon adj2 signal) near12 (obtain$3 retriev$4 get$3) and @ad<"20050412"	US-PGPUB; USPAT	OR	ON	2015/10/14 08:10
S256	5	(h04w04/00.cpc. h04w4/02.cpc. h04l29/08657.cpc. 455/456.1.ccls. 455/404.2.ccls. 455/414.1.ccls. 455/456.3.ccls.) and ((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and @ad<"20050412"	US-PGPUB; USPAT	OR	ON	2015/10/14 08:11
S257	0	(Mendelson near3 Ehud) and ((location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal) and (decod$3 near12 (location$3 position$3 geograph$5) near12 (information data)) near12 (beacon adj2 signal)	US-PGPUB; USPAT	OR	ON	2015/10/14 08:11

10/ 15/ 2015 6:10:23 AM
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14285273	MENDELSON, EHUD
	Examiner	Art Unit
	NGHI H LY	2642

CPC- SEARCHED		
Symbol	Date	Examiner
H04W 04/00, H04W 4/02, H04L29/08657	10/13/2015	nly

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
See search history.	10/13/2015	nly

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
455	456.1,404.2,414.1,456.3	10/13/2015	nly

SEARCH NOTES		
Search Notes	Date	Examiner
See search history.	10/13/2015	nly

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
455	456.1,404.2,414.1,456.3	10/13/2015	nly

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14285273	MENDELSON, EHUD
	Examiner	**Art Unit**
	NGHI H LY	2642

CPC						
Symbol					**Type**	**Version**
H04W		4	/	025	F	2013-01-01
G06Q		30	/	0261	I	2013-01-01
G01S		5	/	04	I	2013-01-01
H04W		64	/	006	I	2013-01-01
H04W		88	/	02	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 36	
/NGHI H LY/ Primary Examiner.Art Unit 2642 (Primary Examiner)	10/15/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 11

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14285273	MENDELSON, EHUD
	Examiner	**Art Unit**
	NGHI H LY	2642

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
455	456.1	H	0	4	W	24 / 00 (2009.01.01)						

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
455	404.2	414.1	456.3		

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	36	
/NGHI H LY/ Primary Examiner.Art Unit 2642	10/15/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	11

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14285273	MENDELSON, EHUD
	Examiner	**Art Unit**
	NGHI H LY	2642

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	32	17	27	33										
2	2	33	18	28	34										
3	3	34	19	13	35										
4	4	35	20	14	36										
5	5	36	21												
6	6	16	22												
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12	12	22	28												
15	13	23	29												
29	14	24	30												
30	15	25	31												
31	16	26	32												

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 36	
/NGHI H LY/ Primary Examiner.Art Unit 2642 (Primary Examiner)	10/15/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 11

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14285273	MENDELSON, EHUD
	Examiner	**Art Unit**
	NGHI H LY	2642

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/18/2015	10/15/2015							
1	1	✓	=							
2	2	✓	=							
3	3	✓	=							
4	4	✓	=							
5	5	✓	=							
6	6	✓	=							
7	7	✓	=							
8	8	O	=							
9	9	✓	=							
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27	33		=							
28	34		=							
13	35		=							
14	36		=							

Doc Code: DIST.E.FILE **Document Description: Electronic Terminal Disclaimer - Filed**	PTO/SB/25 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION**
Application Number	14285273
Filing Date	22-May-2014
First Named Inventor	Ehud Mendelson
Attorney Docket Number	MEN-14-002
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
GAMBA GROUP LIMITED	100%

The owner(s) of percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending reference Application Number(s)

14285209 filed on 05/22/2014

as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the reference application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said reference application, "as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application," in the event that any such patent granted on the pending reference application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

○	I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

◉ Small Entity

○ Micro Entity

○ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 50942

○ A sole inventor

○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application

○ A joint inventor; all of whom are signing this request

Signature	/Allen D Hertz/
Name	Allen D. Hertz

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	14285273
Filing Date:	22-May-2014
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Filer:	Allen D. Hertz
Attorney Docket Number:	MEN-14-002

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Statutory or Terminal Disclaimer	1814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**160**

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 14285273

Filing Date: 22-May-2014

Applicant/Patent under Reexamination: Mendelson et al.

Electronic Terminal Disclaimer filed on October 14, 2015

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	23781773
Application Number:	14285273
International Application Number:	
Confirmation Number:	9122
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Customer Number:	31877
Filer:	Allen D. Hertz
Filer Authorized By:	
Attorney Docket Number:	MEN-14-002
Receipt Date:	14-OCT-2015
Filing Date:	22-MAY-2014
Time Stamp:	14:53:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$160
RAM confirmation Number	1128
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Electronic Terminal Disclaimer-Filed	eTerminal-Disclaimer.pdf	34030 f80b5fd7cc1e22120f402895cab250062ed9a54c	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30339 410751d76aa51a633de441d9498e9d4c06f59fc3	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	64369		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

In The United States Patent and Trademark Office

Application No.	: 14/285,273	Confirmation No. 9122
Applicant	: Ehud MENDELSON	
Title	: **INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS**	
Filed	: May 22, 2014	
TC/A.U.	: 2642	
Examiner	: Nghi H. LY	Tel: (571) 272-7911
Docket No.	: MEN-14-002	
Customer No.	: 31877	

Mail Stop: Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Response to Non-Final Office Action Dated March 20, 2015

Amendment Revised Under 37 C.F.R. § 1.121(b)

Sir:

Please enter the following amendment and comments into the file of the above-identified patent application, in response to the Non-Final Office Action dated March 20, 2015. The Examiner has established a shortened FOUR (4) MONTH statutory period to respond to the Non-Final Office Action. Applicant is submitting the response on or before Monday, July 20, 2015, the actual FOUR (4) MONTH anniversary of the subject Office Action. Therefore, Applicant believes the response requires a Petition for a ONE (1) MONTH extension and the required petition fee of $100 (Small Entity), both are being submitted herewith.

Amendments to the Specification are reflected on page 03 of this paper.

Amendments to the Claims are reflected in the listing of claims, which begins on page 06 of this paper, with an amended version of the current claims beginning on page 07 of this paper.

Google Ex. 1029, p. 041

Remarks/Arguments begin on page 21 of this paper.

Conclusions begin on page 72 of this paper.

Google Ex. 1029, p. 042

Amendments to the Specification:

Please amend the specification submitted herewith as follows:

1) Please amend Paragraph [00126], which starts with "The beacons ID can trigger a link to exiting software...." as follows:

"[00126] The beacons ID can trigger a link to ~~exiting~~ existing software and aware the local system of the user existence – such as:

A traveler is check in into a hotel/resort, the hotel/resort can provides with automatic check-in and interface to the hotel/resort front system.

A traveler is check-in into a flight in the airport, the airline provides the traveler with automatic check in to the flight when the traveler reach close proximity to a RF local beacon.

A customer are check into a restaurant or food service, the business will recognize the customer when he in proximity to the local RF beacon.

The pedestrian reach an advertising area or billboard that can recognize the user by being in a close proximity to the advertising area and provide the user with customize personalize advertising or offer.

A customer is entering a store/bank/facility front would be identified/recognized for additional information or services.

The RF beacons/tags can serve to track employee time, including check-in and checkout times from designate area.

~~The RF beacons/tags can serve as part of payment process where the user mobile and the local proximity beacons/tags can provide additional security for a mobile payment system to replace a current payment method such as those using credit cards.~~

The local RF beacons associate with the user mobile can be part of local dating

Google Ex. 1029, p. 043

system.

The local RF beacons with associate with the user mobile can create virtual secure zone for child or elderly or any care monitoring.

The location of the user as associate with the local beacons can be interface with social networking.

The RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking.

The RF beacon can be installed or be a part of a vehicle to provide car application like payments security car broadcasting car tracking car communication and automatic car counting to provide transportation managements with statistically information automatically.

2) Please delete Paragraph [00239], which starts with "The RF beacons/tags can serve as part of a payment process...." as follows:

"~~[00239] The RF beacons/tags can serve as part of a payment process, where the user's cellular phone and the local proximity beacons/tags can provide additional security for a mobile payment process, which can be used to replace other current payment methods, such as credit cards.~~"

3) Please delete Paragraph [00570], which starts with "The arrival notice may be configured to trigger-...." as follows:

"~~[00570] The arrival notice may be configured to trigger payment for merchandise or a service.~~"

Google Ex. 1029, p. 044

An Annotated Specification is submitted herewith and identified in the top margin accordingly.

A Substitute Specification is submitted herewith and identified in the top margin accordingly.

Google Ex. 1029, p. 045

IN THE CLAIMS

Claims 1-36 are currently pending in the application.

Please amend **Claims 1, 3, 8, 10, 11, 14, and 20**.

Please add **Claims 22-36**.

No claims are canceled.

No claims are withdrawn.

An amended version of the pending claims starts on page 07 in accordance with 37 CFR § 1.121(c)(3) as follows: The status of each Claim is indicated adjacent the Claim Number in accordance with the proper status identifiers: (Original), (Currently Amended), (Canceled), (Previously Presented), (New), (Not Entered), (Withdrawn), and (Withdrawn-Currently Amended) in accordance with 37 CFR § 1.121. Any changes to the claims are shown by strikethrough or within double brackets (for deleted matter) and underlining (for added matter, excluding New Claims).

Thereafter, starting on a separate page, (Page 21), is the Remarks portion in accordance with 37 CFR § 1.111.

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (Currently Amended) A method of mapping a localized area comprising an interior of at least one enclosed structure, the method comprising steps of:

deploying a series of beacons about said localized area comprising at least one enclosed structure, wherein at least a portion of said series of beacons are located to transmit within an interior of said at least one enclosed structure;

broadcasting a beacon signal from each beacon of said series of beacons, wherein each said beacon signal includes information associated with a known physical location of said respective beacon;

determining a location of a mobile device in accordance with following steps:

scanning for any of said beacon signals using a mobile device,

detecting at least one of said broadcast beacon signals,

receiving at least one of said beacon signal by said mobile device, wherein said beacon signal is broadcast from a beacon of said series of beacons located proximate said mobile device,

decoding said beacon signal to obtain said included known respective beacon physical location information, and

determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location

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information decoded ~~collected~~ from said received beacon signal;

determining an indoor map associated with said localized area;

displaying said localized area indoor map; and

displaying said current location of said mobile device on said localized area indoor map.

Claim 2. (Original) The method as recited in claim 1, where the beacon signal is a short range radio frequency being at least one of a Bluetooth signal and a Wi-Fi signal, the method further comprising a step of:

transmitting said beacon signal as at least one of said Bluetooth signal and said Wi-Fi signal.

Claim 3. (Currently Amended) The method as recited in claim 1, further comprising steps of:

utilizing beacon signals from said series of beacons to aid in navigation to said mobile device, when said mobile device is located within an interior of a structure where a global positioning system (GPS) is at least one of insufficiently accurate and ineffective.

Claim 4. (Original) The method as recited in claim 1, wherein said step of determining said current location of said mobile device is accomplished by utilizing a signal strength of said received beacon signal.

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Claim 5. (Original) The method as recited in claim 1, wherein said step of determining said current location of said mobile device is accomplished by utilizing triangulation and at least two received beacon signals from at least two beacons.

Claim 6. (Original) The method as recited in claim 1, wherein said localized area indoor map is a floor plan image of said localized area.

Claim 7. (Original) The method as recited in claim 1, wherein said localized area indoor map is an indoor image of said localized area.

Claim 8. (Currently Amended) ~~The method as recited in claim 1, further comprising steps of:~~

A method of mapping a localized area comprising an interior of at least one enclosed structure, the method comprising steps of:

deploying a series of beacons about said localized area comprising at least one enclosed structure, wherein at least a portion of said series of beacons are located to transmit within an interior of said at least one enclosed structure;

broadcasting a beacon signal from each beacon of said series of beacons;

determining a location of a mobile device in accordance with following steps:

scanning for any of said beacon signals using a mobile device,

detecting at least one of said broadcast beacon signals,

receiving at least one of said beacon signal by said mobile device, wherein said beacon signal is broadcast from a beacon of said series of beacons located proximate said

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mobile device, and

determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon information collected from said received beacon signal;

determining an indoor map associated with said localized area;

displaying said localized area indoor map;

displaying said current location of said mobile device on said localized area indoor map;

traveling from said current location towards a subsequent location;

repeating said steps of determining a location of a mobile device to determine said subsequent location;

determining a path between said current location and said subsequent location; and

associating said current location and said subsequent location.

Claim 9. (Original) The method as recited in claim 1, further comprising a step of:

overlaying a series a gradient concentric circles onto said localized area indoor map, wherein said series a gradient concentric circles provide a distance relationship between said mobile device and a secondary object.

Claim 10. (Currently Amended) The method as recited in claim 1, further comprising a step of:

displaying each point of interest (~~POA~~ POI) associated a beacon identifier determined

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from said beacon signal on at least one of said mobile device and said localized area indoor map on a display of said mobile device.

Claim 11. (Currently Amended) The method as recited in claim 1, further comprising steps of:

displaying each point of interest (~~POA~~ POI) associated a beacon identifier determined from said beacon signal on said localized area indoor map;

selecting a beacon location from each displayed beacon location on said localized area indoor map;

obtaining information associated with each said point of interest (~~POA~~ POI); and

displaying said local based services (LBS) information associated with each said point of interest (~~POA~~ POI) on said mobile device.

Claim 12. (Original) The method as recited in claim 1, further comprising steps of:

customizing each beacon signal by embedding a beacon identifier within said beacon signal, wherein said beacon identifier distinguishes said beacon from said series of beacons;

broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons;

scanning for any of said beacon signals using a mobile device;

detecting at least one of said broadcast beacon signals;

receiving at least one of said beacon signal by said mobile device

decoding said received beacon signal to determine said beacon identifier;

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initiating a process for obtaining marketing information associated with said beacon identifier from a remote information provider;

transmitting a request for marketing information associated with said beacon identifier from said remote information provider;

obtaining said marketing information associated with said beacon identifier from said remote information provider; and

displaying said obtained marketing information associated with said beacon identifier on said mobile device.

Claim 13. (Original) The method as recited in claim 1, further comprising steps of:

determining a floor of said at least one enclosed structure on which said beacon signal is associated with;

identifying an associated floor map portion of a series of floor map portions of said localized area indoor map, wherein said associated floor map portion represents said floor associated with said beacon signal;

displaying said associated floor map portion of said localized area indoor map; and

displaying said current location of said mobile device on said associated floor map portion of said localized area indoor map.

Claim 14. (Currently Amended) A method of mapping a localized area comprising an interior of at least one enclosed structure, the method comprising steps of:

deploying a series of beacons about said localized area comprising at least one enclosed

Google Ex. 1029, p. 052

structure, wherein at least a portion of said series of beacons are located to transmit within an interior of said at least one enclosed structure;

customizing each beacon signal by embedding a beacon identifier within a beacon signal, wherein said beacon identifier distinguishes said beacon from said series of beacons;

broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons, wherein each said respective beacon signal includes information identifying a unique physical location of each respective beacon, wherein said identification information is associated with a known physical location of said respective beacon;

scanning for any of said beacon signals using a mobile device;

detecting at least one of said broadcast beacon signals;

receiving at least one of said beacon signal by said mobile device;

decoding said received beacon signal to obtain at least one of said beacon identifier and said included known respective beacon physical location information;

initiating a process for providing marketing information associated with said beacon identifier to said mobile device;

obtaining at least one of local based services program and said marketing information associated with said ~~beacon identifier~~ at least one of said beacon identifier and said included known respective beacon physical location information; and

displaying said obtained at least one of local based services program and said marketing information on said mobile device.

Google Ex. 1029, p. 053

Claim 15. (Original) The method as recited in claim 14, where the beacon signal is a short range radio frequency being at least one of a Bluetooth signal and a Wi-Fi signal, the method further comprising a step of:

transmitting said beacon signal as at least one of said Bluetooth signal and said Wi-Fi signal.

Claim 16. (Original) The method as recited in claim 14, further comprising steps of:

determining a location of said mobile device respective to said beacon associated with said received beacon signal; and

displaying said location of said mobile device respective to said beacon associated with said received beacon signal on said mobile device.

Claim 17. (Original) The method as recited in claim 14, further comprising steps of:

determining a location of said mobile device respective to said beacon associated with said received beacon signal, wherein location is determined using at least one of:

signal strength of said beacon signal,

triangulation using two or more beacon signals, and

location information embedded within said beacon signal; and

displaying said location of said mobile device respective to said beacon associated with said received beacon signal on said mobile device.

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Claim 18. (Original) The method as recited in claim 14, further comprising steps of:

determining a location of said mobile device respective to said beacon associated with said received beacon signal;

obtaining a localized area map associated with said location of said beacon;

determining a location of each of said mobile device and said beacon on said localized area map;

displaying said location of said mobile device respective to said beacon identifier overlaid upon said localized area map on said mobile device.

Claim 19. (Original) The method as recited in claim 14, wherein said beacon associated with said received beacon signal is located within an enclosed structure, the method further comprising steps of:

determining a location of said mobile device respective to said beacon associated with said received beacon signal;

obtaining a localized area indoor map associated with said location of said beacon;

determining a location of each of said mobile device and said beacon on said localized area indoor map;

displaying said location of said mobile device respective to said beacon associated with said received beacon signal overlaid upon said localized area map on said mobile device.

Claim 20. (Currently Amended) The method as recited in claim 14, further comprising a step of:

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utilizing beacon signals from said series of beacons to aid in navigation to said mobile device, when said mobile device is located within an interior of a structure where a global positioning system (GPS) is at least one of insufficiently accurate and ineffective.

Claim 21. (Original) The method as recited in claim 14, further comprising a step of:

transmitting an arrival notification signal upon arrival proximate to one beacon of said series of beacons to notify at least one other party of arrival at said one beacon.

Claim 22. (New) The method as recited in claim 1, further comprising a step of:

providing navigation to said user upon an emergency condition.

Claim 23. (New) The method as recited in claim 1, further comprising a step of:

providing navigation to assist said user in exiting said structure upon an emergency condition.

Claim 24. (New) The method as recited in claim 23, further comprising a step of:

communicating with an E-911 network.

Claim 25. (New) The method as recited in claim 1, further comprising a step of:

initiating at least one location based service (LBS), wherein the location based service

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(LBS) is associated with said current location of said mobile device.

Claim 26. (New) The method as recited in claim 1, further comprising a step of:

initiating a direct link to a website.

Claim 27. (New) The method as recited in claim 1, further comprising a step of:

providing assistance to a wireless payment process using said mobile device.

Claim 28. (New) The method as recited in claim 1, further comprising a step of:

displaying said current user location depicted within a circle on a display of said mobile device.

Claim 29. (New) The method as recited in claim 1, further comprising a step of:

displaying the user location in the immediate area depicted within a circle having a radius representing an accuracy of said current user location of said mobile device.

Claim 30 (New): The method according to claim 1, further comprising a step of:

employing said mobile device for providing communication with at least one of:

social networking,

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emergency.

chat,

exchange messaging,

stationary location to vehicle communication,

vehicle communication to stationary location communication, and

vehicle to vehicle communication.

Claim 31 (New): The method according to claim 1, wherein said mobile device is a first mobile device, further comprising at least two more mobile devices, wherein each at least two more mobile devices is in operation like said first mobile device,

wherein each of said first mobile device and said at least one more mobile device is adapted to change from a first communicate link with one mobile device to a second communication link with any other different mobile device of the at least two more mobile devices.

Claim 32 (New): The method according to claim 1, wherein said mobile device is a first mobile device, further comprising at least one more mobile device, wherein each at least one more mobile device is in operation like said first mobile device,

wherein said first mobile device and said at least one more mobile device are adapted to communicate with one another forming a social network.

Claim 33 (New): The method according to claim 1, wherein one beacon of said plurality of

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beacons is adapted to communicate with other beacons of said plurality of beacons forming a social network, wherein said social network is established and supported by sharing beacon identifiers.

Claim 34 (New): The method according to claim 1, wherein said series of beacons is adapted to support at least one of:

marketing,

social networking,

a dating service,

vehicle to vehicle communication,

emergency,

locating an individual in one of an emergency condition or a disaster condition,

messaging associated with an emergency,

navigation to direct a user out of a structure during an emergency condition, and

operating within a mass transportation system.

Claim 35 (New): The method according to claim 12 further comprising a step of:

changing the beacon identifier frequently and dynamically, where the step of changing the beacon identifier frequently and dynamically is accomplished by the user.

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Claim 36 (New): The method according to claim 12 further comprising a step of:

initiating direct contact between the mobile device and a remote contents, wherein said direct contact is provided by at least one of an Internet, a web site, and a cloud base program.

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REMARKS

Claims 1-36 are currently pending in the application.

Claims 1, 3, 8, 10, 11, 14, and 20 have been amended herein without prejudice.

Claims 22-36 have been added.

No claims are withdrawn.

No claims are canceled.

Status of Application in Accordance with the American Inventor's Act

The present application is being examined under the pre-AIA first to invent provisions.

Request for Examiner's Interview

Applicant respectfully requests an interview with the Examiner to discuss the response. Applicant earnestly believes that an interview with the Examiner would result in expediting the case to an allowance. The Examiner has already indicated allowable subject matter. Applicant desires to discuss the amendments to the rejected claims to determine allowability thereof. Once the Examiner has considered the effect of the response, a telephone call to the undersigned at (561) 716-3915 is respectfully requested. Applicant respectfully notes that, in accordance with MPEP 713.01 and 37 CFR 1.133, "[w]here the reply to a first complete action includes a request for an interview, a telephone consultation to be initiated by the examiner or a video conference…, the examiner, as soon as he or she has considered the effect of the reply, should grant such request if it appears that the interview or consultation would result in expediting the case to allowance."

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DETAILED ACTION

Claim Objections

1. The Examiner objected to **Claim 14** because of the following informalities:

1A. (Examiner's Position): A comma (,) should be added as follow: "receiving at least one of the beacon signal by the mobile device, decoding the *received* beacon signal,"

Appropriate correction is required.

1a. (Applicant's Remarks): Claim 14 is an Independent claim.

Applicant has amended Independent **Claim 14** to more clearly and concisely define the present invention as follows:

"receiving at least one of said beacon signal by said mobile device**;**

decoding said received beacon signal;"

Applicant earnestly believes the objection to Independent **Claim 14** because informalities has been overcome by an amendment and remarks submitted herein. Applicant respectfully requests the Examiner reconsider and withdraw the objection to Independent **Claim 14** because informalities.

Claim Rejections - **35** *USC* **§** *103*

2. In the *event* the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

3. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all

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obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham v. John Deere Co.,* 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or non obviousness.

4a. (Applicant's Remarks): Applicant respectfully notes, this is a first Office Action, therefore, the Statement of "The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action" is premature.

5. The Examiner rejected **Claims 1-4** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A).

5A. (Examiner's Position): Regarding **Claim 1**, Simons teaches a method of mapping a localized area comprising an interior of at least one enclosed structure, the method comprising steps of: deploying a series of beacons about the localized area comprising at least one enclosed structure (Abstract, "beacons 30, 32, 33", and [0016], "several beacons located a few meters apart", also see [0002], [0016], [0020], [0041] and [0051], see *"shopping mall", "airport': "shop"*

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restaurant", "hotel", "internet cafe, museums and other places of public interest and commerce", and see [0012] and [0013], *"wall'),* wherein at least a portion of the series of beacons are located to transmit within an interior of the at least one enclosed structure (Abstract, "beacons 30, 32, 33", and [0016], "several beacons located a few meters apart", also see [0002], [0016], [0020], [0041] and [0051], see" *shopping mall", "airport", "shop", "restaurant", "hotel", "internet cafe, museums and other places of public interest and commerce",* and see [0012] and [0013], *"wall'),* broadcasting a beacon signal from each beacon of the series of beacons (see Abstract, [0005] to [0018], "beacons" and "broadcast"), determining a location of a mobile device in accordance with following steps: scanning for any of the beacon signals using a mobile device, detecting at least one of the broadcast beacon signals (see Abstract, [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "position", "zone", "range", "broadcast"), receiving at least one of the beacon signal by the mobile device (see Abstract, [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "broadcast"), wherein the beacon signal is broadcast from a beacon of the series of beacons located proximate the mobile device (see Abstract, [0006], [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "beacon, "position", "zone", "range", "broadcast", "proximity"), and determining a current location of the mobile device within the interior of an enclosed structure of the at least one enclosed structure (see Abstract, [0006], [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "beacon, "position", "zone", "range", "broadcast", "proximity", and see fig.1, **range** 12, [0034], see *"the CA terminal* 14 *is just within the broadcast* ***range*** 12, *and therefore the user may receive unsolicited or pushed* ***service offers, adverts*** *and* ***the like*** *on their CA terminal* 14 *from the beacon* 10", also see [0002], [0016], [0020], [0041] and [0051], see *"shopping mall", "airport': "shop" restaurant", "hotel", "internet cafs, museums and other places of public interest and commerce"),* wherein the current location of the mobile device is determined based upon information collected from the received beacon signal (see Abstract, [0006], [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "beacon, "position", "zone", "range", "broadcast", "proximity", and see fig.1, **range** 12, [0034], see *"the CA terminal* 14 *is just within the broadcast* ***range*** 12, *and therefore the user may receive unsolicited or pushed* ***service offers. adverts*** *and* ***the like*** *on their CA terminal* 14 *from the beacon 10",* also see [0002], [0016], [0020], [0041] and [0051], see"

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shopping mail", "airport': "shop" restaurant", "hotel", "internet cafs, museums and other places of public interest and commerce"), determining an indoor map associated with the localized area (see [0041], "shopping mall. .. provide ... map"), displaying the localized area indoor map (see [0041], "shopping mall. .. provide ... map").

Simons does not specifically disclose displaying the current location of the mobile device on the localized area indoor map.

Yamazaki teaches displaying the current location of the mobile device on the localized area indoor map (see Basic-Abstract, *"User terminal receives this information based on which the current position of user and route to destination are displayed on indoor map").*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Yamazaki into the system of Simons in order to make the reaching of the destination easier without fear of moving in a wrong path (also see Yamazaki, Basic-Abstract).

5a. (Applicant's Remarks): Claim 1 is an Independent claim.

Applicant has amended Independent **Claim 1** to more clearly and concisely define the present invention as follows:

"deploying a series of beacons about said localized area comprising at least one enclosed structure, wherein at least a portion of said series of beacons are located to transmit within an interior of said at least one enclosed structure;

broadcasting a beacon signal from each beacon of said series of beacons, wherein each said beacon signal includes information associated with a known physical location of said respective beacon;

determining a location of a mobile device in accordance with following steps:

scanning for any of said beacon signals using a mobile device,

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detecting at least one of said broadcast beacon signals,

receiving at least one of said beacon signal by said mobile device, wherein said beacon signal is broadcast from a beacon of said series of beacons located proximate said mobile device,

decoding said beacon signal to obtain said included known respective beacon physical location information, and

determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded ~~collected~~ from said received beacon signal;

determining an indoor map associated with said localized area;

displaying said localized area indoor map; and

displaying said current location of said mobile device on said localized area indoor map."

The Examiner rejected Independent **Claim 1** under pre-AIA 35 U.S.C. 102(e) as being anticipated by Simons.

Simons fails to teach an inclusion of the limitations of:

"*decoding said beacon signal to obtain said included known respective beacon physical location information, and*

determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded from said received beacon signal;"

Simons utilizing a proximity to the beacon to push information from the beacon to the

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user. This adaptation does not require any encoding and transmission of geographic location information from the beacon to the mobile device.

Regarding Yamazaki: Yamazaki's contribution is limited to "Yamazaki teaches displaying the current location of the mobile device on the localized area indoor map (see Basic-Abstract, *"User terminal receives this information based on which the current position of user and route to destination are displayed on indoor map").*"

Consequently, Yamazaki's contribution fails to teach the limitation as recited above.

Applicant earnestly believes the rejection of Independent **Claim 1** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted herein. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Independent **Claim 1** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki.

5B. (Examiner's Position): Regarding **Claim 2**, Simons teaches the beacon signal is a short range radio frequency being at least one of a Bluetooth signal and a Wi-Fi signal, the method further comprising a step of: transmitting the beacon signal as at least one of the Bluetooth signal and the Wi-Fi signal (see [0033], [0038], [0046], [0047] and [0048], *"Bluetooth", "IEEE").*

5b. (Applicant's Remarks): Dependent **Claim 2** depends from Independent **Claim 1**.

Applicant respectfully directs the Examiner to the summary presented in section 5e below.

5C. (Examiner's Position): Regarding **Claim 3**, Simons teaches utilizing beacon signals from the series of beacons to aid in navigation to the mobile *device,* when the mobile *device* is located within an interior of a structure where a global positioning system (GPS) is ineffective (see

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[0002]. [0016]. [0020], [0041] and [0051], see *"shopping mail", "airport", "shop" restaurant", "hotel", "internet cafs, museums and other places of public interest and commerce".* In addition, see the teaching of Wrappe, [0044] and [0046], in claim 20 below, *"where GPS signal blockage severely degrades").*

5c. (Applicant's Remarks): Dependent **Claim 3** depends from Independent **Claim 1**.

Applicant respectfully directs the Examiner to the summary presented in section 5e below.

5D. (Examiner's Position): Regarding **Claim 4**, Simons teaches the step of determining the current location of the mobile *device* is accomplished by utilizing a signal strength of the *received* beacon signal (see fig.1 , range 12, and see [0009], *"range dependent upon the power of the beacon".* In this case, if the power of the beacon is strong, a geographic location proximate the beacon is closer, on the other hand, if the power of the beacon is weak, a geographic location proximate the beacon is faraway. **In addition, see Claims 5 and 17 below, where Gwon teaches *"determining the current location of the mobile device is accomplished by utilizing* a *signal strength of* *the received* *beacon* *signal).***

5d. (Applicant's Remarks): Dependent **Claim 4** depends from Independent **Claim 1**.

Regarding the Examiner's comment of "**see Claims 5 and 17 below, where Gwon teaches *"determining the current location of the mobile device is accomplished by utilizing* a *signal strength of* *the received* *beacon* *signal)"***, Applicant respectfully notes, Independent **Claim 1** has been amended to more clearly and concisely define the present invention as including the following:

> "*decoding said beacon signal to obtain said included known respective beacon physical location information, and*

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determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded from said received beacon signal;"

Applicant is utilizing the information encoded within the beacon signal to determine the location, which is distinctly different than using the signal strength to determine the location of the device.

Applicant respectfully directs the Examiner to the summary presented in section 5e below.

5e. (Applicant's Summary): Applicant earnestly believes the rejection of Independent **Claim 1** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to their dependency from Independent **Claim 1**; Dependent **Claims 2-4** are also nonobvious over Simons in view of Yamazaki. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claims 2-4** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki.

6. The Examiner rejected **Claim 5** under pre-AIA 35 U.S.C. 103(a) as being unpatentable *over* Simons (US 2003/0045280 A1) in view of Yamazaki (JP 09126804 A) and further in *view* of Gwon (US 2002/0131386 A1).

6A. (Examiner's Position): Regarding **Claim 5**, the combination of Simons and Yamazaki teaches **Claim 1**. The combination of Simons and Yamazaki does not specifically disclose the step of determining the current location of the mobile *device* is accomplished by utilizing triangulation and at least two received beacon signals from at least two beacons.

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Gwon teaches the step of determining the current location of the mobile device is accomplished by utilizing triangulation and at least two received beacon signals from at least two beacons (see [0076], *"If a number of BTS cells are present such that the mobile node is receiving beacon signal**s**, from at least three BTS', conventional triangulation techniques based on relative beacon signal **strength** measurements can be used to determine the mobile node's distance from each BTS. Another way is to use GPS').*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Gwon into the system of Simons and Yamazaki in order to enable fast route pre-establishment and reduced packet latency, and for optimizing quality of *service* by facilitating selection of best base station transceiver in overlapping cell environments, among other applications (see Gwon, Abstract)

6a. (Applicant's Remarks): Dependent **Claim 5** depends from Independent **Claim 1**.

The Examiner relies upon Gwon for the introduction of triangulation to determine a location.

Gwon fails to teach a system having a limitation of:

> "*decoding said beacon signal to obtain said included known respective beacon physical location information, and*
>
> ***determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded from said received beacon signal;***"

Therefore, Applicant earnestly believes the limitations introduced and presented in section 5a above additionally overcome an introduction of Gwon.

Applicant earnestly believes the rejection of Independent **Claim 1** under pre-AIA 35

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U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to its dependency from Independent **Claim 1**; Dependent **Claim 5** is also nonobvious over Simons in view of Yamazaki and further in *view* of Gwon. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claim 5** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki and further in *view* of Gwon.

7. The Examiner rejected **Claim 6** is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280 A1) in view of Yamazaki (JP 09126804 A) and further in view of Carter (US 2002/0129138 A1).

7A. (Examiner's Position): Regarding **Claim 6**, the combination of Simons and Yamazaki teaches **Claim 1**. The combination of Simons and Yamazaki does not specifically disclose the localized area indoor map is a floor plan image of the localized area.

Carter teaches the localized area indoor map is a floor plan image of the localized area (see [0009], [0010], [0011] and [0032]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Carter into the system of Simons and Yamazaki in order to allow relative data points to be collected (also see Carter, [0032]).

7a. (Applicant's Remarks): Dependent **Claim 6** depends from Independent **Claim 1**.

The Examiner relies upon Carter for the introduction of a localized area indoor map is a floor plan image of the localized areas.

Carter fails to teach a system having a limitation of:

> "*decoding said beacon signal to obtain said included known respective beacon physical location information, and*

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determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded from said received beacon signal;"

Therefore, Applicant earnestly believes the limitations introduced and presented in section 5a above additionally overcome an introduction of Carter.

Applicant earnestly believes the rejection of Independent **Claim 1** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to its dependency from Independent **Claim 1**; Dependent **Claim 6** is also nonobvious over Simons in view of Yamazaki and further in *view* of Carter. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claim 6** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki and further in *view* of Carter.

8. The Examiner rejected **Claim 7** is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Yasukawa et al (US 2004/0066917 A1).

8A. (Examiner's Position): Regarding **Claim 7**, the combination of Simons and Yamazaki teaches **Claim 1**.

The combination of Simons and Yamazaki does not specifically disclose the localized area indoor map is an indoor image of the localized area.

Yasukawa the localized area indoor map is an indoor image of the localized area (see [0043], " ... *map information including images taken from various angles* of *the inside of the house").*

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Yasukawa into the system of Simons and Yamazaki in order to provide a robot suitable for reporting emergencies (see Yasukawa, [0010]).

8a. (Applicant's Remarks): Dependent **Claim 7** depends from Independent **Claim 1**.

The Examiner relies upon Yasukawa et al. for the introduction of a localized area indoor map is an indoor image of the localized area.

Yasukawa et al. fails to teach a system having a limitation of:

"*decoding said beacon signal to obtain said included known respective beacon physical location information, and*

determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded from said received beacon signal;"

Therefore, Applicant earnestly believes the limitations introduced and presented in section 5a above additionally overcome an introduction of Yasukawa et al..

Applicant earnestly believes the rejection of Independent **Claim 1** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to its dependency from Independent **Claim 1**; Dependent **Claim 7** is also nonobvious over Simons in view of Yamazaki and further in *view* of Yasukawa et al. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claim 7** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki and further in *view* of Yasukawa et al.

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9. The Examiner rejected **Claim 9** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280 A1) in view of Yamazaki (JP 09126804 A) and further in view of Maeda et al (US 7,743,337).

9A. (Examiner's Position): Regarding **Claim 9**, the combination of Simons and Yamazaki teaches indoor map (see Simons, [0041]). The combination of Simons and Yamazaki does not specifically disclose overlaying a series a gradient concentric circles onto the localized area indoor map, wherein the series a gradient concentric circles provide a distance relationship between the mobile device and a secondary object.

Maeda teaches overlaying a series a gradient concentric circles onto the localized area indoor map, wherein the series a gradient concentric circles provide a distance relationship between the mobile device and a secondary object (see fig.2B, 3, 4 and 5, and see column 3, lines 7-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Maeda into the system of Simons and Yamazaki, as a result, it is possible to know an approximate geographical distance to a destination intuitively and easily in the electronic map apparatus which is typically used for car navigation (see Maeda, Abstract).

9a. (Applicant's Remarks): Dependent **Claim 9** depends from Independent **Claim 1**.

The Examiner relies upon Maeda et al. for the introduction of an overlaying a series a gradient concentric circles onto the localized area indoor map, wherein the series a gradient concentric circles provide a distance relationship between the mobile device and a secondary object.

Maeda et al. fails to teach a system having a limitation of:

> "*decoding said beacon signal to obtain said included known respective beacon physical location information, and*

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determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded from said received beacon signal;"

Therefore, Applicant earnestly believes the limitations introduced and presented in section 5a above additionally overcome an introduction of Maeda et al.

Applicant earnestly believes the rejection of Independent **Claim 1** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to its dependency from Independent **Claim 1**; Dependent **Claim 9** is also nonobvious over Simons in view of Yamazaki and further in *view* of Maeda et al. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claim 9** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki and further in *view* of Maeda et al.

10. The Examiner rejected **Claims 10 and 11** are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US *2003/0045280A1)* in view of Yamazaki (JP 09126804 A) and further in view of Wrappe (US 2008/0280624).

10A. (Examiner's Position): Regarding **Claim 10**, the combination of Simons and Yamazaki teaches indoor map (see Simons, [0041], " *... may be used in places like shopping malls to provide location-specific information such as* ***local maps.*** *information on nearby* ***shops and restaurants*** *and so on, with a beacon downloading information keys to a mobile device",* and/or see Yamazaki, Basic-Abstract, *"User terminal receives this information based on which the current position of user and route to destination are displayed on indoor map").* The combination of Simons and Yamazaki does not specifically disclose displaying each point of interest (POA) associated a beacon identifier determined from the beacon signal on the localized area indoor

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map.

Wrappe teaches displaying each point of interest (POA) associated a beacon identifier determined from the beacon signal on the localized area indoor map (see [0013], [0033] and [0052], *"data **identify** the site, e.g., unique ID of the transmitter, identification".* Also see [0013], *"placing one or more beacon stations within a site",* also see [0013], [0052], *"when a mobile station is identified to be entering (or exiting) the site, the **commercial information** (e.g.! **electronic coupon, a web page of advertisement**) is automatically transmitted to the mobile station **for display**",* also see *[0046], "stores and shops", "whether or not the mobile station is in a store can be determined from a map of the building").*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Wrappe into the system of Simons and Yamazaki in order to provide low cost electronic components can be used for short range wireless data communication in accordance with wireless communication standards (see Wrappe, [0028]).

12a. (Applicant's Remarks): Dependent **Claim 10** depends from Independent **Claim 1**.

The Examiner relies upon Wrappe for the introduction of a step of "displaying each point of interest (POA) associated a beacon identifier determined from the beacon signal on the localized area indoor map (see [0013], [0033] and [0052], *"data **identify** the site, e.g., unique ID of the transmitter, identification".* Also see [0013], *"placing one or more beacon stations within a site",* also see [0013], [0052], *"when a mobile station is identified to be entering (or exiting) the site, the **commercial information** (e.g.! **electronic coupon, a web page of advertisement**) is automatically transmitted to the mobile station **for display**",* also see *[0046], "stores and shops", "whether or not the mobile station is in a store can be determined from a map of the building".*

Wrappe fails to teach a system having a limitation of:

> "*decoding said beacon signal to obtain said included known respective beacon physical location information, and*

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determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded from said received beacon signal;"

Applicant additionally presents Independent **Claim 1** includes limitations of:

"*broadcasting a beacon signal from each beacon of said series of beacons, wherein each* ***said beacon signal includes information associated with a known physical location of said respective beacon;***"

Applicant respectfully directs the Examiner to section 13a below regarding the above quoted limitation and additional comments regarding Wrappe.

Therefore, Applicant earnestly believes the limitations introduced and presented in section 5a above additionally overcome an introduction of Wrappe.

Applicant earnestly believes the rejection of Independent **Claim 1** pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to its dependency from Independent **Claim 1**; Dependent **Claim 10** is also nonobvious over Simons in view of Yamazaki and further in *view* of Wrappe. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claim 10** is also nonobvious over Simons in view of Yamazaki and further in *view* of Wrappe.

10B. (Examiner's Position): Regarding **Claim 11**, the combination of Simons, Yamazaki and Wrappe further teaches displaying each point of interest (POA) associated a beacon identifier determined from the beacon signal on the localized area indoor map (see Simons, [00411, " ... *may be used in places like shopping malls to provide location-specific information such as* ***local maps,*** *information on nearby* ***shops and restaurants*** *and so on, with a beacon downloading*

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information keys to a mobile device", and/or see Yamazaki, Basic-Abstract, *"User terminal receives this information based on which the current position of user and route to destination are displayed on indoor map"),* selecting a beacon location from each displayed beacon location on the localized area indoor map, obtaining information associated with each the point of interest (POA), and displaying the information associated with each the point of interest (POA) (see Wrappe, [0013], [0033] and [0052], *"data identify the site, e.g., unique ID of the transmitter, identification".* Also see [0013], *"placing one or more beacon stations within a site",* also see [0013], [0052], *"when a mobile station is identified to be entering (or exiting) the site, the* ***commercial information*** *(e.g.,* ***electronic coupon,*** **a** ***web page of advertisement)*** *is automatically transmitted to the mobile station* ***for display").***

12a. (Applicant's Remarks): Dependent **Claim 11** depends from Independent **Claim 1**.

Applicant respectfully directs the Examiner to sections 10a above and 13a below regarding the above subject rejection of Dependent **Claim 11**.

Applicant earnestly believes the rejection of Independent **Claim 1** pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to its dependency from Independent **Claim 1**; Dependent **Claim 11** is also nonobvious over Simons in view of Yamazaki and further in *view* of Wrappe. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claim 11** is also nonobvious over Simons in view of Yamazaki and further in *view* of Wrappe.

11. The Examiner rejected **Claim 12** is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Wrappe (US 2008/0280624) and McCall et al (US 6,738,628).

11A. (Examiner's Position): Regarding **Claim 12**, the combination of Simons and Yamazaki teaches scanning for any of the beacon signals using a mobile device (see Simons, [0034], see

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"the CA terminal 14 *is just within the broadcast range* 12, *and therefore the user may* receive unsolicited *or pushed service offers, adverts and the like on their CA terminal* 14 *from the beacon 10'.* Note that, in order to "receive", the terminal 14 must "scan" for the signal), detecting at least one of the broadcast beacon signals (see Simons, [0034], see *"the CA terminal* 14 *is just within the broadcast range* 12, *and therefore the user may* ***receive*** *unsolicited or pushed service offers, adverts and the like on their CA terminal 14 from the beacon 10".* Note that, in order to "receive", the terminal 14 must "detect" for the signal), receiving at least one of the beacon signal by the mobile device (see Simons, [0034], see *"the CA terminal* 14 *is just within the broadcast range* 12, *and therefore the user may* ***receive*** *unsolicited or pushed service offers, adverts and the like on their CA terminal* 14 *from the beacon 10'.* Note that, in order to "receive", the terminal 14 must "scan" for the signal),

The combination of Simons and Yamazaki does not specifically disclose customizing each beacon signal by embedding a beacon identifier within the beacon signal, wherein the beacon identifier distinguishes the beacon from the series of beacons, broadcasting the respective beacon signal comprising the embedded beacon identifier from each beacon of the series of beacons, initiating a process for obtaining marketing information associated with the beacon identifier from a remote information provider, obtaining the marketing information associated with the beacon identifier from the remote information provider, and displaying the obtained marketing information associated with the beacon identifier on the mobile device.

Wrappe teaches customizing each beacon signal by embedding a beacon identifier within the beacon signal (see [0013], [0033] and [0052], "data identify the site, e.g., unique 10, identification"), wherein the beacon identifier distinguishes the beacon from the series of beacons (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID of the transmitter, identification"), broadcasting the respective beacon signal comprising the embedded beacon identifier from each beacon of the series of beacons (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID of the transmitter, identification". Also see [0013], *"placing one or more beacon stations within a site"),* initiating a process for obtaining marketing information associated with the beacon identifier from a remote information provider (also see [0013],

Google Ex. 1029, p. 079

"commercial information of the site"), obtaining the marketing information associated with the beacon identifier from the remote information provider (also see [0013] and [0052], *"commercial information of the site"),* and displaying the obtained marketing information associated with the beacon identifier on the mobile device (also see [0052], *"when a mobile station is identified to be entering (or exiting) the site, the* ***commercial information*** *(e.g.* ***electronic coupon, a web page of advertisement)*** *is automatically transmitted to the mobile station* ***for display').***

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Wrappe into the system of Simons and Yamazaki in order to provide low cost electronic components can be used for short range wireless data communication in accordance with wireless communication standards (see Wrappe, [0028]).

The combination of Simons, Yamazaki and Wrappe does not specially disclose decoding the received beacon signal to determine the beacon identifier, transmitting a request for marketing information associated with the beacon identifier from the remote information provider.

McCall teaches decoding the received beacon signal to determine the beacon identifier (see column 4, lines 26-45, *"If a signal is received from more than one beacon, then each of the signals is decoded to determine the beacon IV'),* transmitting a request for marketing information associated with the beacon identifier from the remote information provider (see column 4, lines 26-45, *"request", "beacon ID").*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of McCall into the system of Simons, Yamazaki and Wrappe in order to automatically updates location information in a manner that needs no user intervention and is transparent to the overall management system (see McMcall, column 2, lines 43-47).

13a. (Applicant's Remarks): Dependent **Claim 12** depends from Independent **Claim 1**.

Applicant respectfully directs the Examiner to sections 10a above and 13a below regarding the above subject rejection of Dependent **Claim 12**.

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The Examiner relies upon McCall et al for the introduction of steps of "*decoding the received beacon signal to determine the beacon identifier, transmitting a request for marketing information associated with the beacon identifier from the remote information provider*"

McCall et al. fails to teach a system having a limitation of:

> "*broadcasting a beacon signal from each beacon of said series of beacons,* ***wherein each said beacon signal includes information associated with a known physical location of said respective beacon****;"*

Applicant earnestly believes the rejection of Independent **Claim 1** pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to its dependency from Independent **Claim 1**; Dependent **Claim 12** is also nonobvious over Simons in view of Yamazaki and further in *view* of Wrappe and McCall et al. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claim 12** is also nonobvious over Simons in view of Yamazaki and further in *view* of Wrappe and McCall et al.

12. The Examiner rejected **Claim 13** is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280 A1) in view of Yamazaki (JP 09126804 A) and further in view of Welch et al (US 5,319,363).

12A. (Examiner's Position): Regarding **Claim 13**, the combination of Simons and Yamazaki teaches determining a floor of the at least one enclosed structure on which the beacon signal is associated with (see Simons, [0010], [0015], [0035] and [0036], "floor"), identifying an associated floor map portion of a series of floor map portions of the localized area indoor map (see Carter, [0009], [0010], [0011] and [0032]), wherein the associated floor map portion represents the floor associated with the beacon signal (see Simons, [0010], [0015], [0035] and [0036], "beacon", "floor", [0041], "beacon", "shopping mall ... provide ... map"). The combination of Simons and Yamazaki does not specifically disclose displaying the associated

Google Ex. 1029, p. 081

floor map portion of the localized area indoor map, displaying the current location of the mobile device on the associated floor map portion of the localized area indoor map.

Welch teaches displaying the associated floor map portion of the localized area indoor map (see column 3, lines 20-23, "floor map", where *"the devices currently in use"* indoor), displaying the current location of the mobile device on the associated floor map portion of the localized area indoor map (also see column 3, lines 20-23, *"floor map",* where *"the devices currently in use"* indoor).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Welch into the system of Simons and Yamazaki in order to allow the user to visualize virtual images of the front panels of numerous (e.g., up to eight) devices (see Welch, column 3, lines 26-28).

12a. (Applicant's Remarks): Dependent **Claim 13** depends from Independent **Claim 1**.

The Examiner relies upon Welch et al. for the introduction of a step of displaying the associated floor map portion of the localized area indoor map, displaying the current location of the mobile device on the associated floor map portion of the localized area indoor map.

Welch et al. fails to teach a system having a limitation of:

> "*decoding said beacon signal to obtain said included known respective beacon physical location information, and*
>
> ***determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon respective beacon physical location information decoded from said received beacon signal;***"

Therefore, Applicant earnestly believes the limitations introduced and presented in section 5a above additionally overcome an introduction of Welch et al.

Google Ex. 1029, p. 082

Applicant earnestly believes the rejection of Independent **Claim 1** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to its dependency from Independent **Claim 1**; Dependent **Claim 13** is also nonobvious over Simons in view of Yamazaki and further in *view* of Welch et al. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claim 13** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Yamazaki and further in *view* of Welch et al.

13. The Examiner rejected **Claims 14-17, 20 and 21** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280 A1) in view of Wrappe (US 2008/0280624) and further in view of McCall et al (US 6,738,628).

13A. (Examiner's Position): Regarding **Claim 14**, Simons teaches a method of mapping a localized area comprising an interior of at least one enclosed structure (Abstract, "beacons 30, 32, 33", and [0016], "several beacons located a few meters apart"), the method comprising steps of: deploying a series of beacons about the localized area comprising at least one enclosed structure (Abstract, "beacons 30, 32, 33", and [0016], "several beacons located a few meters apart"), wherein at least a portion of the series of beacons are located to transmit within an interior of the at least one enclosed structure (see Abstract, *[0005] to* [0018], "beacons" and "broadcast"), scanning for any of the beacon signals using a mobile device, detecting at least one of the broadcast beacon signals (see [0034], see" *the CA terminal* 14 *is just within the broadcast range* 12, *and therefore the user may* ***receive*** *unsolicited or pushed service offers, adverts and the like on their CA terminal* 14 *from the beacon 10".* Note that, in order to "receive", the terminal 14 must "scan" for the signal), receiving at least one of the beacon signal by the mobile device (see [0034], see *"the CA terminal* 14 *is just within the broadcast range* 12, *and therefore the user may* ***receive*** *unsolicited or pushed service offers, adverts and the like on their CA terminal* 14 *from the beacon 10').*

Google Ex. 1029, p. 083

Simons does not specifically disclose customizing each beacon signal by embedding a beacon identifier within a beacon signal, wherein the beacon identifier distinguishes the beacon from the series of beacons, broadcasting the respective beacon signal comprising the embedded beacon identifier from each beacon of the series of beacons, initiating a process for providing marketing information associated with the beacon identifier to the mobile device, obtaining the marketing information associated with the beacon identifier, and displaying the marketing information on the mobile device.

Wrappe teaches customizing each beacon signal by embedding a beacon identifier within a beacon signal (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID, identification"), wherein the beacon identifier distinguishes the beacon from the series of beacons (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID of the transmitter, identification"), broadcasting the respective beacon signal comprising the embedded beacon identifier from each beacon of the series of beacons (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID of the transmitter, identification". Also see [0013], *"placing one or more beacon stations within a site"),* initiating a process for providing marketing information associated with the beacon identifier to the mobile device (also see [0013], *"commercial information of the site"),* obtaining the marketing information associated with the beacon identifier (also see [0013] and [0052], *"commercial information of the site"),* and displaying the marketing information on the mobile device (also see [0052], *"when a mobile station is identified to be entering (or exiting) the site, the* ***commercial information*** *(e.g.! **electronic coupon, a web page** of **advertisement**) is automatically transmitted to the mobile station **for display"**).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Wrappe into the system of Simons in order to provide low cost electronic components can be used for short range wireless data communication in accordance with wireless communication standards (see Wrappe, [0028]).

The combination of Simons and Wrappe does not specially disclose decoding the received beacon signal.

Google Ex. 1029, p. 084

McCall teaches decoding the received beacon signal (see column 4, lines 33-36, *" If a signal is received from more than one beacon, then each of the signals is decoded to determine the beacon ID').* Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of McCall into the system of Simons and Wrappe in order to automatically updates location information in a manner that needs no user intervention and is transparent to the overall management system (see McCall, column 2, lines 43-47).

13a. (Applicant's Remarks): Claim 14 is an Independent claim.

Applicant has amended Independent **Claim 14** to more clearly and concisely define the present invention as follows:

"deploying a series of beacons about said localized area comprising at least one enclosed structure, wherein at least a portion of said series of beacons are located to transmit within an interior of said at least one enclosed structure;

customizing each beacon signal by embedding a beacon identifier within a beacon signal, wherein said beacon identifier distinguishes said beacon from said series of beacons;

broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons, wherein each said respective beacon signal includes information identifying a unique physical location of each respective beacon, wherein said identification information is associated with a known physical location of said respective beacon;

scanning for any of said beacon signals using a mobile device;

detecting at least one of said broadcast beacon signals;

receiving at least one of said beacon signal by said mobile device;

decoding said received beacon signal to obtain at least one of said beacon identifier and said included known respective beacon physical location information;

Google Ex. 1029, p. 085

initiating a process for providing marketing information associated with said beacon identifier to said mobile device;

obtaining at least one of local based services program and said marketing information associated with said ~~beacon identifier~~ at least one of said beacon identifier and said included known respective beacon physical location information; and

displaying said obtained at least one of local based services program and said marketing information on said mobile device."

Applicant utilizes at least one of said beacon identifier and said included known respective beacon physical location information to obtain specific local based services program and said marketing information associated therewith.

The Examiner relies upon Simons for the use of beacons to determine a localized area mapping. Applicant respectfully notes, Simons fails to teach a limitation of:

> "*broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons, wherein each said respective beacon signal includes information identifying a unique physical location of each respective beacon, wherein said identification information is associated with a known physical location of said respective beacon;"*

Simons utilizing a proximity to the beacon to push information from the beacon to the user. This adaptation does not require any encoding and transmission of geographic location information from the beacon to the mobile device.

The Examiner relies upon Wrappe to introduce the limitation of "embedding a beacon identifier within a beacon signal".

Applicant respectfully asserts, the beacon identifier simply provides a unique ID thereof.

Google Ex. 1029, p. 086

Applicant has amended Independent Claim 14 to more clearly and concisely define the present invention as including a limitation of:

> *"broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons, wherein each said respective beacon signal includes information identifying a unique physical location of each respective beacon, wherein said identification information is associated with a known physical location of said respective beacon;"*

The examiner relies upon Wrappe for the utilization of a Bluetooth signal.

Wrappe fails to teach an inclusion of the limitation of:

> *"broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons,* ***wherein each said respective beacon signal includes information identifying a unique physical location of each respective beacon, wherein said identification information is associated with a known physical location of said respective beacon****;"*

Wrappe teaches the following in Paragraph [0010]:

"[0010] In one embodiment of the present invention, microcell beacons that are based on low cost, mass market electronics for wireless local area data communication (e.g., Bluetooth or WiFi) are used to broadcast to mobile stations location information and/or identification information, which can be used to look up for the location information, to improve the precision of position solutions in a wide area position determination system (e.g., a GPS system, an AFLT system, or a hybrid system). In one embodiment, the location information and/or the identification information are site specific; and, the distribution and the transmission strength of the microcell beacons are adjusted to prevent misidentification. In one embodiment, the microcell beacons have the transmission capability but not the receiving capability for wireless local area data communication; and, the mobile station has the receiving capability but not the transmission capability for wireless local area data communication. The location information

Google Ex. 1029, p. 087

may be the coordinates (e.g., longitude, latitude and altitude), the physical addresses (e.g., street address), or other location specific information (e.g., an identification number of an area)."

Additionally, Wrappe teaches the following in Paragraph [0033]:

"[0033] In one embodiment of the present invention, the microcell beacon broadcasts identification information (e.g., the unique ID of the transmitter, a street address, an identity of a commercial site), which can be used to look up for a position coordinate of the transmitter. The identification information broadcast at the microcell beacon and received at the mobile station may be further transmitted from the mobile station to a remote server (e.g., a position determination identity) using the cellular communication link of the mobile station to determine the position of the mobile station. The cellular communication link may be in accordance with Telecommunications Industry Association (TIA)/Electronic Industries Alliance (EIA) Standards, such as IS-95, IS-856 or IS-2000. For example, the cellular communication system may be based on TDMA (Time Division Multiple Access), GSM (Global System for Mobile communications), CDMA (Code Division Multiple Access), W-CDMA (Wideband Code Division Multiple Access), UMTS (United Mobile Telecommunication System), TD-SCDMA (Time Division Synchronous Code Division Multiple Access), IDEN (Integrated Digital Enhanced Network), HDR (High Data Rate), or other similar cellular networks. Alternatively, the microcell beacon transmits its location coordinates so that the mobile station can choose an optimal location for a particular environment by combining the location information it receives from various transmitters (e.g., microcell beacons, GPS satellites, cellular communication base stations). For example, altitude information broadcast by the microcell beacon can be used for altitude aiding in determining the position of the mobile station."

Additionally, Wrappe teaches the following in Paragraph [0036]:

"[0036] In one embodiment, the mobile station supports only the receiving capability of Bluetooth or WiFi to further reduce the cost impact on the mobile station. Alternatively, the mobile station may have very limited transmission capability for wireless local area data communication so that effectively the mobile station can only receive data from the microcell

Google Ex. 1029, p. 088

beacon but not transmit data to the microcell beacon through the Bluetooth (or WiFi) radio. The limited transmission capability may be used for data communication with devices other than the microcell beacons. Similarly, the microcell beacon may support only the transmission capability of WiFi or Bluetooth, but not the receiving capability, to reduce the cost."

Applicant respectfully asserts, each of the above fails to teach the inclusion of the location information specifically within the identifier portion of the signal.

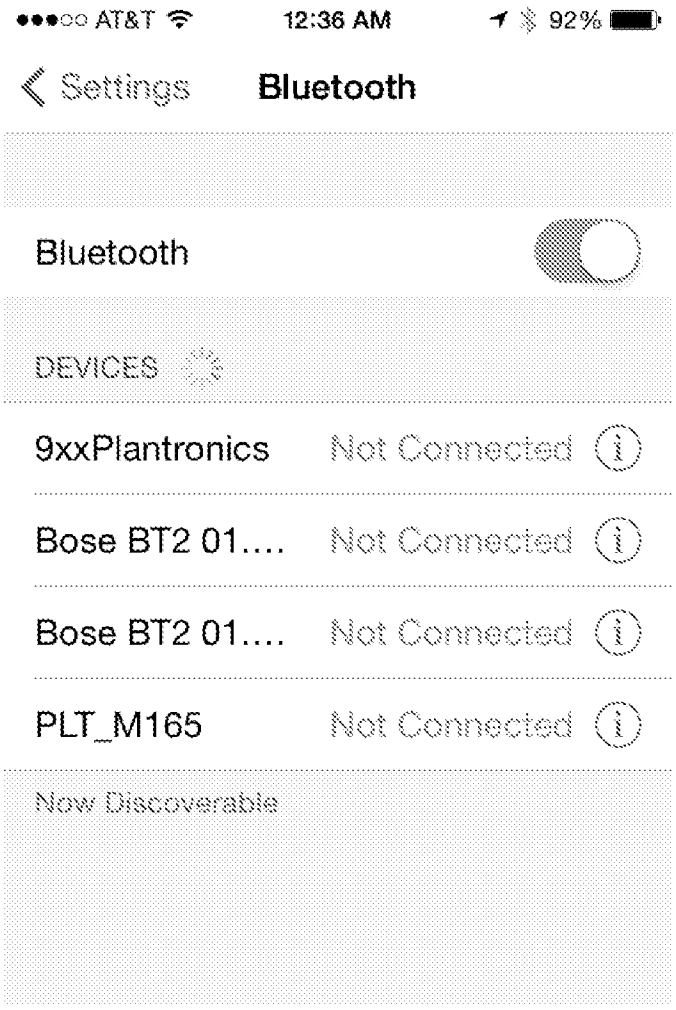
Wrappe affirms this in the following: "the microcell beacon broadcasts identification information (e.g., the unique ID of the transmitter, a street address, an identity of a commercial site)". Wrappe teaches a signal wherein the unique ID of the transmitter is distinct from the location information.

Conversely, the location information IS the unique ID of the transmitter, not IN ADDITION TO the unique ID of the transmitter (with emphasis).

The identifier packet or identifier portion of the signal is the portion of the signal that is received prior to establishing a bi-directional pairing. A bidirectional pairing for both a Bluetooth system and a Wi-Fi signal requires acceptance by the receiving party.

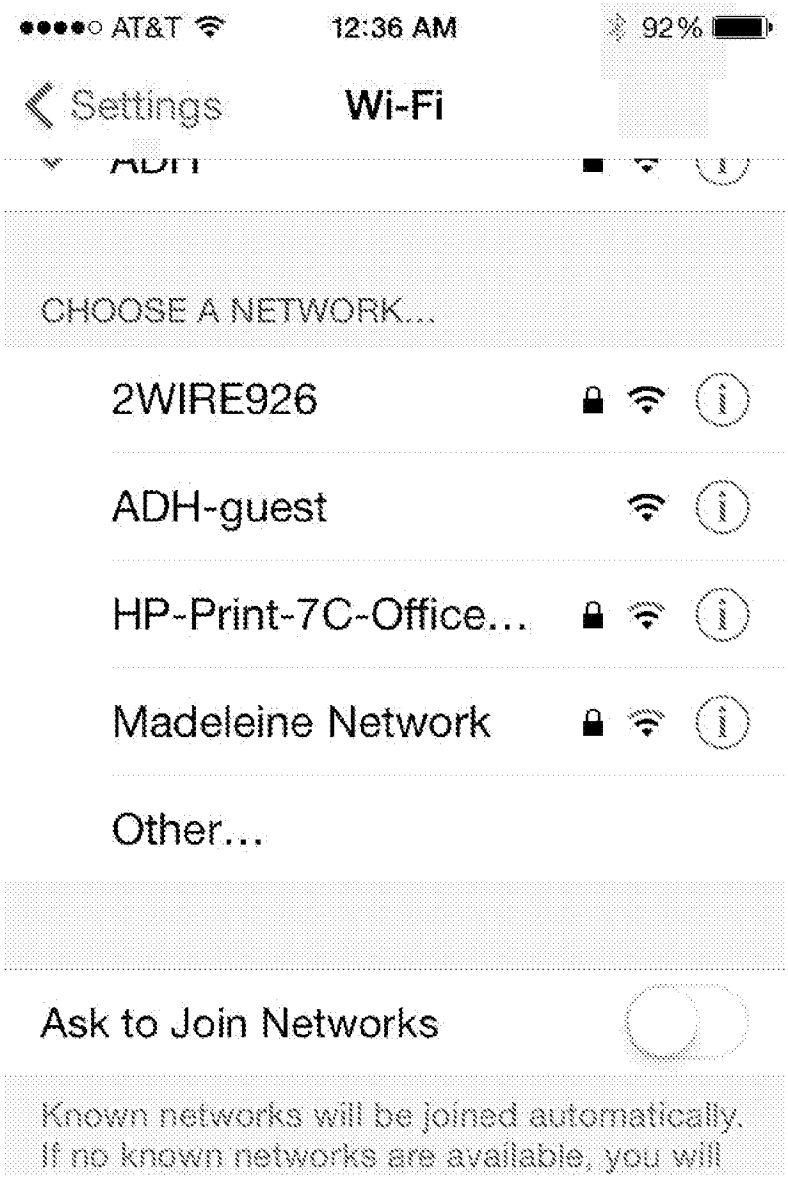
To provide clarity to the Examiner regarding the identifier packet, Applicant has inserted two examples below of pairing screens. The first is representative of a Bluetooth pairing screen. The second is representative of a Wi-Fi pairing screen.

Google Ex. 1029, p. 089



Example 1: Bluetooth pairing Screen

Google Ex. 1029, p. 090



Example 2: WiFi pairing Screen

In the first example:

The first Bluetooth unique ID of the transmitter is “9xxPlantronics”.

The second Bluetooth unique ID of the transmitter is “Bose BT2 01…”

Google Ex. 1029, p. 091

The third Bluetooth unique ID of the transmitter is also "Bose BT2 01…"

The fourth Bluetooth unique ID of the transmitter is "PLT_M165".

In the second example:

The first Wi-Fi unique ID of the transmitter is "2WIRE926".

The second Wi-Fi unique ID of the transmitter is "ADH-Guest"

The third Wi-Fi unique ID of the transmitter is also "HP-Print-7C-Office…"

The fourth Wi-Fi unique ID of the transmitter is "Madeleine Network".

The above presents examples of the unique ID of the transmitter as defined by Wrappe.

Applicant respectfully notes, the unique ID of the transmitter, as taught by Wrappe, differs from the present invention, which includes the location information within (or preferably as) the unique ID of the transmitter.

In an example associated with the present invention, the identifier would state: "Location: 26.3153° N, 80.2406° W". This would provide an exact known location of the beacon to the user. The system would utilize the signal strength and/or triangulation the further refine the precise location of the mobile device (the user).

In a second example associated with the present invention, the identifier would state: "Location: 1234 Main Street, Anywhere, USA 00001". This would provide an exact known location of the beacon to the user by an address. Again, the system would utilize the signal strength and/or triangulation the further refine the precise location of the mobile device (the user).

Google Ex. 1029, p. 092

In a third example associated with the present invention, the identifier would state: "Location: Department Store X, Isle 4, 10 Feet West". This would provide an exact known location of the beacon to the user within the known store. Again, the system would utilize the signal strength and/or triangulation the further refine the precise location of the mobile device (the user).

The Examiner relies upon McCall et al. to introduce the limitation of "decoding the received beacon signal"

McCall et al. fails to teach a system having a limitation of:

> "*broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons,* ***wherein each said respective beacon signal includes information identifying a unique physical location of each respective beacon, wherein said identification information is associated with a known physical location of said respective beacon****;"*

Applicant earnestly believes the rejection of Independent **Claim 14** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Wrappe and further in view of McCall et al has been overcome by amendments and remarks submitted herein. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Independent **Claim 14** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Wrappe and further in view of McCall et al.

13B. (Examiner's Position): Regarding **Claim 15**, Simons teaches the beacon signal is a short range radio frequency being at least one of a Bluetooth Signal and a Wi-Fi signal, the method further comprising a step of: transmitting the beacon signal as at least one of the Bluetooth signal and the Wi-Fi signal (see [0033], [0038], [0046], [0047] and [0048], *"Bluetooth", "IEEE').*

13b. (Applicant's Remarks): Dependent **Claim 15** depends from Independent **Claim 14**.

Google Ex. 1029, p. 093

Applicant respectfully directs the Examiner to the summary presented in section 13g below.

13C. (Examiner's Position): Regarding **Claim 16**, the combination of Simons, Wrappe and McCall further teaches determining a location of the mobile device respective to the beacon associated with the received beacon signal (see Simons, fig.1, **range** 12, [0034], see" *the CA nterminal* 14 *is just within the broadcast* ***range*** 12,*and therefore the user may receive unsolicited or pushed* ***service offers. adverts*** *and* ***the like*** *on their CA terminal* 14 *from the beacon 10',* see Simons, [0016], *"airport',* [0020], *"shopping mall', "airport', "service",* and/or see Wrappe, [0052], *"when* a *mobile station is identified to be* ***entering*** *(or exiting)* ***the*** *site, the* ***commercial information*** *(e.9"1* ***electronic coupon. a web page of advertisement)*** *is automatically transmitted to the mobile station* ***for*** *display'),* displaying the location of the mobile device respective to the beacon associated with the received beacon signal on the mobile device (see Wrappe, [0052], *"when* a *mobile station is identified to be* ***entering*** *(or exiting)* ***the*** *site, the* ***commercial information*** *(e.g., electronic coupon, a web page of advertisement) is automatically transmitted to the mobile station* ***for*** *display".* Note that in [0013], where Wrappe teaches associating *"the data identifying the site"* with *"commercial information",* where *"the data identifying the site"* includes *"a coordinate position",* so that when the mobile station enters the site, the location of the site which is the same location of the mobile device is displayed on the mobile station. In addition, also see [0013], *"transmitted according Bluetooth", [0029], "Bluetooth provides* a *short range (e.g., 10 centimeters to* 10 *meters").*

13c. (Applicant's Remarks): Dependent **Claim 16** depends from Independent **Claim 14**.

Applicant respectfully directs the Examiner to the summary presented in section 13g below.

13D. (Examiner's Position): Regarding **Claim 17**, the combination of Simons, Wrappe and

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McCall further teaches determining a location of the mobile device respective to the beacon associated with the received beacon signal, wherein location is determined using at least one of: signal strength of the beacon signal, triangulation using two or more beacon signals, and location information embedded within the beacon signal, and displaying the location of the mobile device respective to the beacon associated with the received beacon signal on the mobile device (see Simons, fig.1, range 12, and see [0009], *"range dependent upon the power of the beacon"*. In this case, if the power of the beacon is strong, a geographic location proximate the beacon is closer, on the other hand, if the power of the beacon is weak, a geographic location proximate the beacon is faraway.

In addition, see **Claim 5** above, where Gwon, [0076], teaches" *If* a *number* of *BTS cells are present such that the mobile node is receiving beacon signal§. from* at *least three BTS', conventional triangulation techniques based* on *relative beacon signal strength measurements can be used to determine the mobile node's distance from each BTS. Another way is to use GPS').*

13d. (Applicant's Remarks): Dependent **Claim 17** depends from Independent **Claim 14**.

Applicant respectfully notes, the subject rejection refers to Gwon, which is not cited as a reference in the rejection.

Applicant respectfully directs the Examiner to the summary presented in section 13g below.

13E. (Examiner's Position): Regarding **Claim 20**, the combination of Simons, Wrappe and McCall further teaches utilizing beacon signals from the series of beacons to aid in navigation to the mobile device, when the mobile device is located within an interior of a structure where a global positioning system (GPS) is ineffective (see Wrappe, [0044] and [0046], *"where GPS signal blockage severely degrades").*

13e. (Applicant's Remarks): Dependent **Claim 20** depends from Independent **Claim 14**.

Google Ex. 1029, p. 095

Applicant respectfully directs the Examiner to the summary presented in section 13g below.

13F. (Examiner's Position): Regarding **Claim 21**, the combination of Simons, Wrappe and McCall further teaches transmitting an arrival notification signal upon arrival proximate to one beacon of the series of beacons to notify at least one other party of arrival at the one beacon (see Wappe, [0046], *"when the mobile station enters the store, the dominant beacon signals received at the mobile station identifies the store"*, and/or see McCall, column 6, lines 39-42, *"At each point on the grid, the system sends a message back to the server with its position, entered by the technician, and a list of the beacons it can receive").*

13f. (Applicant's Remarks): Dependent **Claim 21** depends from Independent **Claim 14**.

Applicant respectfully directs the Examiner to the summary presented in section 13g below.

13g. (Applicant's Summary): Applicant earnestly believes the rejection of Independent **Claim 14** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Wrappe and further in view of McCall et al. has been overcome by amendments and remarks submitted in section 5a above. It necessarily follows that due to their dependency from Independent **Claim 1**; Dependent **Claims 15-17, 20 and 21** are also nonobvious over Simons in view of Wrappe and further in view of McCall et al. Applicant respectfully requests the Examiner reconsider and withdraw the rejection of Dependent **Claims 15-17, 20 and 21** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons in view of Wrappe and further in view of McCall et al.

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14. The Examiner rejected **Claims 18 and 19** under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US *2003/0045280 A1)* in view of Wrappe (US 2008/0280624) and further in view of McCall et al (US 6,738,628) and Kishi et al (US 5,638,279).

14A. (Examiner's Position): Regarding **Claim 18**, the combination of Simons, Wrappe and McCall further teaches determining a location of the mobile device respective to the beacon associated with the received beacon signal (see Simons, fig.1, **range** 12, [0034], see *"the CA terminal* 14 *is just within the broadcast* ***range*** 12, *and therefore the user may receive unsolicited or pushed* ***service offers! adverts*** *and* ***the like*** *on their CA terminal* 14 *from the beacon 10',* see Simons, [0016], *"airport',* [0020], *"shopping malf', "airport', "service's,* obtaining a localized area map associated with the location of the beacon (see Simons, [0041], "beacon", "shopping mall. .. provide ... map"), determining a location of each of the mobile device and the beacon on the localized area map (see Simons, [0041], "beacon", "shopping mall. .. provide ... map", and/or see Wrapper, [0046], *"stores and shops", "whether or not the mobile station is in a store can be determined from a map* of *the building"),* displaying the location of the mobile device respective to the beacon (see Wrappe, [0052], *"when a mobile station is identified to be* ***entering*** *(or exiting)* ***the site,*** *the* ***commercial information*** *(e.g., electronic coupon, a web page of advertisement) is automatically transmitted to the mobile station* ***for display.*** Note that in [0013], where Wrappe teaches associating" *the data identifying the site"* with *"commercial information",* where *"the data identifying the site"* includes *"a coordinate position",* so that when the mobile station enters the site, the location of the site which is the same location of the mobile device is displayed on the mobile station. In addition, see [0013], *"transmitted according Bluetooth",* [0029], *"Bluetooth provides a short range (e.g., 10 centimeters to* 10 *meters",* also see [0046], *"map of the building").*

The combination of Simons, Wrappe and McCall does not specifically disclose displaying the location of the mobile device respective to the beacon identifier overlaid upon the localized area map on the mobile device.

Kishi teaches displaying the location of the mobile device respective to the beacon

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identifier overlaid upon the localized area map on the mobile device (see fig.10, column 2, lines 63-67, *"a single wave (or beacon) generated from a signpost in the vicinity of an intersection"*, and see column 7, lines 30-52, *"the name of the intersection is displayed at an intersection-name display 34a in the upper-right portion of the screen on which the map around the present position is displayed")*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Kishi into the system of Simons, Wrappe and McCall in order to automatically updates location information in a manner that needs no user intervention and is transparent to the overall management system (see Kishi, column 2, lines 43-47).

19A. (Examiner's Position): Regarding **Claim 19**, the combination of Simons, Wrappe, McCall and Kishi further teaches the beacon associated with the received beacon signal is located within an enclosed structure (see Simons, fig.1, **range** 12, [0034], see *"the CA terminal* 14 is *just within the broadcast* ***range*** 12,*and therefore the user may receive unsolicited or pushed* ***service offers. adverts*** *and* ***the like*** *on their CA terminal* 14 *from the beacon 10"*, also see [0016], *"airport"*, [0020], *"shopping mall', "airport", "service"),* the method further comprising steps of: determining a location of the mobile device respective to the beacon associated with the received beacon signal (also Simons, fig.1, **range** 12, [0034], see *"the CA terminal* 14 *is just within the broadcast* ***range*** 12, *and therefore the user may receive unsolicited* or *pushed* ***service offers, adverts*** *and* ***the like*** *on their CA terminal* 14 *from the beacon 10"*, also see [0016], *"airport"*, [0020], *"shopping mall", "airport", "service"),* obtaining a localized area indoor map associated with the location of the beacon (see [0041], "beacon", "shopping mall ... provide ... map"), determining a location of each of the mobile device and the beacon on the localized area indoor map (also Simons, fig.1, **range** 12, [0034], see *"the CA terminal* 14 *is just within the broadcast* ***range*** 12,*and therefore the user may receive unsolicited or pushed* ***service offers, adverts*** *and* ***the like*** *on their CA terminal* 14 *from the beacon 10"*, also see *[0016], "airport"*, [0020], *"shopping*

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mall", "airport", "service", [0041], "beacon", "shopping mall. .. provide ... map", and/or see Wrapper, [0046], *"stores and shops", "whether or not the mobile station is in* a *store can be determined from* a *map* of *the building"),* displaying the location of the mobile device respective to the beacon associated with the received beacon signal overlaid upon the localized area map on the mobile device (see Kishi, fig.10, column 2, lines 63-67, *"a single wave (or beacon) generated from a signpost in the vicinity of an intersection",* and see column 7, lines 30-52, *"the name of the intersection is displayed at an intersection-name display 34a in the upper-right portion of the screen on which the map around the present position is displayed").*

Allowable Subject Matter

15. The Examiner objected to **Claim 8** as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15A. (Examiner's Position): Regarding **Claim 8**, the combination of Simons and Yamazaki teaches traveling from the current location towards a subsequent location (see Simons, [0019] and [0020], "move"). The combination of Simons and Yamazaki fails to teach repeating the steps of determining a location of a mobile device to determine the subsequent location, determining a path between the current location and the subsequent location, and associating the current location and the subsequent location.

15a. (Applicant's Remarks): Applicant expresses his sincerest gratitude to the Examiner for recognition of allowable subject matter in Dependent **Claim 8**.

Dependent **Claim 8** depends directly from Independent **Claim 1**.

Applicant has Amended **Claim 8** from a Dependent Claim into an Independent Claim. Applicant has introduced the elements of Base **Claim 1** into **Claim 8** as follows:

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"A method of mapping a localized area comprising an interior of at least one enclosed structure, the method comprising steps of:

deploying a series of beacons about said localized area comprising at least one enclosed structure, wherein at least a portion of said series of beacons are located to transmit within an interior of said at least one enclosed structure;

broadcasting a beacon signal from each beacon of said series of beacons;

determining a location of a mobile device in accordance with following steps:

scanning for any of said beacon signals using a mobile device,

detecting at least one of said broadcast beacon signals,

receiving at least one of said beacon signal by said mobile device, wherein said beacon signal is broadcast from a beacon of said series of beacons located proximate said mobile device, and

determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon information collected from said received beacon signal;

determining an indoor map associated with said localized area;

displaying said localized area indoor map;

displaying said current location of said mobile device on said localized area indoor map;

traveling from said current location towards a subsequent location;

repeating said steps of determining a location of a mobile device to determine said subsequent location;

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determining a path between said current location and said subsequent location; and

associating said current location and said subsequent location."

Applicant earnestly believes Independent **Claim 8** is in condition for allowance.

Support for New Claims

12a. (Applicant's Remarks): Dependent **Claim 22** depends from Independent **Claim 1**. Dependent **Claim 22** includes limitations of "further comprising a step of:

providing navigation to said user upon an emergency condition."

Support for the limitations is provided in FIG. 8 (element 802) and the associated portion of the Specification found in Col. 15, Lines 46-50 of Parent US Application 11/429,864, issued as US Patent 8,836,580 on September 16, 2014, which states:

"Special operating mode:—First response navigation, 802—More over the disclosed system can serve as a navigator for the emergency exit route when and where needed each user can load the emergency exit floor plan and escape with the knowledge of his exact location in that route."

12b. (Applicant's Remarks): Dependent **Claim 23** depends from Independent **Claim 1**. Dependent **Claim 23** includes limitations of "further comprising a step of:

providing navigation to assist said user in exiting said structure upon an emergency condition."

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Support for the limitations is provided in FIG. 8 (element 802) and the associated portion of the Specification found in Col. 15, Lines 46-50 of Parent US Application 11/429,864, issued as US Patent 8,836,580 on September 16, 2014, which is quoted in section 12a above.

12c. (Applicant's Remarks): Dependent **Claim 24** depends from Independent **Claim 1**.

Dependent **Claim 24** includes limitations of "further comprising a step of:

communicating with an E-911 network."

Support for the limitations in **Claim 24** is provided in FIG. 9 and the associated portion of the Specification (found in Col. 21, Lines 4-18) of Parent US Application 12/932,811, issued as US Patent 8,941,485 on January 15, 2015, which states:

"FIG. 9 is illustrates the mall directory as part of the option of mall applications according to an embodiment of the present invention referring to FIG. 9, it's illustrates the indoor application in the user mobile phone as a buttons each represent the indoor programs to be available describe in FIG. 8, from (**801**) parking and return 2 parking, (**802**) the directory, (**803**) the search and find (**804**) represent navigation request between the known way points, (**805**) the sales, specials, coupons, (**806**) will provide the user with emergency and notification and exit route and emergency procedure that so important to building/area in case of emergency (9/11, Virginia tech etc.) To a secure panic button (**807**) that can trigger locate the user (like 911 call) in the area by the security personal and (**808**) button provides information and event info. About the area/facility/mall/store."

12c. (Applicant's Remarks): Dependent **Claim 25** depends from Independent **Claim 1**.

Dependent **Claim 25** includes limitations of "further comprising a step of:

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initiating at least one location based service (LBS), wherein the location based service (LBS) is associated with said current location of said mobile device."

Support for the limitations in **Claim 25** is provided in Paragraphs [00423], [00424], [00542], and others, which are quoted below:

"[00423] The various methods disclosed can also provide a way of surveying the behavior and preferences of the "user" shopper simply by observing the signals (encoding Bluetooth naming key) given off by their mobile phones and associate it with the proximity beacon ID which they are near and at the same time provide the shopper with a unique special application for indoor navigation triggering a local based services applications."

"[00424] The present invention provides a next generation approach to the location based services (LBS) market, especially to indoor applications and to areas where a GPS cannot provide accurate navigation."

"[00542] It is another object of the present invention to provide a method of special application for local business, mall/departments store or regular store, buildings, downtown centers and other facility area especially but not limited to indoors with a use of triggering application that uses the proximity ID of the detected beacons in the area."

12d. (Applicant's Remarks): Dependent **Claim 26** depends from Independent **Claim 1**.

Dependent **Claim 26** includes limitations of "further comprising a step of:

initiating a direct link to a website."

Support for the limitations in **Claim 26** is provided in Paragraphs [00437], [00522], and others, which are quoted below:

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"[00437] Alternatively, or in addition, when a mobile device makes first contact with a beacon in the beacon infrastructure, that beacon can transmit to the mobile device a list of unique identifiers (e.g. beacons ID) of other beacons in the beacon close infrastructure and other information about the beacon infrastructure, such as a name, geofence data, one or more websites associated with the beacon infrastructure."

"[00522] For example, each beacon in the beacon infrastructure can provide data in its broadcast signal that indicates that the beacon is part of a beacon infrastructure. Alternatively, or in addition, when a mobile device makes first contact with a beacon in the beacon infrastructure, that beacon can transmit to the mobile device a list of unique identifiers (e.g. beacons ID) of other beacons in the beacon close infrastructure and other information about the beacon infrastructure, such as a name, geofence data, one or more URLs to websites associated with the beacon infrastructure. Beacon infrastructure can be located in any geographic region, including businesses (e.g., shopping malls, retail stores, restaurants), landmarks (e.g., museums, airports, parks, entertainment venues) and any other environments where location based services are desired"

12e. (Applicant's Remarks): Dependent **Claim 27** depends from Independent **Claim 1**.

Dependent **Claim 27** includes limitations of "further comprising a step of:

providing assistance to a wireless payment process using said mobile device."

Support for the limitations is provided in Col 4, Lines 44-47 of Parent US Application 12/930,735, issued as US Patent 9,020,687 on April 28, 2015, which states:

"The user may wish to use his car ID as replacement or add-on for payment such as toll roads, pay to park or at the gas station using his car ID wirelessly as a payment trigger mechanism."

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12f. (Applicant's Remarks): Dependent **Claim 28** depends from Independent **Claim 1**.

Dependent **Claim 28** includes limitations of "further comprising a step of:

displaying said current user location depicted within a circle on a display of said mobile device."

Support for Dependent **Claim 28** is provided in Paragraph [00152] of Pending Parent Application Serial Number 13/135,421, which states:

"[00152] Turning to Fig.6, the drawing illustrates a use of the disclosed method in searching for a user initiate an emergency/help/panic button in a building 601 even from outside of the building. In an emergency situation the mobile phone 100 would emit an emergency beacon, which would be scanned from outside by the scanner 200 with the screen 402. The scanned and decoded data 403 would be shown on the screen 402 or on the external computer or screen 405, with a circle 406 that shows the detected devices around the area."

Additional support for **Claim 28** is provided in Application Serial Number 12/587,042, filed on Oct 1, 2009, which issued as US Patent 8,866,673 on Oct 21, 2014, all of which is incorporated by reference.

Additional Support for Dependent **Claim 28** is provided in FIG. 11 and the associated portion of the Specification (Col. 22, Lines 26-40), which states:

"FIG. 11 is illustrates of the return2parking method according to an embodiment of the present invention referring to FIG. 11, a long range Bluetooth with set ID (**1100**) with range over 1000 m will be install inside the parked car (**1101**) as a separate device (**1100**) or part of the car by manufacture and have an antenna (**1102**) built in the car to provide the signal broadcasting of the car ID, that car ID will be scan by the return2parking application to the user cell phone (**100**) and the scanning result will be display inside a circle represent range (**1103**) and (**1104**) where

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each circle represent the range to the car where (**1105**) represent the direction to the parked car, the user can find his parking car inside a garage outside an area to the accuracy of less then 10 m directly to his cell phone (**100**) without need for Internet bandwidth or even Internet or cellular communication."

12g. (Applicant's Remarks): Dependent **Claim 29** depends from Independent **Claim 1**.

Dependent **Claim 29** includes limitations of "further comprising a step of:

displaying the user location in the immediate area depicted within a circle having a radius representing an accuracy of said current user location of said mobile device."

Support for Dependent **Claim 29** is provided in Paragraph [00209] of the subject Application, which states:

"[00209] The overlay add-up device/display works like a VOR and provides add-up display shows automatically the user location in the immediate area in a circle represent a radius of accuracy and proximity distance from the local detect beacon/tag."

12h. (Applicant's Remarks): Dependent **Claim 30** depends from Independent **Claim 1**.

Dependent **Claim 30** includes limitations of "further comprising a step of:

employing said mobile device for providing communication with at least one of:

social networking, [00242], [00380], [00403], and others

emergency, (1560 of FIG. 11), [00587], [00621], [00630], [00658], and others

chat, [00587]

exchange messaging, [00587]

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stationary location to vehicle communication, [00636]

vehicle communication to stationary location communication, and [00623] (vehicle to roadway)

vehicle to vehicle communication. [00636]

12i. (Applicant's Remarks): Dependent **Claim 31** depends from Independent **Claim 1**.

Dependent **Claim 31** includes limitations of "wherein said mobile device is a first mobile device, further comprising at least two more mobile devices, wherein each at least two more mobile devices is in operation like said first mobile device,

wherein each of said first mobile device and said at least one more mobile device is adapted to change from a first communicate link with one mobile device to a second communication link with any other different mobile device of the at least two more mobile devices."

Support for Dependent **Claim 31** is provided in FIG. 13 and the associated portion of the specification, more specifically, Paragraph [00660], which states:

"[00660] FIG. 13 presents an exemplary schematic diagram illustrating a method of utilizing dynamic deployment to create an ad hoc network. Exemplary applications include vehicle-to-vehicle communication, emergency communication, local communication, and the like. The method establishes communication between a series of Bluetooth devices located proximate one another. One exemplary implementation employs cellular phones (101), utilizing the Bluetooth transceivers integrated therewith. The dynamic network is created by placing proximally located Bluetooth devices into an ad hoc or mesh network. The network is based upon overlapping signal transmission radii. The network can include installed and/or mobile Bluetooth devices, exclusive of cellular or other higher powered and costly communication

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interfaces. The method can be utilized in transportation creating a road size networking of vehicles and/or drivers for telematics or traffic information, a push alert providing road information, and creating a vehicle-to-vehicle communication capability. In another option, the network can be utilized in an emergency situation, more specifically, when and where the cellular network are unavailable, interrupted, down, or fail. The ad hoc network creates a longer range communication capability utilizing local low power Bluetooth and/or Wi-Fi devices to convey information to local emergency responders or other parties. Another optional feature of the dynamic deployment enables creation of an ad hoc network within a structure, a mall, a store, a building, an office, an entertainment complex, and the like, exclusive of cellular communication. The ad hoc network provides capability for local messaging between users in a proximity area. The network can be utilized to deliver local content to the cellular phone (101) exclusive of any broader and higher powered communication networks, such as cellular, and the like. The network would be applicable between cellular phones (101) vehicles comprising the appropriate transceiver technology (106), within a facility/building/area, and the like."

12j. (Applicant's Remarks): Dependent **Claim 32** depends from Independent **Claim 1**.

Dependent **Claim 32** includes limitations of "wherein said mobile device is a first mobile device, further comprising at least one more mobile device, wherein each at least one more mobile device is in operation like said first mobile device,

wherein said first mobile device and said at least one more mobile device are adapted to communicate with one another forming a social network."

Support for Dependent **Claim 32** is provided in FIG. 13 and the associated portion of the specification, more specifically, Paragraph [00660], which is quoted in section 12i above.

12k. (Applicant's Remarks): Dependent **Claim 33** depends from Independent **Claim 1**.

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Dependent **Claim 33** includes limitations of "wherein one beacon of said plurality of beacons is adapted to communicate with other beacons of said plurality of beacons forming a social network, wherein said social network is established and supported by sharing beacon identifiers."

Support for Dependent **Claim 33** is provided in FIG. 13 and the associated portion of the specification, more specifically, Paragraph [00660], which is quoted in section 12i above.

12l. (Applicant's Remarks): Dependent **Claim 34** depends from Independent **Claim 1**.

Dependent **Claim 34** includes limitations of "wherein said series of beacons is adapted to support at least one of:

marketing, [00543]

social networking, [00242], [00380], [00403], and others

a dating service, [00126], [00240], (Claim 14 as originally submitted)

vehicle to vehicle communication, [00636]

emergency, (1560 of FIG. 11), [00587], [00621], [00630], [00658], and others

locating an individual in one of an emergency condition or a disaster condition, [00587], [00621], [00630], [00658], and others

messaging associated with an emergency, [00587], [00621], [00630], [00658], and others

navigation to direct a user out of a structure during an emergency condition, and [00587], [00621], [00630], [00658], and others

operating within a mass transportation system." [00527], [00528], [00532], and others

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12m. (Applicant's Remarks): Dependent **Claim 35** depends from Independent **Claim 1**.

Dependent **Claim 35** includes limitations of "further comprising a step of:

changing the beacon identifier frequently and dynamically, where the step of changing the beacon identifier frequently and dynamically is accomplished by the user."

Support for the limitations of Dependent **Claim 35** is provided in Paragraph [00212] of the subject application, which states:

"[00212] The task is to provide a solution when the "user" will receive real-time Point Of Interest (POI) or waypoints in the area where he is automatically associate with a located proximity beacons/tags in the area, **the waypoints information can be information that are real-time information updates in real-time and can be changed according to the waypoints and all according to a proximity detection of the RF tags/beacons ID in the area, the information can be used in these example applications**:"

12n. (Applicant's Remarks): Dependent **Claim 36** depends from Independent **Claim 1**.

Dependent **Claim 36** includes limitations of "further comprising a step of:

initiating direct contact between the mobile device and a remote contents, wherein said direct contact is provided by at least one of an Internet, a web site, and a cloud base program."

Support for the limitations is provided in FIG. 1 (element 106) and the associated portion of the Specification found in Col. 17, Line 59 through Col. 18, Line 42 of Parent US Application 12/932,811, issued as US Patent 8,941,485 on January 15, 2015, which states:

"FIG. 1 is illustrates the implementation of the infrastructure of the tags/beacons in a mall application according to an embodiment of the present invention, each of the Bluetooth/Wi-Fi

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tags/beacons (**102**) contain the name of the waypoint (Macy's for example) and the location of the tags/beacons are known and load in a list with the map of the facility (**101**) into the user mobile device (**100**), the list allow matching of the tags/beacons signal (names) (**102**) to the known list loaded with the map (**101**) to determine the proximity to the tag/beacon providing accuracy to less than 1 m the tags/beacons (**102**) can be install in the area in each location designated as way point store/rest room/special sales special location etc. The user can load the map (**101**) at the entrance (**103**) or pre load from the Internet or other lbs or mapping providers, the beacons can be installed also in the parking area (**104**) and with additional sensor to determine existence of the parking car in the parking area can provide the user with parking navigation to empty parking, the user mobile phone (**100**) with loaded local map of the facility (**101**) that contain the local area list of a known Wi-Fi or Bluetooth beacons/tags (**102**) in the area, the mobile phone will use a special indoor navigation application that will allow scanning the exact list of the area RF Wi-Fi or Bluetooth beacons/tags and determine the exact location of the mobile user by proximity to the finding beacons/tag, the tags/beacons (**102**) broadcast there ID that can be the exact name and the exact location name known location on the map, **the mobile device (100) with the tag/beacon name or ID will trigger content delivery from 3rd party over the Internet or cellular or a cloud** (**104**) such providers will now will know the user location and can provide him with the right content additional to the mapping like advertising, sales offer, special deals coupons or other information all trigger by the location determination done by the infrastructure of the tags/beacons, more over it will allow a real time creating of smart shoppers power and real time protected consumer/student/guest/employee environment where a real-time group of real time physically existing people can share like a real "social networking" environment for application. Like "face book" like or create private social environment to include all the exact people in the area/building/cruise ship/mall/store/school close proximity and people that are attached to one of the known list of the local area RF beacons/tags, especially for consumers that can be know now who is in the area and no need for the "poor man" navigation method of the "check-in" to tell the store/consumers that you are here. Now they can know and there is benefit to the user/guest and to the mall/store/hotel/building area owner, the setup of real time physical group can serve as add-on to exiting social network part of (**106**)."

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Conclusions

The Subject Non-Final Office Action was mailed on March 20, 2015. The Examiner established a shortened statutory period of THREE (3) MONTHS from the date of mailing of the Non-Final Office Action. Applicant has responded on or before the actual FOUR (4) MONTH anniversary of Monday, July 20, 2015. Therefore, Applicant believes the response requires a Petition for a ONE (1) MONTH extension and the required petition fee of $100 (Small Entity), both are being submitted herewith.

Applicant earnestly believes the response is complete.

Applicant earnestly believes that no new matter has been introduced.

Thirty-six (36) total claims, including Three (3) Independent claims remain pending in this application. Applicant has previously paid for Twenty-one (21) total claims and Three (3) Independent claims. Therefore Applicant believes the amendment has necessitated an excess claims fee for an additional fifteen (15) claims, each excess claim having an excess claim fee of $40 (Small Entity), for a total excess claims fee of $600 (Small Entity) being due and is current submitted herewith.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant believes the response is filed with the appropriate fees due at this time. However, if any additional fees are required in connection with the filing of this paper, permission is given to charge account number 506593 in the name of Allen D. Hertz, P.A.

Should the Examiner consider necessary or desirable any formal changes anywhere in the specification, claims, and/or drawings, then it is respectfully asked that such changes be made by Examiner's Amendment, if the Examiner feels this would facilitate passage of the case to issuance.

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Respectfully submitted,
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Attachments:
Petition for Extension of Time (One Month)
Petition Fee of $100 (Small Entity)
Excess Claims Fee of $600 for Fifteen (15) Claims over the previously paid quantity
Specification – Annotated (106 Pages)
Specification – Substitute (105 Pages)

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INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

RELATED APPLICATIONS

[0001] This application is:

a Divisional Application of U.S. Patent Application Ser. No. 14/285,209 filed on May 22, 2014,

which is a Divisional Application of U.S. Patent Application Ser. No. 12/930,735 filed on January 14, 2011,

which is a Divisional Application of U.S. Patent Application Ser. No. 11/396,843 filed on April 03, 2006 (now US Patent 7,899,583 on March 01, 2011),

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/670,097 filed on April 12, 2005 (now expired); and

a Divisional Application of pending U.S. Patent Application Ser. No. 13/135,421 filed on July 05, 2011,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/932,811 filed on March 07, 2011,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/587,042 filed on October 01, 2009,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/069,899 filed on February 13, 2008 (issued as US Patent 7,924,149 on April 12, 2011),

which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/472,706 filed on June 22, 2006,

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which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/429,864 filed on May 08, 2006,

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/678,947 filed on May 09, 2005 (now expired),

a Divisional Application of pending U.S. Patent Application Ser. No. 12/587,042 filed on October 01, 2009,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/429,864 filed on May 08, 2006,

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/678,947 filed on May 09, 2005 (now expired).

FIELD OF THE INVENTION

[0002] This invention is directed generally to the field of RF beacons. More specifically, the application of a series of deployed RF beacons creating an infrastructure for use in navigation, marketing, emergency situations, transportation, parking assistance, hospitality applications, and the like, wherein the information is displayed upon a map on a user's cellular phone or similar device.

BACKGROUND OF THE INVENTION

[0003] Introduction to location based services:

[0004] Location based services are rapidly expanding. Outdoor location technologies are mainly based on GPS technologies. GPS cannot perform properly indoors and is therefore inadequate. As a result, indoor location systems are appearing on the market.

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[0005] The need for a system arises from various market segments and applications. One example in the market is the GPS based systems that use integrated positioning and navigation systems based on GPS receivers as the primary positioning technology. Subsequent to the events of September 11th' the Federal government mandated that GPS capability be built in to all cellular phones. However, the fact that uninterrupted satellite reception is not possible in many locations is a major limitation of GPS based systems. Densely populated areas and radio-frequency-signal shadowed locations, such as urban centers (a.k.a. "urban canyons"), generally do not allow proper operation of GPS, yet it is in these locations that the need is greatest.

[0006] There is a clear need for a cost effective system that maintains performance indoors, in urban canyons and in city centers.

[0007] Another important consideration is that GPS itself is susceptible to jamming and other man-made interference.

[0008] Description of GPS System:

[0009] The Global Positioning System (GPS) is a satellite- based navigation and time transfer system developed by the U.S. Department of Defense. GPS serves marine, airborne and terrestrial users in the military as well as civilians. Specifically, GPS includes the Standard Positioning Service (SPS) that pro- vides civilian users with 100 meter accuracy as to the location or position of the user. For military users GPS provides the Precise Positioning Service that is accurate to within 20 meters. Both of these services are available worldwide with no requirement for any local equipment.

[0010] View of GPS limitations:

[0011] First limitation of GPS is that upon activation the GPS receiver scans for signals from the GPS satellites. A unit must locate and receive signals from at least four satellites to be able to determine its location. This process of locating the satellites, receiving the data and achieving a position fix can take several minutes. This delay is problematic for many GPS applications.

[0012] Second limitation of GPS is that the receiver needs a clear view of the sky to successfully receive signals from the satellites, again under unfriendly RF conditions such as

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inside buildings, or in "urban canyons" or in the shadows of high buildings, the GPS suffers from multi-path effects and therefore shows poor performance or none at all.

[0013] Third Limitation-limited accuracy: There is a problem of limited accuracy of the civilian GPS signal. While knowing your position to within 50 to 200 feet anywhere on the planet is a major technological feat, it is still not accurate enough, to locate and navigate to an a store in a mall or to empty parking space, where each space measures about 10 feet, and most indoor store/malls are located where the GPS cannot work effectively.

[0014] Existing navigation systems, such as the new mandatory GPS equipped cellular phones, are based on GPS and have the aforementioned limitations.

[0015] Another significant factor adding to the limitations of the GPS based systems is the important role of map production; normally a user requires a map to be as detailed and as up-to-date as possible. The existing maps used by the GPS based systems provide limited detail and are not able to reflect changes on a real time basis, more over there is no mapping for indoor facilities at all. The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[0016] <u>The Proposed Solutions:</u>

[0017] In general, the subject invention is based on applying machine-learning techniques to the task of inferring aspects of the user's status from a stream of input from Small RF tags/beacons are installed in local area indoor or outdoor or in places designated as Point Of Interest (POI), be it at a mall, department store, product inside a store, street or garage parking, inside or outside location, public or commercial, The tags/beacons can be RFID (long range type), or a Bluetooth with the option to long range Bluetooth, or a Wi-Fi or any RF type. The tags/beacon broadcast a unique ID by wireless that identifies the location by the unique ID, the address and type of facility/store/product. The tag/beacon broadcasts its information to be picked up by the mobile phone application, via the cellular phone or other Bluetooth device with application.

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[0018] The focus of the application for the indoor guide navigation and local based services, or navigation in crowded urban areas, where GPS based systems, due to lack of access to satellites or the GPS limitations detailed previously, cannot achieve the required results.

[0019] The disclosed applications focus on the task of interactively guiding the user to a desired indoor destination.

[0020] Examples of indoor applications:

[0021] The user may wish to locate an empty available parking space in his vicinity.

[0022] The user may wish to locate a specific store in a shopping mall, or a particular aisle in a department store, or a specific item on a shelf.

[0023] The user may wish to locate a specific conference room in a convention center, or a Point Of Interest (POI) in an amusement park or a Point Of Interest (POI) in a museum.

[0024] The user may be looking for a train location in a station, or stops in a subway or underground train system.

PRIOR ART

[0025] At present, however, no prior art device utilizes the capabilities to display a real-time representation of navigating directly from the sensors without a central system; and without using a GPS based system directly to the "user". Also most systems are designed for the old query type search where interface to Internet and or database to a central system is needed

[0026] The navigation system automatically detects a signal directly from the bacon, no communication needed not even cellular communication to do the determination of the location where is other systems must have bandwidth available, over which to send a request to a central system, or to a database, and then must wait for a response. This takes time!

[0027] Even if the other systems have bandwidth, they are still based on the existing search concept where the user submits a query, searches and waits for the response. This is impractical.

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The subject system provides the information automatically, without submitting any query, and the response is according to the user's location, wherein the user's location is determined by proximity to the beacon in the local area.

[0028] Again, most of the existing prior arts are based either on a GPS based system or the existing car navigator, that depends on a GPS too. And the existing mapping that these systems use has the same limitations described previously and is impractical.

[0029] The present invention bridges the gap between the GPS based navigation and provides a complete solution.

[0030] Patent U.S. Pat. No. 7,031,875 Ellenby et al. describe a pointing system for addressing objects, provide a system and method based on GPS and Internet/database communication, it is not exactly a navigation but an information based system that needs the GPS to locate the user location so indoor services is likely out of the questions and the need for communication as well with GPS limits its availability and accuracy.

[0031] The system, as provided by the present invention, determines the location using the beacon/tag ID, Proximity Detection (PD), and Received Signal Strength (RSSI), Time of Arrival (TOA)=and Angle of Arrival (AOA).

[0032] Proximity Detection (PD)

[0033] This method relies upon a dense grid of antennas, each having a well-known position. When a mobile device is detected by a single antenna, it is considered to be collocated with it. When more than one antenna detects the mobile, it is considered to be collocated with the one that receives the strongest signal.

[0034] This method is relatively simple to implement. It can be implemented over different types of physical media. In particular, IR and RFID are based on this method.

[0035] Triangulation

[0036] In case more than one beacon/tag signal a Triangulation takes PD a step further, in the sense that it is based on measuring the signal level measurements from each antenna (possibly by

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using a triangulation mechanism), with respect to each mobile device. Following that, mobile is located by using a triangulation algorithm.

[0037] Like the PD method, triangulation is relatively simple to implement.

[0038] Time of arrival (TOA)

[0039] Time of arrival (TOA)is based on triggering the mobile devices to respond, and measuring the time it takes for the response to fly back to the antenna. The elapsed time represents the distance between the two. By using distances from a few antennas, a mobile's position can be triangulated. TOA is considered to be the most accurate method, because multi-path effects can be filtered out. Yet, it is considerably more complex to implement, as it requires a modification to the hardware on the mobile side, as well as special modifications on the antenna side.

[0040] Angle of Arrival (AOA)

[0041] Angle of Arrival (AOA) is based on finding the direction of maximal signal intensity for each antenna-device pair. By finding the intersection of several such direction vectors, a mobile's position can be estimated AOA is considerably less accurate than TOA, due to limited angular resolution and the fact that indoors much of the signal is reflected. Also, AOA antennas are more complex, as they require multi-section, highly directional antennas, and multiple RF circuitries.

[0042] Bluetooth is a newer wireless local networking standard that operates in the 2.4 GHz ISM band. and the range is shorter (typically 10-15m, although there are tags with a range of over 300 feet). On the other hand, Bluetooth is a "lighter" standard, highly ubiquitous (embedded in most phones, PDAs, PC peripherals, etc.) and supports, in addition to IP, several other networking services. Notably, Bluetooth supports serial port emulation, voice, and various types of object exchange. Bluetooth tag/beacons are small, pocketsize transceivers.

[0043] Every Bluetooth device's tag/beacon has a unique ID. This ID can be used for locating the tag/beacon and providing location information of the mobile device in the proximity.

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[0044] The relevant location scenario of the present invention is that of searching for a certain tag. It is the most accurate and the faster response time and it is this method in indoor navigation and locating when and where each tag/beacon ID is a known address position-waypoint.

[0045] Why use Bluetooth for indoor location?

[0046] Bluetooth has some advantages in the context of indoor location. These include:

[0047] Bluetooth uses RF-in the 2.4 GHz ISM band, specifically. In this frequency range, radio waves penetrate obstacles, such as walls and human bodies, albeit with a substantial loss.

[0048] This has two implications:

[0049] Availability of a "high-there" application is always some signal received from the tags/beacons.

[0050] Tags/beacons can be placed relatively far apart (typical range is 10-15 meters, i.e. not necessarily of one in each way point).

[0051] Bluetooth is ubiquitous-Bluetooth chipsets are being implanted everywhere nowadays (phones, accessories, computing devices, etc), the tags/beacon can be implements anywhere, inside buildings roads inside cars transportation entities, inside home for home automation triggering, or in any kind of business triggering application or and link to exiting system .

[0052] The fact that a Bluetooth location system can locate any Bluetooth enabled device, makes it more cost-effective. This means that an increasing fraction of humans and mobile assets around would become locatable in a Bluetooth covered site, with no additional hardware cost (no tags/beacons attached). The only need is to pre-register these devices. Bluetooth is a low power technology-tags need recharge, approx. once a week (or longer, depends on the usage scenario). Non-tags (e.g. BT enabled phones) are being recharged anyway on a regular basis, so they do not need special recharges. If they are being used for location, the fraction added to their usual (no Bluetooth) power consumption is relatively small.

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[0053] Bluetooth is a low cost technology, having expected high production volumes (hundreds of millions annually) lead to sub-$5 per chip. It is noted that several IC manufacturers have already met this goal. This would eventually result in a low price for the Bluetooth tags/beacons, if and when Bluetooth location systems would become sufficiently ubiquitous. Bluetooth is a multi-functional communication standard - location is only one of the services that can be supported by a Bluetooth infrastructure. The same infrastructure can be used to provide additional network services, particularly remote monitoring and control or just trigger link to exiting system. In addition, Bluetooth provides voice and IP services (although for the later, WLAN is typically more suitable).

[0054] In open spaces, relatively free of obstructions and walls (e.g. a large warehouse or a public hotspot), Bluetooth alone would suffice to provide a -2 meter error range.

[0055] Conclusions

[0056] The proposed beacon technology offers unique advantages: one is the ability to locate ubiquitous "any tags" (any Bluetooth enabled device can be associate and be use the advantage of the Bluetooth beacons, e.g. most of the newer mobile phones). The other advantage is the multiservice nature of the Bluetooth beacons infrastructure that enables using the tags/beacons for other purposes, such as for locating and navigating, remote monitoring and control, trigger existence and link to existing systems and software and for a variety of local based services and local push messaging services.

SUMMARY OF THE INVENTION

[0057] In accordance with the present invention, these are the navigation project's characteristics:

[0058] The proposed system is a locating and navigation method based on the following unique characteristics:

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[0059] In an indoor or outdoor navigation situation the RF beacons tags, replace the satellite in a GPS based system, to provide the user with the information and directions needed to reach the destination.

[0060] The proposed system has three major parts:

[0061] The detection and navigator, the special method used to display the data and the information from the area trigger as result of being in close proximity to the RF beacons in the area.

[0062] It is not a location and tracking system as offered by other systems.

[0063] Small RF tags/beacons are installed in each place designated as Point Of Interest (POI), be it at a mall, department store, product inside a store, street or garage parking, inside or outside location, public or commercial. The tags/beacons can be RFID (long range type), or a Bluetooth with the option to long range Bluetooth, or a Wi-Fi or any RF type. The tags/beacon broadcast a unique ID by wireless that identifies the location by the unique ID, the address and type of facility/store/product . The tag/beacon broadcasts its information to be picked up by the mobile phone application navigator, via the cellular phone or other Bluetooth device with application, the beacon ID trigger application and push information to the Bluetooth device or the cellular phone with the Bluetooth.

[0064] The system can serve as add on to the mall's/store's guide/mapping to provide extra assistance to user.

[0065] The navigator.

[0066] The navigator, cellular phone application Bluetooth application

[0067] The user device scan the local area for ID broadcast by the tags/beacons in the vicinity via the wireless Bluetooth interface with a cellular telephone utilizing the cellular phone's Bluetooth capability. It is important to note that no cellular communication or Internet or database access is needed to determine the location of the device and that any Bluetooth enabled device will operate the navigation application as a stand-alone device. The beacon system can interface with existing in car system and/or car navigation system.

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[0068] The display method.

[0069] The display method is a unique way to bridge existing devices like cellular phones, in-car system and in-car navigation and other Bluetooth devices. The system provides an overlay display method over the existing navigation system mapping or floor map or floor images, as a real-time floating display, or as a waypoint to overcome the limitations of GPS based systems and the existing mapping systems, the indicator placed overlay on the floor plan image, it may further include providing a visual indication a circle on the floor plan image of the path, wherein the visual indication – the circle indicates an area of the indoor map where the location information identifies a particular location and the circle provides the accuracy radius circle.

[0070] The mapping: a system and method for mapping an indoor environment is provided. a user device may receive an indication of a starting point on a floor plan.

[0071] The user device may prompt the user to travel in a particular direction, or the direction of travel may be determined by the user device in response to the user indicating a second location after the user has traveled to the second location.

[0072] As the user travels from the starting point in the designated direction, the user device may gather information about the indoor environment. For example, the user device may gather wireless signal strength data, from proximity RF beacons Wi-Fi or Bluetooth while the user travels in the designated direction.

[0073] The user device may associate the gathered information with the path the user traveled from the starting point to the ending point. The operation can be done at the user device – the cellular handheld, the association may also be performed by a remote server using data provided by the user device. As the user travels from point to point, the client device may indicate the area for which valid location information is available based on the path the user traveled and the information the user collected.

[0074] The Mapping can be offered as an additional service for the indoor based on area building floor or image mapping.

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[0075] The navigation system will enable remote planning based on downloaded local floor-plans the floor mapping or floor images – the indoor view images of the local building facility, or local navigation, when the location's floor plan can be triggered to down- loaded at the destination. An example of this would be at the entrance of a shopping mall, a department store, an amusement park, a museum, a parking garage, a downtown area of a city, and the like.

[0076] The navigation system is based on a network of tags/beacons that can be deployed anywhere. The system is accurate to within 10 feet, significantly better existing navigation systems and GPS. The system can work inside a building whereas GPS cannot.

[0077] Local detection is obtained via popular Bluetooth interface.

[0078] The system provides information about each facility/store, including information about the type of the facility, for example: type of store or product etc.

[0079] By providing the ability to locate a the user in an area using a Bluetooth enabled device, or a cellular phone with the navigation application and the RF beacons method, the system overcomes the anxiety of "Where am I "and also facilitates finding a parked car later via the RTP (Return to Parking) feature.

[0080] The system has the capability to perform all the functions of a search for and can become the "Next generation search out of the box".

[0081] The navigation system can be attractive for places that already deploy WI-FI and can be used for the existing WI-FI devices as a tags/beacons.

[0082] In case of an emergency or security situation, the system can provide authorities with information.

[0083] The system eases and facilitates navigation to indoor locations, without a navigation map or GPS. Indoor Mapping can be provided as part of the navigation system. The system provides "local" navigation as well as "remote" detection.

[0084] The system allows easy interface or trigger application with existing networks or existing system.

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[0085] The system saves gas, time, money and eases global warming by reducing the time spent searching for destination.

[0086] The navigation method is unique. The navigation system is based upon RF tags/beacons with interface to Bluetooth enabled devices. This feature allows detection and navigation in locations where GPS cannot work, as well as outside, with the ability to guide the user to within 10 feet of the destination, significantly better than any other navigation and GPS based systems on the market.

[0087] The Bluetooth RF tags/beacons are based on a long-range version of the popular short distance communication. This unique feature affords the user the ability to plan ahead from a remote location, by obtaining ID about the destination directly from the tags/beacons and by accessing the indoor floor plan to be navigated at the destination.

[0088] A major problem with In-Car navigation and GPS mapping is that they cannot guide the user closer than 50 to 200 feet, and only in open places. The navigation system can provide accurate directions to within 10 feet.

[0089] The navigation system will be a challenge to navigation providers and GPS providers as they cannot provide mapping or navigation inside a mall, department store, a parking garage or lot, and anywhere the GPS /Navigation map cannot accurately help navigate.

[0090] Utilizing this innovation, the facilities in the vicinity around the "user" car are displayed on a floating overlay using either a cellular phone application, or a stand-alone device, or an existing installed navigation system with or without any mapping.

[0091] The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[0092] Navigation using the mapping or floor plan of a location can be offered as a part of the system. The option of downloading a floor plan can be exercised either remotely or locally.

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[0093] The tags/beacons broadcast their signal continuously and any of the navigation devices will detect them and display the ID/data on the user's device in an easy to understand method.

[0094] With our innovation you have the information that you want, when you want it, where you want it ...(and at an affordable price)

[0095] Once you are in the vicinity of your destination and you switch on your navigation device, by being in proximity to installed beacons in the area you will automatically receive the facility information along your waking route and in all directions around you.

[0096] No further action is required, there is no need to send a request or to access the Internet/web or log on and search a database or central system the access to the Internet is to provide a local based services like push information or messages or offers, deals, advertising to the mobile user .

[0097] Other systems are still based on the existing search concept where the user submits a query, searches and awaits for the response. All impractical while the user needs the information immediately. The navigation system provides the information automatically, without submitting any query, and the response takes into account the user's location determined by the proximity RF beacons.

[0098] The unique approach to detection of the mobile inside the buildings does not need an Internet bandwidth or cellular communication. The Internet or cellular communication provides local based services and additional information that can be pushed to the user device.

[0099] And as a result there is no delay or waiting for communication and access time, the communication is instantaneous, triggered directly between the tags/beacons ID and the user's device.

[00100] Additionally, each facility type can be ID coded to identify the type of the store etc., e.g. restaurants, men's wear, women's wear etc.

[00101] Each ID-coded display of facility can be trigger accessed to information about the store e.g., providing automatic waypoint information.

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[00102] The ability to operate the innovation using the disclosed applications on a cellular phone, the navigator, with no need for cellular connection to determine the current location, means the user does not need any GPS system.

[00103] Moreover, the navigation system can solve the "RTP" (Return to parking) problem, where many forget where they parked their car. The system has an option to save the location on the "cellular phone-parking detector" application that will make it easy to locate the parked car.

[00104] The navigation solution is designed for global use and is not limited to malls, stores, amusement parks, museums, sports stadiums etc. It can be implemented in parking garages or parking spaces metered or not, the tags/beacons can be implemented anywhere and in any place to trigger and initiate existing and local application and even link to exiting system and existing software.

[00105] It is envisioned that in the future all new construction will have the tags/beacons included in the design, even place addresses, a building addresses can be replaced or use an add-on with the implementation of a tags/beacon in the area to be recognized or scanned by the mobile device.

[00106] The system integrates the navigation as part of the NAV4 concepts where it will provide complete solutions for local navigation in an area where the GPS can't work.

[00107] The navigation system consists of the following parts:

[00108] An infrastructure of tags/beacons, wherein each tag/beacon is installed in a local and known location.

[00109] The navigation system is based on mapping and navigation to and in the location, and its aim is to replace or supplement the mall/store guide/map, by installing the tags/beacons in each store or Point Of Interest (POI).

[00110] The mapping: As GPS and GPS mapping is not available indoors, the navigation system is based upon the floor plan mapping or floor images available from each facility. For planning ahead, the floor plan or the floor images can be downloaded as part of user's

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navigation/cellular phone remotely-via Internet as mobile application before reaching the destination or triggered when the destination is reached.

[00111] The Navigation uses the most commonly used device in the world today, the cellular phone with Bluetooth interface.

[00112] As a difference from other systems and other local based systems, this solution offers a unique approach that can be described as the "Search out of the box" as neither query nor database search is needed; all needed is to know the proximity tags/beacons ID and the cellular phone, working as a Bluetooth device, that automatically scans and recognizes the local area tags/beacons and determines the "user's" location, and provides instant information to the user and to the business in the area.

[00113] A typical application is guide and navigating a pedestrian in an environment like a mall, department store, specialty store, conference, trade show, amusement park, university, hospital, school, municipal building, museum, subway, train station, airport, down town center, a finance facility, cruise ship and any type of parking facility ...or any place when and where GPS cannot be provided or is not accurate or precise enough. The system will be used for navigation by first responders to emergencies or disasters.

[00114] The navigation system is part of the broad suite of applications that include a complete solution to the "user" from the time that he parks, or begins looking for a space to park his car, walking to the store/mall or to any indoor facility to when he wants to return to his parked car, looking for the place that he parked.

[00115] The suite may includes:

[00116] Parking detector-and navigation to the empty available parking space.

[00117] Automatic notification of user existence in the place/store/facility

[00118] Nav4 mall/store navigation solution inside mall/store.

[00119] RTP-return to parking-locate the place that you parked your car.

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[00120] For example, a typical application could be:

[00121] A pedestrian asks the way in a mall to a specific store.

[00122] A pedestrian asks the way inside the store, to a specific aisle or product.

[00123] A shopper in a department store asks for a specific department.

[00124] A pedestrian asks the way to a Point Of Interest (POI). In an emergency, the first response team has to navigate inside a smoke filled building.

[00125] A store owner can use the notification and the knowledge of existence for loyalty and rewards

[00126] The beacons ID can trigger a link to exiting software and aware the local system of the user existence – such as:

A traveler is check in into a hotel/resort, the hotel/resort can provides with automatic check-in and interface to the hotel/resort front system.

A traveler is check-in into a flight in the airport, the airline provides the traveler with automatic check in to the flight when the traveler reach close proximity to a RF local beacon.

A customer are check into a restaurant or food service, the business will recognize the customer when he in proximity to the local RF beacon.

The pedestrian reach an advertising area or billboard that can recognize the user by being in a close proximity to the advertising area and provide the user with customize personalize advertising or offer.

A customer is entering a store/bank/facility front would be identified/recognized for additional information or services.

The RF beacons/tags can serve to track employee time, including check-in and checkout times from designate area.

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~~The RF beacons/tags can serve as part of payment process where the user mobile and the local proximity beacons/tags can provide additional security for a mobile payment system to replace a current payment method such as those using credit cards.~~

The local RF beacons associate with the user mobile can be part of local dating system.

The local RF beacons with associate with the user mobile can create virtual secure zone for child or elderly or any care monitoring.

The location of the user as associate with the local beacons can be interface with social networking .

The RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking.

The RF beacon can be installed or be a part of a vehicle to provide car application like payments security car broadcasting car tracking car communication and automatic car counting to provide transportation managements with statistically information automatically.

[00127] A system and method to provide a user information which is related to the Point Of Interest (POI), the navigation system provides detection and navigation reference, position determination and information related to the object-Point Of Interest (POI), directly and automatically to the user interface-cellular phone upon arriving to a close proximity to the RF tags/beacons installed in the area.

[00128] Special operation mode: Shopping: provides navigation to the special sale item in a department store.

[00129] Special operating mode: Museums: provides navigation and interactive information from the museum's exhibition to the "user's" cellular phone device via Bluetooth interface.

[00130] Special operating mode: Parking: describe in 2 patent applications, provide empty parking space detection and navigation.

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[00131] Special operating mode: Nav store provides navigation inside a store/department store to a specific department/aisle or specific product, with an option for advertising method and special promotion it also provides the business owner with ability to know, in a way of automatic notification when the "user" cellular phone device is in proximity to the local area for automatic delivery of information related to the store/business owner such information can be but is not limited to deals, coupons, special and even statistically information about the "user" habit.

[00132] Every Bluetooth device's tag/beacon has a unique ID. This ID can be used for locating the tag/beacon and providing location information of the mobile device in the proximity.

[00133] A relevant location scenario is that of searching for a certain tag. The relevant location scenario is the most accurate and the faster response time and is one solution for indoor navigation and locating when and where each tag/beacon ID is a known address position-waypoint.

[00134] Why use Bluetooth for indoor location?

[00135] Bluetooth has some advantages in the context of indoor location. These include:

[00136] Bluetooth uses RF-in the 2.4 GHz ISM band, specifically. In this frequency range, radio waves penetrate obstacles, such as walls and human bodies, albeit with a substantial loss.

[00137] This has two implications:

[00138] Availability of a "high-there" application based upon receipt of a signal from the tags/beacons.

[00139] Tags/beacons can be placed relatively far apart (typical range is 10-15 meters, i.e. not necessarily of one in each way point).

[00140] Bluetooth is ubiquitous-Bluetooth chipsets are being implanted everywhere nowadays (phones, accessories, computing devices, etc), the tags/beacon can be implements anywhere, inside buildings roads inside cars transportation entities, inside home for home automation triggering, or in any kind of business triggering application or and link to exiting system.

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[00141] The fact that a Bluetooth location system can locate any Bluetooth enabled device, makes it more cost-effective. This means that an increasing fraction of humans and mobile assets around would become locatable in a Bluetooth covered site, with no additional hardware cost (no tags/beacons attached). The only need is to pre-register these devices. Bluetooth is a low power technology-tags need recharge, approx. once a week (or longer, depends on the usage scenario). Non-tags (e.g. BT enabled phones) are being recharged anyway on a regular basis, so they do not need special recharges. If they are being used for location, the fraction added to their usual (no Bluetooth) power consumption is relatively small.

[00142] Bluetooth is a low cost technology anticipating high production volumes (hundreds of millions annually) leading to sub-$5 per chip. Several IC manufactured have already met this goal. This would eventually result in a low price for the Bluetooth tags/beacons, if and when Bluetooth location systems would become sufficiently ubiquitous. Bluetooth is a multi-functional communication standard - location is only one of the services that can be supported by a Bluetooth infrastructure. The same infrastructure can be used to provide additional network services, particularly remote monitoring and control or just trigger link to exiting system. In addition, Bluetooth provides voice and IP services (although for the later, WLAN is typically more suitable).

[00143] In open spaces, relatively free of obstructions and walls (e.g. a large warehouse or a public hotspot), Bluetooth alone would suffice to provide a -2 meter error range.

[00144] Waypoint Navigation

[00145] A waypoint is a fixed location with known address location, longitude and latitude and coordinates. The navigation system is capable of storing a database of waypoints for the following purpose:

[00146] Waypoints mark a destination, a point along the way to a destination, or a point of reference. Normally, in navigating, a "route" consists of one or more waypoints. To traverse a route, the user navigates to the nearest waypoint, then to the next one in turn until the destination is reached. The system has the ability to compute a great-circle route towards a waypoint, enabling them to find the shortest route even over long distances. The system enables users to

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locate a destination on a map or indoor floor plan or indoor image and define it as a waypoint. The system is intended for navigation; it can generate a suggested route between two waypoints, based on the cartographic database. The system indicates the user's current location and gives advance notice of an upcoming point.

[00147] Because the system knows the waypoint positions, and the distance between them, it is easy to determine the "user's" exact location.

[00148] Map Matching

[00149] The navigation solution is further enhanced, although it is not essential, when the system knows that the person or object being located is traveling along known routes on a map; for example, the system can assume that people can only follow certain routes in a mall. This is priority information that can be used to "force" the estimated position to be on the nearest point on the possible routes, note that it is easier to predict indoor than outdoor.

[00150] The constraints of indoor construction similarly can be used to refine estimates of the position of a person or object moving within a building-people and objects do not pass through walls, they pass along corridors and through doorways. It is a best solution for a system in case of an emergency or for a system for homeland security or a system to locate and inform the subway location, a good example is the hotel exit floor map.

[00151] Configuration and Use

[00152] In the indoor application, instead of GPS, the system uses known waypoint positions that are manually detected and identified as a demonstration of the concept of using another sensing method, such as RF tags/beacon, to detect and identify the location and the waypoints. Theoretically, it would be possible to convert the waypoint positions into GPS coordinates and emulate an external GPS data source.

[00153] This system can be useful for providing navigation to first responder personnel indoors waypoints have been installed in a particular building in the form of RF tags/beacons whose identities are associated with locations- the meaning of identifier, it may be possible to associate magnetic anomaly information with individual tags as well.

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[00154] One of the important features of the indoor navigation techniques will enhance the ability of tactical team's first response team to navigate within the buildings in which it has been deployed. RF (Bluetooth) Tag/bacon devices commonly are attached to persons or to moveable objects, so that the objects can be tracked using fixed readers (special- purpose radios) at different locations. This is the most common indoor navigation that exists today.

[00155] The navigation method is the "flip side" of this practice and is based on the concept that the detection of an RF (Bluetooth) device, or RF Tags/beacon, in a known, fixed location, by a moving reader, such as a Bluetooth enabled cellular phone or other Bluetooth enabled device, provides a precise location of a person or a moving object, by the carrier of the telephone or device, who can supply indoor navigation without GPS.

[00156] The navigation method provides a low-cost, reliable system for firefighters and other first responders, inside buildings, to navigate, where a GPS is not reliable-indeed, the GPS signal may have been disabled temporarily to prevent-exploitation by terrorists, or even more likely no signal can be received at all inside a building.

[00157] The navigation system foresees this limitation of GPS based systems, and is intended for an environment that is potentially much less "friendly" to RF signals, the environment inside a building that first responders encounter may contain smoke, dust, or flames, and is intended to leverage advances in RF/Bluetooth tag/beacon technology. The navigation system will exploit the capability of storing critical building information, such as the floor maps and the emergency escape plans, for retrieval and navigational assistance via a Bluetooth enabled cellular phone, when and where it is needed,

[00158] Moreover the navigation system can serve as a navigator for the emergency exit route when and where needed. Each user can load the emergency exit floor plan and escape with the knowledge of his exact location in that route.

[00159] Aspects of the scenarios to be included:

[00160] Identifies and tracks the user (a first response team member)option to use the cellular phone as a beacon by himself.

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[00161] Provides the user with navigation information and directions for safely exiting the building.

[00162] Provides location information of all team members, via an ad hoc network of radio terminals that combine RF/Bluetooth and allow communication chat and messaging between the team members without need for Internet or cell communication such option is not limit to the first response team but to a user in emergency and non-emergency use.

[00163] From the outset, the navigation system was designed with the capability to utilize existing technology so it can be deployed as a stand-alone system, or in tandem a link with existing systems. The system focuses on employing technology that is already in place that simply needs to be expanded.

[00164] With the implementation of the navigation system, a FIRST RESPONSE TEAM will be empowered to navigate and find its way in a case of emergency or a disaster. This capability can be a critical life-saving power in modem congested urban living conditions, not available before now.

[00165] It is believed that the implementation of the navigation system will assist counter-terrorism activities and more importantly will help the first response teams to save the lives of people trapped inside buildings.

[00166] Conclusion

[00167] The Bluetooth technology offers few unique advantages: one is the ability to scan and locate a small tag/beacon installed in an local area using the tags/beacon ID a low cost and battery power and low battery use and the use of the newest Bluetooth devices (any Bluetooth enabled device that is not a tag/beacon, e.g. most of the newer mobile phones) can be used as a tag/beacon.

[00168] The other advantage is the multiservice nature of the Bluetooth infrastructure that enables using the tags/beacons for other purposes, such as for navigating, remote monitoring and control, a triggering mechanism to application and system even a link to existing systems and for a variety of messaging a push information and local based services.

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[00169] Location based services are rapidly expanding. Outdoor location technologies are mainly based on GPS technologies. GPS cannot perform properly indoors, and is therefore inadequate. As a result, indoor location systems are appearing on the market.

[00170] The need for a system arises from various market segments and applications. One example in the market is the GPS based systems that use integrated positioning and navigation systems based on GPS receivers as the primary positioning technology. Subsequent to the events of September 11th' the Federal government mandated that GPS capability be built in to all cellular phones.

[00171] However, the fact that uninterrupted satellite reception is not possible in many locations is a major limitation of GPS based systems. Densely populated areas and radio-frequency-signal shadowed locations, such as urban centers (a.k.a. "urban canyons"), generally do not allow proper operation of GPS, yet it is in these locations that the need is greatest.

[00172] There is a clear need for a cost effective system that maintains performance indoors, in urban canyons and in city centers.

[00173] The disclosed application includes finding a solution to this task by providing a system and method to generate automatically the waypoint along the user route ether indoor, or outdoor.

[00174] The disclosed application addresses the task of interactively guiding the user to a desired indoor and outdoor destination.

[00175] The method for mapping an indoor environment is provided. A user device may receive an indication of a starting point on a floor plan. The user device may prompt the user to travel in a particular direction, or the direction of travel may be determined by the user device in response to the user indicating a second location after the user has traveled to the second location.

[00176] As the user travels from the starting point in the designated direction, the user device may gather information about the indoor environment. For example, the user device may gather

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wireless signal strength data, from proximity RF beacons Wi-Fi or Bluetooth while the user travels in the designated direction.

[00177] The user device may associate the gathered information with the path the user traveled from the starting point to the ending point. The operation can be done at the user device – the cellular handheld, the association may also be performed by a remote server using data provided by the user device.

[00178] As the user travels from point to point, the user's device may indicate the area for which valid location information is available based on the path the user traveled and the information the user collected.

[00179] The method may include displaying a floor plan image or floor mapping or the floor indoor view – the floor images corresponding to an indoor location, receiving a first input to indicate a first location on the floor plan image, gathering initial location information at the first location, and generating an indoor map, using a processor, using the initial location information wherein the indoor map includes an association of the initial location information with the first location.

[00180] The method may further include repeating the location information gathering process at a new location to associate new location information with the new location in the indoor map.

[00181] The method may include gathering additional location information as the user travels from the first location to a second location, receiving a second input to indicate the second location on the floor plan image, determining a path from the first location to the second location, and associating the additional location information with at least one location within the map corresponding to the path.

[00182] The method may include prompting the user to walk in a straight line when traveling from the first location to the second location.

[00183] The method may include providing instructions to a user to travel in a particular direction. The location information may be wireless signal data associated with one or more RF

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wireless beacons installed in the local area. The first input may include performing a selection operation with an indicator placed on the floor plan image.

[00184] The method may also include providing a visual indication on the floor plan image of the path. The visual indication may indicate an area of the indoor map where the location information identifies a particular location. The building floor plan may be received from a remote via Internet or cellular communication as part of the mapping and navigation application.

[00185] The method may also include determining an approximate location determine by proximity to the RF beacons, providing the approximate location to the remote server, receiving a list of floor plans associated with indoor environments proximate to the approximate location, and selecting the building floor plan from the list.. The method may include identifying the user's direction of travel by at least one of determining a relative orientation using the first location and the second location, or using at least one of an user device built-in sensors, accelerometer, a gyroscope, or a compass.

[00186] The method may include determining a location precision for the data gathering operation, and using the location precision to determine a location resolution for the indoor map. The location precision may be determined using a number of available RF wireless beacons for which signal strength data and the beacons ID are available. The location precision may determine at least one of the size of an indicator for indicating the current location or the accuracy radius circle, or the width of a stripe for indicating an area of the indoor map for which the location information has been gathered and will display overly on the floor map image map building map. The method may include determining a coverage level of the indoor map compared to the floor plan images.

[00187] The navigation system and method automatically updates waypoints, when each Point Of Interest (POI) will have an RF tag/beacon that will broadcast an RF ID signal that will provide an instant detection, the navigation system will execute the specified file/program that will trigger automatically, executing a waypoint generation program.

[00188] For some years, local governments in cooperation with various FM radio stations and recently a navigation system have been putting together an automated way to get real-time traffic

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data into cars so drivers can avoid traffic. Real time traffic information includes news such as: congestion, construction, traffic accidents, recommended alternative routes, recent navigation systems depend on fix sensors or camera and some navigation on manual information provided by the users/drivers.

[00189] A tag/beacon will be installed at the location or at each Point Of Interest (POI). The tag/sensor will broadcast RF signal contain ID to be recognized by the mobile phone and such information (the RF beacon ID) will transfer automatically via the user mobile phone to the provided location detection of the user as well as statistically information about the possible "traffic" in the area/road, such method can be extremely helpful to manage and control transportation system.

[00190] The "user" will no longer need to enter his way- points manually and then wait for the providers of maps or GPS to update their maps with the information (this can take about a year in some cases). This way the "user" will receive the information that he needs when he needs it and where he needs it upon entering an area with tags/beacons, providing an automatic "check-in" to the user and the facility business.

[00191] Again, no communication is need to be established between the tags/ beacon and the user mobile device and the detection can be done without any communication at all, In the event that more information is required it may be necessary to connect to the Internet website.

[00192] It is believed that sooner or later it will be a standard procedure to install a tag/sensor on every location of interest (waypoint) or any place on road indoor and even outdoor or any business will provide waypoint information to the "users". Most stores or POI/waypoints will be willing to pay for a tag/beacon or pay subscription fee to be on the mapping system on the local area that will show their location and information on a map. Or they will pay for an annual listing (similar to the yellow pages).

[00193] The System can interface with existing GPS mapping outdoors as well as indoors, it can switch automatically where the user outdoor to receive an outdoor map and information based on GPS and when in the indoor to receive an indoor mapping and indoor navigation based on RF beacons detections.

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[00194] Presently GPS providers, map providers and search engines provide: City Navigator and Metro Guide Maps that contain many thousands of attractions.

[00195] These include: Food and Lodging, Attractions, Entertainment, Shopping, Services, Transportation, Emergency, and Government offices. In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be very old and the information associated with them is not update. Listed Attractions include theme parks, museums, libraries, schools, parks and such. This feature is very useful in an unfamiliar area.

[00196] Waypoints will be located automatically in the local area and plotted on the map screen. The waypoints can be stored on the local map at the handheld phone for future access.

[00197] The navigation system will revolutionize the GPS based systems and the mapping industry, from GPS, mapping companies' communication providers, car manufacturers to yellow pages and local guides; for the first time the user of a GPS navigation system will have an easy, reliable way to reach a destination inside buildings facilities – the indoor world.

[00198] The most common problem with today's GPS based systems is indoors where the navigation and mapping is not existing. The navigation system provides the solution for this problem. Using the navigation system, the user will know where he is, be able to identify "landmarks" around him accurately, and receive automatic updates directly from the Points Of Interest (POI) in the vicinity that get automatic notifications about his presence in their area.

[00199] The navigation system is based on RF tag/beacons, each tag or waypoints has its own ID (identifying the waypoint by type, address, etc.). The beacon will broadcast, via RF the ID to be scan and pickup by the Bluetooth device, provides a detection and trigger a location determination as a floating information display on the indoor map referenced to the user's location. The floating display will provide automatic waypoint updates around the local area and will allow the user to search local providers (waypoints/store), even without any connections, no communication, Internet, or cellular is needed to determine the location as well as accuracy radius circle. The Internet web communication provides more information such as push

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notification and messaging and local based services such as deals, advertising directly and automatically to the user's mobile phone.

[00200] Once you are in the vicinity of your destination and, a notification is sent automatically to the business Internet or web site and you will automatically receive the facility information along your waking route and in all directions around you .

[00201] No further action is required, there is no need to send a request or to access and search a database or central system.

[00202] Other systems must send a request to a central system, or to a database, and then must wait for a response. This takes time!

[00203] The disclosed unique approach results in no delay or waiting for communication or authentication and access time as there is no real communication between the tags/beacons and the user mobile device, the result are instantaneous association, directly between the tags/beacons and the user's mobile or navigation device

[00204] The RF tags/beacons broadcast their ID to be scanned and pickup by the user's mobile phone to identify the location of the user as proximity to the tags/beacon.

[00205] Additionally, the ID identifies the type of facility, store etc., e.g. restaurants, men's wear, women's wear etc. and the location in the store, e.g. front, back etc.

[00206] Each facility can provide information about the store e.g., automatic waypoint information as the user's presence triggers initiates automatically notifies the business or waypoint in the local area.

[00207] Do to the limitation of the mapping system currently used by the GPS navigation system the associated display method is our unique way to bridge existing devices like cellular phones, in-car navigation and other Bluetooth devices. The system provides an associated overlay navigation display method as a real-time floating display, or as a waypoint to overcome the limitations of GPS based systems and the existing mapping systems; especially indoors where each waypoint will be displayed over mapping or floor map images.

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[00208] The display method is one unique way to bridge existing devices like cellular phones, as a real-time floating overlay on a directional circular display to overcome the limitations of GPS based systems and the existing mapping systems.

[00209] The overlay add-up device/display works like a VOR and provides add-up display shows automatically the user location in the immediate area in a circle represent a radius of accuracy and proximity distance from the local detect beacon/tag.

[00210] The overlay displays over an existing navigation system, portable device or cellular phone without GPS support providing a circle that shown the location accuracy of the user on the local map.

[00211] The fact is: no digital maps are entirely accurate. A user needs to know which map makers are used by the product that they are interested in and check the maps for the area that they are concerned about. In addition some map databases are created from vector data while others are just scanned copies of paper maps. In addition to mapping data these same map makers can often provide Points Of Interest (POI) data. However, a software company might use the maps from one company and the poi data from another. POI data normally takes three forms. One is public buildings, parks, airports, and possibly geographic objects. A second is government locations that include specialized points lists like marker buoys, and airplane markers. Finally, there are commercial establishments that usually include some information about their product and contact data. Note that the location of commercial places is often derived from the street address and is not based on the actual lat/Ion location. Moreover there is the sky-high cost of digitizing and updating the poi and the waypoints.

[00212] The task is to provide a solution when the "user" will receive real-time Point Of Interest (POI) or waypoints in the area where he is automatically associate with a located proximity beacons/tags in the area, the waypoints information can be information that are real-time information updates in real-time and can be changed according to the waypoints and all according to a proximity detection of the RF tags/beacons ID in the area, the information can be used in these example applications:

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[00213] The user may wish to locate an empty available parking space in his vicinity. Just think of the empty parking spaces as waypoints the parking space occupied with RF beacon and sensor to find if the parking is empty, and the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details with US Patent 7,899,583 (included in the claim of priority and issued to the Applicant and incorporated herein by reference).

[00214] The user may wish to see and locate the real estate property available in his area according to his location, where an RF beacon can be installed in each real estate property to trigger more information to the user/ possible client when he reach proximity to the property.

[00215] The user may wish to locate a specific store in a shopping mall, each store in a mall is a waypoint, or a particular aisle in a department store, or a specific item on a shelf.

[00216] The user may wish to locate a specific conference room in a convention center, or a Point Of Interest (POI) in an amusement park or a Point Of Interest (POI) in a museum.

[00217] The user may wish to find the emergency exit route in a time of emergency or the first response team needs to navigate in a facility in an emergency situation.

[00218] The user may be looking for a train location in a station, or stops in a subway or underground train system. All of that is updated waypoints in real-time.

[00219] It is believed that the automatic waypoint updates revolutionize the GPS and Navigation Industry.

[00220] For the first time the user will know what he wants and when he wants and according to his location

[00221] The local business owner can introduce his content in real-time to the (navigation) users in his area automatically when the user access or enter to his store the contents can be deals, coupons, specials and provides more information to user about the business, the business in turn can benefit from statistically information about the client/s. such as habits, profile, loyalty and rewards.

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[00222] The GPS and navigation industry can tap to the huge local advertising market (estimated at 134B in US alone ...)

[00223] Automatic notification of user existence in the place/store/facility

[00224] Mall/store navigation solution inside mall/store.

[00225] RTP-return to parking-locate the place that you parked your car.

[00226] For example, a typical application could be:

[00227] A pedestrian asks the way in a mall to a specific store.

[00228] A pedestrian asks the way inside the store, to a specific aisle or product.

[00229] A shopper in a department store asks for a specific department.

[00230] A pedestrian asks the way to a Point Of Interest (POI). In an emergency, the first response team has to navigate inside a smoke filled building.

[00231] A store owner can use the notification and the knowledge of existence for loyalty and rewards

[00232] The beacons ID can trigger a link to exiting software and aware the local system of the user existence – such as:

[00233] A traveler is check in into a hotel/resort, the hotel/resort can provides with automatic check-in and interface to the hotel/resort front system.

[00234] A traveler is check-in into a flight in the airport, the airline provides the traveler with automatic check in to the flight when the traveler reach close proximity to a RF local beacon.

[00235] A customer are check into a restaurant or food service, the business will recognize the customer when he in proximity to the local RF beacon.

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[00236] The pedestrian reaches an advertising area or billboard that can be recognized by the user by being in a close proximity to the advertising area and provide the user with customize personalize advertising or offer.

[00237] A customer is entering a store/bank/facility front to be recognized for additional information or services.

[00238] The RF beacons/tags can serve to track employee's work times, including a check-in and checkout time from a designate area.

~~[00239] The RF beacons/tags can serve as part of a payment process, where the user's cellular phone and the local proximity beacons/tags can provide additional security for a mobile payment process, which can be used to replace other current payment methods, such as credit cards.~~

~~[00240]~~[00239] The infrastructure provided by local RF beacons can be integrated into a local dating system.

~~[00241]~~[00240] The local RF beacons with associate with the user mobile can create virtual secure zone for child or elderly or any care monitoring.

~~[00242]~~[00241] The location of the user as associate with the local beacons can be interface with social networking.

~~[00243]~~[00242] The RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking. the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details in US Patent 7,899,583 issued to the Inventor and claimed as priority herein.

~~[00244]~~[00243] The RF beacon can be installed or be a part of a vehicle to provide car application like payments security car broadcasting car tracking car communication and automatic car counting to provide transportation managements with statistically information automatically.

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~~[00245]~~[00244] A system and method to provide a user information which is related to the Point Of Interest (POI), the navigation system provides detection and navigation references, position determination and information related to the object-Point Of Interest (POI) directly and automatically to the user interface-cellular phone upon arriving to a close proximity to the RF tags/beacons installed in the area.

~~[00246]~~[00245] Moreover the application provides more than simply an icon.

~~[00247]~~[00246] At present, no prior art device utilizes the capabilities to display a real-time representation of navigating and get an update directly from the waypoints. Also most systems are designed for the old query type search where interface to Internet and or database central system is needed.

~~[00248]~~[00247] The navigation system automatically detects a signal directly from the RF tags/beacons installed in the waypoints, no communication needs to be established between the mobile phone and the RF tag/beacon not even cellular communication, and no pairing needed. Other systems must have bandwidth available, over which to send a request to a central system or to a database and then must wait for a response, or they need Internet connections. This takes time!

~~[00249]~~[00248] Even if the other systems have bandwidth, they are still based on the existing search concept where the user submits a query, searches and waits for the response. This is impractical. The navigation system provides the information automatically, without submitting any query, and the response is according to the user's location based on RF tags/beacons installed in the local area.

~~[00250]~~[00249] Again, most of the existing prior arts are based either on a GPS based system or the existing car navigator, that depends on a GPS too.

~~[00251]~~[00250] And the existing mapping that these systems use has the same limitations, described previously, and is impractical.

~~[00252]~~[00251] This navigation system bridges the gap between the GPS based navigation and provides a complete solution.

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~~[00253]~~[00252] U.S. Pat. No. 7,031,875 Ellenby et al. describes a pointing system for addressing objects, and provides a system and method based on GPS and Internet/database communication, it is not exactly a navigation but an information based system that need the GPS to locate the user location so indoor services is likely out of the questions and the need for communication as well with GPS limits its availability and accuracy. It is not a real-time update of the waypoints and needs Internet and or central database communication.

~~[00254]~~[00253] The most common problem with today's GPS based systems is that the mapping and the waypoints are not updated on a timely basis. In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be about 2 years old. The new service like Google Earth provides satellite images that are almost 2 years old and for sure can't provide on-line real-time accurate picture of the existing area and the waypoints.

~~[00255]~~[00254] The disclosed technology offers a solution to this task by providing a system and method to generate automatically the waypoint along the user route ether indoor or outdoor the update is based on determine location of the mobile device indoor in proximity to installed RF beacons and the update information triggered by the location determination, such method is not exist in today navigation or mapping especially indoor.

~~[00256]~~[00255] The disclosed technology offers a solution that interactively guides the user to a desired indoor and outdoor destination.

~~[00257]~~[00256] The navigation system and method automatically updates waypoints, by means of an interface to an existing GPS based system, when each Point Of Interest (POI) will have an RF tag/sensor that will broadcast an RF signal that can be converted to a GPS waypoint, In response to the RF signal (from the tags/sensors,) the navigation system will execute the specified file/program that will trigger automatically, executing a waypoint generation program.

~~[00258]~~[00257] For some years, local governments in cooperation with various FM radio stations have been putting together an automated way to get real-time traffic data into cars so drivers can avoid traffic. Real time traffic information includes news such as: congestion, construction, traffic accidents, and recommended alternative routes.

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~~[00259]~~[00258] An RF tag/beacon Bluetooth and or Wi-Fi will be installed at each Point Of Interest (POI). When each Point Of Interest (POI) will have an RF tag/beacon that will broadcast an wireless RF signal with ID that will provide an instant detection, the navigation or the application for local based services system will execute the specified file/program that will trigger automatically, executing a waypoint generation program and at the same time provides the business owner a notification of existence of the user in his vicinity to allow the business to provide the user with relevant messages or offers, more information or push message to the user cellular phone just by being in proximity to the RF beacon .

~~[00260]~~[00259] The "user" will no longer need to enter his way- points manually and then wait for the providers of maps or GPS to update their maps with the information (this can take about a year in some cases). This way the "user" will receive the information that he needs when he needs it and where he needs it.

~~[00261]~~[00260] It provides trigger information according to the beacon/tag, directly from the local area business waypoints and to the user's display device, the detection can be done without any communication In the event that more information is required and the business need to provide more information it may be necessary to connect to the Internet, its allow interaction/engagement as proximity to the RF Bluetooth beacon can trigger a specific application functionalities and provides automatic notification "I am here" to the business owner.

~~[00262]~~[00261] It is believed that sooner or later it will be a standard procedure to install a tag/beacon on every location of interest (waypoint) or any business will provide a waypoint information to the to provide "users" with the information. Most stores or POI/waypoints will be willing to pay for a tag/beacons or pay subscription fee to be on the GPS system providers that are able to show their location and information on a map. Or they will pay for an annual listing (similar to the yellow pages).

~~[00263]~~[00262] The System can interface with existing GPS.

~~[00264]~~[00263] Present GPS providers, map providers and search engines providers: City Navigator and Metro Guide Maps contain many thousands of attractions.

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[00265][00264] These include: Food and Drink, Lodging, Attractions, Entertainment, Shopping, Services, Transportation, Emergency and Government offices.

[00266][00265] In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be about 2 years old. Listed Attractions include theme parks, museums, libraries, schools, parks and such. This feature is very useful in an unfamiliar area. Waypoints will be located automatically in the local area and plotted on the map screen. The waypoints can be stored on the GPS database for future access or store at the user mobile device .

[00267][00266] The navigation system will revolutionize the GPS based systems and the mapping industry, from GPS, mapping companies' communication providers, car manufacturers to yellow pages and local guides; for the first time the user of a GPS navigation system will have an easy, reliable way to reach a destination.

[00268][00267] The most common problem with today's GPS based systems is that the mapping and the waypoints are not updated on a timely basis. The navigation system provides a solution for this problem. Using the navigation system, the user will know where he is, be able to identify "landmarks" around him accurately, and receive automatic updates directly from the Points Of Interest (POI) in the vicinity.

[00269][00268] The navigation system is based on RF tag beacons installed in the local area, each tag or waypoints has its own ID (identifying the waypoint by type, address, etc.). The tag beacon ID and proximity to the RF beacons will allow local detection and interface with existing or indoor application and navigation, GPS based systems, as a floating information display on the GPS map referenced to the user's location. The floating display will provide automatic waypoint updates and will allow the user to search local providers (waypoints/store and more information about the store/business, the detection allows the local business to have an automatic notification about the user whereabouts in proximity to his business and allow him to provide the user with more information about his store/business/deals.

[00270][00269] The fact is no digital maps are entirely accurate. A user needs to know which map makers are used by the product that they are interested in and check the maps for the

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area that they are concerned about. In addition some map databases are created from vector data while others are just scanned copies of paper maps. In addition to mapping data these same map makers can often provide Points Of Interest (POI) data. However, a software company might use the maps from one company and the poi data from another. POI data normally takes three forms. One is public buildings, parks, airports, and possibly geographic objects. A second is government locations that include specialized points lists like marker buoys and airplane marker. Finally, there are commercial establishments that usually include some information about their product and contact data. Note that the location of commercial places is often derived from the street address and is not based on the actual lat/Ion location.

[00274][00270] Moreover there is the sky-high cost of digitizing and updating the poi and the waypoints.

[00272][00271] The task is to provide a solution where the "user" will receive real-time Point Of Interest (POI) or waypoints in the area automatically to his existing navigation system or to his cellular phone, the waypoints information can be a real-time information update in real-time and can be changed according to the waypoints.

[00273][00272] A cellular phone application, which the user will scan the area for exiting RF Bluetooth beacons or Wi-Fi beacons will receive data and more information utilizing the cellular phone's Bluetooth capability.

[00274][00273] The system can trigger application as well as link to existing systems and software. A notification can be sent to a web, email a cloud application or even social network, The navigation system will interface with existing in-car media system and in car navigation systems.

[00275][00274] It is understood that the waypoint or Point of Interest (POI) will be represented by the following suggested ID examples as part of the beacon ID to be recognized by the user Bluetooth mobile device (cellular phone), according to the type of the POI:

Waypoint **Waypoint**

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ID Code	POI Type	Cat. Type
32	Food/Restaurants	Food
33	Gas Station	Information
34	ATM/Banks	Finance
35	Department Store	
36	Apparel	Store
37	Sports	Store / Information
38	Books video	Store
39	Jewelry	Store
40	Toys/Photo/Elect.	Store
41	Music	Store
42	Gifts	Store
43	Furnishing	Store
44	Service	Service
45	Computers	Store/Service
46	Hairstyle/Cosmetics	Store/Service
47	Office	Office
48	Security/Police	Service / Emergency
49	Children's program	Service
50	Social Affairs	Religious Service
51	Religion	Religious
52	Phone	Service
53	Travel	Transportation Service
54	Parking	Transportation Service
55	Guest service	Service
56	Library	Service
57	Transportation	Management Service
58	Municipal	
59	Post Office	Service
60	Government	
61	Market	Store/Service
62	Alarm	Emergency
63	Emergency	
64	Hotel resort and cruise ship	

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65	Education facility, school, university	68	Amusement park
66	Sport facility, sports arena, stadium	69	Implements as mail and address
67	Conference and show	70	Implements in a road as road sign or transportation entity

[~~00276~~][00275] Be remember that the ID above is only suggested example, the fact is that part of the beacon ID will be to recognize the Facility/store type the location to provide instant detection and location determination by just being in a close proximity to the RF beacon in the area.

[~~00277~~][00276] The navigation system enables remote and local update of the local floor plans and the information about the local area and waypoints business in the area, when the location's indoor application can be triggered to download at the destination. An example of this would be at the entrance of a shopping mall, department store, amusement park, museum, parking garage or the downtown area of a city where a sign or the shopping mall information sign will provides direct information a trigger to download the local application.

[~~00278~~][00277] The system can work inside a building whereas GPS cannot. Local detection is obtained via popular Bluetooth interface.

[~~00279~~][00278] The system provides information about each facility/store, including information about the type of the facility, for example: type of store or product etc., the information trigger to deliver to the user mobile device by being in proximity to the RF beacon ID that installed in the local area.

[~~00280~~][00279] By providing the ability to locate a the user in an area using a Bluetooth enabled device or a cellular phone with the navigation application, the system overcomes the anxiety of "Where am I" and also facilitates finding a parked car later via the RTP (Return to Parking) feature.

[~~00281~~][00280] The system has the capability to perform all the functions of a search and can become the "Next generation search out of the box".

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[00282][00281] The navigation system can be an attractive addition to existing deployments of Wi-Fi and Wi-Fi hotspots and a feature for business and cities that deploy Wi-Fi.

[00283][00282] In case of an emergency or security situation, the system can provide authorities with information.

[00284][00283] Utilizing the navigation system, the facilities (waypoints) in the vicinity around the "user" car are displayed on a floating overlay using either a cellular phone application, or a standalone device, or an existing installed navigation system with or without any mapping, the information can be pushed to the user's device when he in proximity to the area.

[00285][00284] The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[00286][00285] The option of downloading a floor plan can be exercised either remotely or locally as part of mapping or navigation application.

[00287][00286] With the navigation system, the user will have the information that they want, when they want it, where you they it ...(and at an affordable price) Once you are in the vicinity of your destination and you switch on your navigation device, you will automatically receive the facility information along your waking route and in all directions around you.

[00288][00287] Additionally, each facility type can be ID-coded apart of the beacon ID to identify the type of the store etc., e.g. restaurants, men's wear, women's wear etc. the store type, real estate property, garage sale location, special sale and all up to date real time information that can't be displayed and located in today's navigation system, and tapping to the local business industry is known as local advertising.

[00289][00288] Each ID-coded as part of the beacon ID can be trigger accessed to obtain complete information about the store e.g., automatic waypoint information.

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[00290][00289] The system can be operate on a cellular phone, and navigation system and is not limited to a GPS navigation system.

[00291][00290] Moreover, the navigation system can solve the "RTP" (Return to parking) problem, where many forget where they parked their car. The system has an option to save the location on the "cellular phone-parking detector" application, which will make it easy to locate the parked car.

[00292][00291] The navigation system is designed for global use and is not limited to malls, stores, amusement parks, museums, sports stadiums etc. It can be implemented in parking garages or parking spaces metered or not, almost anywhere and in any place even in any infrastructure.

[00293][00292] It is envisioned that in the future all new construction/infrastructure will have the beacons/tags included in the design or built in the structure..

[00294][00293] One feature of the proposed invention integrates the navigation as part of the NAV4 concepts where it will provide complete solutions for local navigation in an area where the GPS and GPS mapping just can't provide accurate and updated information that is so essential to the user.

[00295][00294] A typical application is navigating a pedestrian in an environment like a mall, department store, specialty store, conference, trade show, amusement park, university, hospital, school, municipal building, museum, subway, train station, airport, down town center, any type of parking facility ...or any place when and where GPS cannot be provided or is not accurate or precise enough. The system can be used for navigation by first responders to emergencies or disasters.

[00296][00295] The navigation system is part of a broad suite of applications that include a complete solution to the "user" from the time that he parks, or begins looking for a space to park his car, walking to the store/mall to when he wants to return to his parked car, looking for the place that he parked.

[00297][00296] The suite may include:

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~~[00298]~~[00297] Parking detector-and navigation to the empty available parking space.

~~[00299]~~[00298] Nav4 mall/store navigation solution inside mall or store.

~~[00300]~~[00299] RTP-return to parking-locate the place that you parked your car.

~~[00301]~~[00300] For example, a typical application could be:

~~[00302]~~[00301] A pedestrian asks the way in a mall to a specific store.

~~[00303]~~[00302] A pedestrian asks the way inside the store, to a specific aisle or product.

~~[00304]~~[00303] A shopper in a department store asks for a specific department.

~~[00305]~~[00304] A pedestrian asks the way to a Point Of Interest (POI).

~~[00306]~~[00305] In an emergency, the first response team has to navigate inside a smoke filled building.

~~[00307]~~[00306] A system and method to provide user information which is related to the Point Of Interest (POI)

~~[00308]~~[00307] The navigation system provides detection and navigation reference, position determination and information related to the object-Point Of Interest (POI) directly and automatically to the user interface-cellular phone without any communication help of Internet/web or cellular needed . . .

~~[00309]~~[00308] Special operation mode:-Shopping- NAV4SALE-provides navigation to the special sale item in a department store. A new unique tool for the business owner as well to the customers-to navigate and locate an item in a store/mall that's on a special sale, will provide the "user" a way to navigate in/out door for the "waypoint" represents the special sale, coupon, special event, promo etc ...an add-on to local advertising.

~~[00310]~~[00309] The local advertising market is estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of a local strategy. Due to the lack of availability of the GPS indoors as well with the limitation of its accuracy outdoors and the non-updated

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mapping that is provided today by the mapping and GPS industry, there is no real tapping to this huge market.

~~[00311]~~[00310] The navigation system can bring a new life to the navigation and mapping industry by providing a unique innovation that combines the GPS and the existing navigation as well as the cellular phone users with an indoor navigation based on the local map/mall that will provide the user a navigation to his desire location in the mall/store to the right store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. A new unique way to bring the customers to the product in sale . . ., direct the customer directly to the isle and to the product that you want to move. The store will also have an option to deliver more content (advertising, sale, coupons, promo etc ...) to the user when he approaches the store or is already inside via push technology to the user's Bluetooth enabled cellular phone.

~~[00312]~~[00311] Special operating mode:-Museums- NAY4Museums NAV SHOW and NAY CONFERENCE provides navigation and interactive information from the museum's show or conference exhibition to the "user's" cellular phone device via Bluetooth interface.

~~[00313]~~[00312] Explore museum or conference show exhibits in a new unique and easy way, find your way around when navigating on the floor map of the museum or conference, indoor navigation, navigate to exhibits, restaurants, cafes, lavatories etc., all to the "user's" navigation or cellular phone.

~~[00314]~~[00313] Any museum, conference, or show provides the attended a map to the exhibits, some also provide additional audio device (headset) to get more information on the exhibits.

~~[00315]~~[00314] The navigation system will provide a unique indoor tool that will allow the attended to navigate the museum, conference or show in an easy way directly to his Bluetooth enabled cellular phone, when he reaches his desired exhibit he will allow to download directly to his cellular or Bluetooth headset information about the exhibits. An indoor navigation to the exhibits as well to the restaurants, cafes, lavatories etc., all to the "user" navigation or cellular phone and based on the facility map.

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[00316][00315] Special operating Mode: Navtrain- For all the users of mass transportation system, the navigation system will allow, locate and point the "user" to the exact station or location on a route, an easy way to navigate in the train, subway, underground system, a new way of "sub- way" or bus mapping in/out door and directly to the user navigation or his cellular phone. Every day millions of people are using the mass transportation system, trains, subways, buses, each of the passengers depend on the transportation map for the route information as well as schedules and additional services provided by the transportation system. Most of the passengers today carry with them a cellular phone.

[00317][00316] The navigation system will provide the passenger with the navigation inside the transportation system directly to the passenger's Bluetooth enabled phone, the passenger will know the exact location/station on the route as well with additional option information like schedules. A new add-on service to the transportation providers as well to the passengers, utilizes the indoor navigation method and the ability of the transportation entity to use the RF beacon installed in a transportation facilities to have add-on to transportation management control system .

[00318][00317] Specialoperating mode:-Parking- NAY4PARKING describe in 2 patent applications, provides empty parking space detection and navigation. where is the RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking. the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details in US Patent 7,899,583 issued to the Inventor and claimed as priority herewith.

[00319][00318] A new generation of urban parking innovation that answers the most demanding need of any driver knowing where to park ..., or more precisely, find and navigate to the empty parking spaces in and around the driver. It will also provide the answer to "where did I park my car?" syndrome, when returning to the parked car. In our society where time, convenience and comfort are precious commodities parking is a major headache.

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[00320][00319] Parking Detection System is the next generation of urban parking and the answer to the most demanding need of any driver-Where to park?

[00321][00320] The navigation system provides a method of self organizing parking system will enable municipalities and other parking authorities to easily identify, exploit and manage revenue opportunities while at the same time providing better service at a lower operating cost. With the implementation of the navigation system, navigating and detecting available parking spaces will become part of the information revolution.

[00322][00321] With the navigation system, drivers will save time and reduce the frustration of hunting for parking spaces, and will also save money on gas use and car maintenance costs.

[00323][00322] By using and modifying existing technology, our system will integrate easily with other transportation and communication systems. The RF beacon can be attached to existing parking meters, and in the future will interface with them and eventually will replace them.

[00324][00323] Municipalities will have better control and centralized monitoring of their parking space inventory, resulting from the new generation of urban parking.

[00325][00324] Special operating mode: NAYRealty - A new unique tool to accommodate the real estate industry by providing the seller/the real estate agent as well as the real-estate customer to locate and navigate to the available real estate property in the "user" area, according to his location and directly to his GPS navigator and/or cellular phone. The user may wish to see and locate the real estate property available in his area according to his location, where an RF beacon can be installed in each real estate property to trigger more information about the available property to the user/ possible client when he reach proximity to the property.

[00326][00325] According to the Newspaper Association of America, the real estate advertising market is estimated at$11.5 Billion. Recently Mynewplace.com joined apartments.com and rent.com in the $3 Billion on-line apartment listing. **ZILLOW**, a new startup company just raised $32M in founding with the basic idea to put your house on Google

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Earth-satellite mapping. Google, Yahoo, AOL, ASK and Microsoft are looking to develop real estate products.

[00327][00326] The navigation system brings the listing to the user's hand, by combining the GPS navigation and or cellular phone the user will be allowed to get the real estate property in his area updated according to his location in real time.

[00328][00327] The user even will have the option to "search out of the box" of property in his area. The navigation system will serve as a new tool for the real estate industry as well to the search engine for the benefit of the seller/the real estate agent as well as the real-estate customer.

[00329][00328] Special operating mode:-NAV4STORE and NAVMALL provides navigation inside a store/department store to a specific department/aisle or specific product, with the option for advertising methods and special promotions. Explore the indoor mall or inside a department store, navigate to the right place or the store or the department that you need.

[00330][00329] Navigate on the mall map/store mapping to find your way around using your cellular phone or navigation system without a GPS. It will be a new kind of service and a new marketing strategy for the malls/store business owners. An add-on to local advertising.

[00331][00330] The local advertising market is estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of local strategy. Due to the lack of availability of the GPS indoors as well as the limitation of its accuracy outdoors and the non-updated mapping that is provided today by the mapping and GPS industry there is no real tapping to this huge market.

[00332][00331] The navigation system can bring a new life to the Navigation and mapping industry by providing a unique innovation that combines the GPS and the existing navigation as well as the cellular phone users with an indoor navigation based on the local map/mall that will provide the user a navigation to his desired location in the mall/store to the right store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. The store will also have an option to deliver more content (advertising, sale, coupons, promo etc.) to the user when he approach the store or is already inside via push or Internet to the user's Bluetooth enabled cellular phone.

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[00333][00332] Special operating mode:-NAV Amusement Parks-Theme and amusements Park navigation, navigate to your desired attraction as well as a new way to register a "fast pass" kind off lane ...all in an easy way to the "user" cellular phone without the need for GPS. Provides a new media and-on service.

[00334][00333] Ever wonder what it will be like to navigate inside the amusements park to the desired attraction, to know the schedules of the show events at the attractions and even to get your "fast pass" from a remote instead of standing in line ...With the navigation system, all this can become a reality and go directly to your cellular phone without the need for a GPS. It is understood that the present invention can provide a new tool and service to the benefit of the amusements parks as well to the user.

[00335][00334] Special operating mode:-NAVSIGN-will pro- vide the user with automatic generating waypoint of the road sign to be displayed on the user navigation and or cellular phone or the car navigation or on the dash board as a way for secure driving, the information can interface to the car computer for example automatically slowing down when it enters a school zone-NAVSIGN.

[00336][00335] Special operating mode:-NAV EMERGENCY: One of the important features of our indoor navigation techniques will enhance the ability of the first response team to navigate within the buildings in which it has been deployed.

[00337][00336] The navigation system provides a method that is a low-cost, reliable solution for firefighters and other first responders, inside buildings, to navigate where a GPS is not reliable-indeed, the GPS signal may have been disabled temporarily to prevent exploitation by terrorists, or even more likely no signal can be received at all inside a building.

[00338][00337] The navigation system envisioned this limitation of GPS based systems, and is intended for an environment that is potentially much less "friendly", the environment inside a building that first responders encounter may contain smoke, dust, or flames, and is intended to leverage advances in ubiquitous RF/Bluetooth tag technology.

[00339][00338] The navigation system will exploit the capability of storing critical building information, such as the floor maps and the emergency escape plans, for retrieval and

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navigational assistance via a Bluetooth enabled cellular phone, when and where it is needed. Moreover the navigation system can serve as a navigator for the emergency exit route when and where it is needed. Each user can download the emergency exit floor plan and escape with the knowledge of his exact location in that route.

[~~00340~~][00339] Aspects of the scenarios to be included:

[~~00341~~][00340] Identifies and tracks the user (a first response team member).

[~~00342~~][00341] Provides the user with navigation information and directions for safely exiting the building.

[~~00343~~][00342] Provides location information of all team members, via an ad hoc network of radio terminals that combine RF/Bluetooth and allow communication chat and messaging between the team members without need for Internet or cell communication such option is not limit to the first response team but to a user in emergency and non-emergency use.

[~~00344~~][00343] From the outset, the navigation system was been designed with the capability to utilize existing technology so it can be deployed as a stand-alone system, or in tandem with existing systems.

[~~00345~~][00344] With the implementation of the navigation system, a FIRST RESPONSE TEAM will be empowered to navigate and find its way in a case of emergency or a disaster. This capability can be a critical life saving power in modem congested urban living conditions that was not available before now.

[~~00346~~][00345] It is believed that implementation of the navigation system will assist counter-terrorism activities and more importantly will help the first response teams to save the lives of people trapped inside buildings.

[~~00347~~][00346] Waypoint Navigation

[~~00348~~][00347] A waypoint is a fixed location with known address location, longitude and latitude and coordinates. The navigation system is capable of storing a database of waypoints for the following purpose:

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[00349][00348] Waypoints mark a destination, a point along the way to a destination, or a point of reference. Normally, navigating, a "route" consists of one or more waypoints. To traverse a route, the user navigates to the nearest waypoint, then to the next one in turn until the destination is reached. The system has the ability to compute a great-circle route towards a waypoint, enabling them to find the shortest route even over long distances. The system enables users to locate a destination on a map and define it as a waypoint. The system is intended for navigation; it can generate a suggested route between two waypoints, based on the cartographic database. The system indicates the user's current location and gives advance notice of an upcoming point.

[00350][00349] Because the system knows the waypoint positions, and the distance between them it, it is easy to determine the "user's" exact location.

[00354][00350] Map Matching

[00352][00351] The navigation solution is further enhanced, although it is not essential, when the system knows that the person or object being located is traveling along known routes on a map; for example, the system can assume that people can only follow certain routes in a mall. This is priori information that can be used to "force" the estimated position to be on the nearest point on the possible routes. The constraints of indoor construction similarly can be used to refine estimates of the position of a person or object moving within a building-people and objects do not pass through walls, they pass along corridors and through doorways. It is the best solution for a system in case of an emergency or for a system for homeland security or a system to locate and inform the subway location, a good example is the hotel exit floor map.

[00353][00352] In all, the unique method can be summarized as follows:

[00354][00353] Direct communication between the area (way- points) and the user (navigation/GPS)

[00355][00354] Automatic waypoint generation in real-time according to the user area

[00356][00355] Indoor/outdoor even without GPS

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~~[00357]~~[00356] Business model when the business/store owner will be subscribe to the listing in the navigation/GPS mapping

~~[00358]~~[00357] Provide overlay floating model to be work even without mapping

~~[00359]~~[00358] No Internet or cellular communication is needed to detect and determine a user's location for additional location based services (LBS) information and push and or data Internet service needed.

~~[00360]~~[00359] Can interface to the existing system and link to existing software and hardware system.

~~[00361]~~[00360] The option of search is done locally on the user device, no central database or Internet search needed.

~~[00362]~~[00361] Bluetooth interface to cellular phone, will run as application on the Bluetooth enabled device, such as a cellular phone.

~~[00363]~~[00362] Provides indoor navigation and indoor facility map and or floor images-guide and navigation.

~~[00364]~~[00363] All global positioning system (GPS) navigation systems lack of real-time displays of the waypoints around the driver/user route, most likely, the information of GPS maps may be old and therefore inaccurate.

~~[00365]~~[00364] The navigation system provides a system and method for generating and updating in real time a navigation's waypoints automatically along the route according to the user associated with local detection of RF beacons installed in the area and will for the first time trigger an a delivery of real time waypoint information along the user route directly to the user's navigation and/or his cellular phone.

~~[00366]~~[00365] The navigation system will enable a circular omni-directional display on the map or floor images floating overlay on existing navigation map or floor mapping or indoor floor images .

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[00367][00366] The waypoint data trigger generates directly from the way- points beacons ID, no Internet or cellular communication is needed to determine the location.

[00368][00367] The navigation system will bridge the existing navigation system and GPS mapping to new real time information according to the user's location.

[00369][00368] The navigation system will allow for the first time the navigation and GPS industry to tap to the local advertising market estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of local strategy. Due to the lack of availability of the GPS indoors as well as the limitation of its accuracy outdoors and the non-updated mapping that is provided today by the mapping and GPS industry there is no real tapping to this huge market.

[00370][00369] It is believed that the navigation system can bring a new life to the Navigation and mapping industry as well to the cellular providers by providing a unique innovation that combine the GPS and the existing navigation to the real time information directly from the waypoints, which can be referred to as a COOLSPOT.

[00374][00370] This invention is directed generally to the field of navigation and, more particularly, to such a method to be used indoors or outdoors in a mall, store, buildings, department stores, and to provide local based services directly to the user's navigation or cellular phone.

[00372][00371] The proposed applications have identified and resolved a great deficiency in the technology available for local businesses. LBS represent a huge advertising and mapping market-estimated at over $150 billion a year. It represents a big opportunity in the navigation market that has not been explored yet

[00373][00372] Existing System and Industry Trends:

[00374][00373] Local mapping today is mostly paper: Mall maps, store maps, mapping of department stores, commercial buildings, hospitals, schools, campuses, municipalities, shopping centers, downtown districts, indoor facilities, building maps, parking areas, parking garages, amusements parks, subway systems, transit maps, museum maps, area attractions maps, hotel

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and resort maps and even more importantly the emergency maps and procedures posted in buildings.

[~~00375~~][00374] Factors in Local Mapping

[~~00376~~][00375] Local maps can be of either indoor or outdoor locations.

[~~00377~~][00376] Local maps are available on paper, on the web, and in some cases on a kiosk in the facility.

[~~00378~~][00377] A high degree of accuracy is needed in order to provide usable maps for navigation indoors-less than 10 m-to a store or even a parking space.

[~~00379~~][00378] GPS cannot provide acceptably accurate mapping as it is only accurate to within 100-200 feet. This is the reason that the GPS industry does not provide this type of mapping. The same is true for cellular network providers, as the accuracy is also 100-300 feet, and then only when the signal is available. Signal availability is often a problem indoors and also when it is most needed-in an emergency situation when most of the cellular network fails due to high demand. Again, this is the reason that there is no local mapping available for cellular users. (Local mapping equates to accuracy in finding a store, room, or parking level within 5 m.)

[~~00380~~][00379] At this time there is no indoor navigation solution. The most recent technology provides access to a user's location through a combination of group "social networking" and a "buddy list".

[~~00381~~][00380] Most technology available today attempts to "locate" a moving "user" in an area, the present invention reverses that idea and lets the "user" navigate the local area on the local maps, indoor navigation compared to outdoor navigation, pedestrian navigation is more than locating and navigating, most likely they are at or near their destination already. There are two possibilities, either they are in unknown surroundings and their task will be to explore the surrounding or they are looking for a specific product-their defined goal is like buying a new pair of shoes or getting a book or just going to shop around, exploring a new location, new deals, specials sales, or simply sightseeing.

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[00382][00381] The theory is based on the belief that "you are what you do" meaning, the services, specials, sales, coupons, discounts, and the like are one key element.

[00383][00382] The main task of indoor navigation is to show the user where the specials, sales, and coupons are and direct-navigate the user to them and at the same time provides the business owner with a marketing tool that as of now is not exiting . The integration of multimodal journey planning and guidance to dynamic waypoints, sales, specials etc.... and complex public interchange facilities are not adequately addressed by existing systems.

[00384][00383] In some aspects, indoor navigation looks simpler than outdoor navigation. For instance, the geographical area covered is much smaller and the expected speed of travel-walking-is much lower. However, other aspects make indoor navigation much more challenging. First among these is the unsuitability of GPS and related technologies. Second is that in a complex indoor environment the requirements are more stringent. For example, vertical positioning of the topology and the need for accuracy less than 10m-to the store, the product, and even to the aisle or the parking space-cannot be achieved with today's existing system.

[00385][00384] The indoor market represents much greater potential than outdoor navigation, as on average people spend more than 90% of the time indoors ....

[00386][00385] The Objectives and Goals Behind This Concept: The technology behind the navigation system is quite simple-a direct communication between the user's device/cellular phone, Bluetooth enabled device, and a Bluetooth tags/sensors/beacons installed in a known location in an area/ building/store/facility without relying on GPS, centralized servers, Internet bandwidth or even cellular communication-they can be supportive but are not essential.

[00387][00386] The main concept is to use existing off-the-shelf technology (Bluetooth) with small modification and devices with a minimal cost of deployment and to provide a simple indoor/pedestrian technology which can delivers accuracy with an integrated suite of applications especially designed for the user/shopper indoors, the system is based upon RF beacons Bluetooth or Wi-Fi installed in the local area to be scan by the user device – cellular phone and use the proximity scan beacon ID and signal strength to provides an instant detection a notification of existence to the business owner and trigger delivery of update local based

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information all without even exchanging a real communication (no paring etc.. needed) with the proximity beacons.

[00388][00387] The System Includes:

[00389][00388] Local mapping or local floor images – the indoor view of the facility as part of the application, the facility can offer a download or participating from a proximity information sign or the store/mall/building information to trigger download the application or ability to pre load the maps as part of navigation or mapping application before reaching the area or download from the web according to location determine by the RF beacons.

[00390][00389] Ability to have special navigation software either as an add-on to existing navigation on the user's cellular phone or existing navigation system (car, mobile) using the Bluetooth beacons to determine the exact location and trigger applications.

[00391][00390] Ability to deploy Bluetooth beacons in the local area where the beacon will broadcast ID to be known the location-waypoints and trigger additional information and or local based applications and to provide the infrastructure needed to guide navigate in the area. A very low cost and fast deployment beacon system.

[00392][00391] The ability to use the log of the "user" Bluetooth ID or the Bluetooth ID as a key (NOT THE CELLULAR NUMBER) for future marketing purposes or for emergency use. This aggregation of data with association to proximity Bluetooth beacons ID will be in valuable to retailers, business etc. Bluetooth enabled cellular phones can be used as beacons.

[00393][00392] The beacons-parts of the navigation system are Bluetooth tags/beacons installed in known locations in the area/facility and represent "waypoints" where is the beacon ID can represent the facility type, store/ special sales, places etc. and the location in the facility location....

[00394][00393] The scanner detection part of the application -whenever a mobile phone or mobile device with a Bluetooth switched the Bluetooth on and loaded with the application, it will periodically scan the area for Bluetooth beacons; proximity to a tag/beacon and the tags/beacons ID as well with signal strength will determine the "user" location on the area/ facility map and

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will trigger an automatic notification automatic check-in to the business owner to trigger application with possible a link to existing system to provide the user and the business owner additional information just by being there an use the method above.

~~[00395]~~[00394] The navigation-can be plotted between way- points/store/places on the map.

~~[00396]~~[00395] In regards to the sale sense-marketing tools, the system works by passively observing the initial part of the scanning of movement. The proposed system does not monitor or listen to conversations or text messages. Nor does the proposed applications transmit or intercept any information or interfere with the mobile network operators in any way. The navigation system is a scanning detector (not a receiver or transmitter) which can observe the unique Bluetooth ID/key set of the device (not a telephone number or name ...) with association to the beacons ID which the device was near and aggregate resultant data to be server for habit and/or preference for triggering content delivery.

~~[00397]~~[00396] Sales sense represents a method to use dynamic user input profiling with proximity beacon ID installed in the known location indoors and outdoors for empowered presence and trigger content delivery for a real life interaction and all under the user's complete control and without compromising his privacy. The paradigm of proximity-based discovery and communication enabled by Bluetooth technology can be very relevant in Ambient Intelligence as an enabler for a situated interaction.

~~[00398]~~[00397] The navigation system explores the use of predefine user input (user profile or preference) as a key driver for situated interaction and trigger content delivery according to the user profile/preference. The approach is to use of RF Bluetooth beacons installed in a known location in a local area to trigger action witch associates the user cellular phone ID and or profile / preferences beyond self-exposure and introduces a method that can trigger actions.

~~[00399]~~[00398] The approach to the use of Bluetooth ID of the beacon beyond self-exposure and introduces as a technique in which the system can recognize the Bluetooth ID as explicit instructions to trigger actions/process.

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[00400][00399] Firstly, because it has an extremely Low entry barrier, Bluetooth is a widely available technology. Most of all phones include the Bluetooth, and setting new Bluetooth device ID is normally a relatively simple task that can be accomplished with the base functionality of any mobile phone. This easy availability is of huge importance in enabling social practices around the technology and represents a major difference to other sensing and interaction approaches that, albeit more sophisticated, may require specific hardware or software in personal devices. Secondly, the use of Bluetooth presence for situated interaction combines very well implicit and explicit forms of interaction, in fact blurring the distinction between them. Simply by scanning the proximity Bluetooth device, people are already part of the situation and implicitly engaging with the system.

[00401][00400] This continuous, flow of presence information can be fundamental in the aggregation of situated content and may act as an important catalyst for more explicit forms of interaction. This is what mainly differentiates interactions based on Bluetooth presence from other interactions.

[00402][00401] The chosen methodology combines a user define profile encode into the Bluetooth device by setting up a user like VIN number, with user privacy as a priority, the profile is encoded into the user Bluetooth device with an algorithm sequence protecting the user's privacy.

[00403][00402] It provides important practical implementation of the Technique and on its usability within the complex set of social phenomena that characterize situated interaction in a public places without compromising the user privacy. Its effectiveness and simplicity can make it easily adoptable for applications like local social networking interactions, near field communication like secure transactions, payment methods, secure recognized methods and trigger secure processes and delivery of direct content according to the user profile or preference, all again without compromised user privacy and provides the user with complete control all the time. The method can be integrated and provide privacy and secure transaction to empower application that may otherwise exploit user ID, his profile and privacy as such the method can provides a secure payments transactions.

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[00404][00403] Every day millions of people access the Internet and enter their profile, personal information, or answer questions about their preferences in order to access a service / site, to get incentives, coupons, specials, etc... The sites use the information for marketing and in some cases share or sell the information. Recent research has found that most people are willing to give information for incentives.

[00405][00404] Using the profile and records, the surfing habits of the user (IP) is the way that all the search engine companies make money on the Internet. At the same time they try to direct the content to the user according to their profile/habits.

[00406][00405] But what about real life? People spend more and more time indoors (according to recent research, people spend more than 90% of their time indoors).

[00407][00406] A scenario of searching for stores, items, special sales, and coupons according to our desire is repeated again and again... The question is how can the system transfer the success of the Internet marketing tool and the easy search for real life?

[00408][00407] That is the main idea behind the navigation system – what if a system can take a profile / user statistics or even user input with them anywhere and provide one or more intelligence marketing tools. Moreover, the user is in complete control over their privacy, they can just shut the application off.

[00409][00408] In the disclosed navigation system, the user has their profile sales preference and they are encoded into the user's cellular phone to be associated with the proximity beacon ID installed in the local area . (There is 3 ways: A. set segment - the segment keys are not unique and help to setup the user segment only. In that case the key is not unique. B. To generate a unique key – to be used like the Internet IP. C. Create a dynamic key and multiplies profile according to location/user preferences.

[00410][00409] The profile can include: Gender, age, and sales preference (interest), and does not include any personal profile. It may be the same as seeing the user and recognizing their gender, age, and other preferences just by looking at the user. The user is not revealing any kind of information that most sites ask for in a registration process and no personal information like name, address, or telephone number is exposed.

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~~[0041]~~[0040] As part of the suite of LBS application, the user's phone will scan the area for the tags/beacons. For example – by being proximity close to the directory stand in a mall a decoding of the user key will be processed in order to allow the user preference segments and trigger delivery to the user with ads, specials, and incentives according to their profile as well as providing again the business owner with the best marketing tool- knowing his customers they profile and habit all using a very low cost RF Bluetooth beacons installed in the area and associate them with the user Bluetooth device-the cellular phone.

~~[0042]~~[0041] "Your customer is telling you what they want, are you listening?"

~~[0043]~~[0042] The main idea behind this is to provide the user with pin-point content according to their desired preference at the location trigger by the proximity beacons ID and also direct /navigate them to the desired location where they can find the store/sales/special/coupons or the information that they are looking for able to get meaningful data around shopper habits and store layouts statistics, as well as to help them partner up to offer better loyalty incentives to their customers through programs that extend beyond single storefronts, its sensing second-by-second a shoppers interest about specific product, place and can provides the business owner with a complete marketing tools not available until now and at the same time provides the user with offers directly from the business according to his habit preference profile.

~~[0044]~~[0043] The sales sense, user preference module is an add-on to the sales sense marketing where it joins the user behaviors module to create a very unique LBS business and marketing model. Imagine a potential customer standing in a crowded store aisle, feeling overwhelmed by all the choices. What if you could just reach out and give him or her something to help with the decision – a coupon, product information, discounts — right at that moment? Content marketers will soon have the ability to do this and a whole lot more just by implementing our method.

~~[0045]~~[0044] Sales sense-Shopping Behavior: How consumers decide what to buy and when is going to drastically change. Winning marketing need to provides and will require getting exactly the right content in the right place at the right time with even more precision. Shoppers will have the ability to collect real-time information, comparison pricing, discounts and other helpful, highly tailored data as they walk through a store or browse near particular items. It will

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be imperative to produce well-timed, compelling content that is useful in those crucial moments before a choice is made. Sales sense – next generation marketing tools, from coupons and giveaways in stores to tours of museums to airports that provide real-time flight information, the possibilities are endless.

[~~00416~~][00415] Consumers will start engaging with content in a whole host of new ways. Rather than just providing information suitable for a web browser or even a mobile user, marketers will need to think about ways to provide content that will be of value to users as they live their lives. From businesses to city parks to, the system provides a user tools to access helpful, real-time data like never before. As recently published research showed that on average people spend 90% of our time indoors. The proposed invention allows an effective integration of on-line and off-line shopping.

[~~00417~~][00416] Moreover, according to research, indoor navigation may be more important than outdoor navigation and may represent a huge new market.

[~~00418~~][00417] Our technology allows shopping centers, malls, department stores, buildings, airports, train stations, exhibition centers, museums, and amusement parks to understand the way that their customers or passengers flow through their premises. At the same time it provides the user/shopper with unique indoor navigation capability without compromising user privacy.

[~~00419~~][00418] Our innovation will allow, for the first time, the navigation and GPS industry to tap into the local advertising market, estimated to be $134 Billion in the US alone.

[~~00420~~][00419] Our technology provides a reliable method for identifying the path habits and the behavior that people take through an area. There are a number of advantages to our technology including:

- Extremely large sample size as mobile penetration is above 90%,
- Shoppers remain anonymous,
- Accurate to within 2m, and

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- Based on a Bluetooth technology.

[00421][00420] For retail areas, malls in particular, the advantages of understanding shopper behavior are significant. Such information can assist the mall to:

- Evaluate and improve their retail tenancy mix by identifying which stores shoppers consider complementary,
- Identify underutilized areas in the mall,
- Understand the impact of anchor stores on the mall,
- Measure the implications of particular promotions or center events,
- Assist with planning day-to-day mall operations,
- Provide add-ons for the shoppers,
- Provide shoppers with a "web" like shopping experience,
- Provide shoppers with incentives /advertising,
- Increase security ,
- And in an emergency provide the shoppers with alarm and notification, and
- Allow shopper engagement with the store, the RF beacons can become the small neighborhood store by recognize the shopper, what is missing from the on-shopping.

[00422][00421] Our technology is the only system on the market today that can gather information on shopper paths continuously and accurately based on locally installed RF beacons without any need to establish any communication relationship between the user cellular phone and the beacon (no paring or any communication needed to determine the location) and all without compromising the shopper ID or their privacy.

[00423][00422] The various methods disclosed can also provide a way of surveying the behavior and preferences of the "user" shopper simply by observing the signals (encoding

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Bluetooth naming key) given off by their mobile phones and associate it with the proximity beacon ID which they are near and at the same time provide the shopper with a unique special application for indoor navigation triggering a local based services applications.

[00424][00423] The present invention provides a next generation approach to the location based services (LBS) market, especially to indoor applications and to areas where a GPS cannot provide accurate navigation.

[00425][00424] The data collect using the disclosed technology can be used to provide trend reports showing which shops are most visited and at what times, whether there are sufficient public facilities to serve the visiting shoppers or whether more security staff are needed to name only a few of the potential benefits. Ultimately, the collected data can provide assistance to shopping centers to become more in-tune with their customers so that they can create better, more pleasant places to visit.

[00426][00425] The proposed analytics can turn shopping center/department store/store into finely tuned sites, enabling mall/store owners to direct the flow of traffic efficiently around the information coming from the user to the benefit of the user and the business owner to provide services such as VIP personalize services, and the like.

[00427][00426] In contrast to alternative techniques, there is no device that tracks the user cellular phone. In the disclosed methods the user device/ cellular phone is the one that scans and tracks tags/beacons along the route, each scan includes the beacons ID and the user device mobile phone ID, and while these keys help track the movement of the signal and its owner, they don't reveal the identity of the user. This is a more precise method than what Google maps uses to detect a general location on a mobile phone by cell towers which are accurate between 300-1000m compared to our accuracy which is below 10m.its allow the business owner to be notify about the user existence in his vicinity and allow sending the user offers/deals more information and at the same time collect very important information to the business owner such as habits, profile, preference of the user to provide precise contents directly to the user cellular phone.

[00428][00427] Example of Scenarios:

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[00429][00428] A user in a mall can use a local guide and navigation application suggest to him to download at the mall/building/facility or have the application already as a cellular phone mapping application.

[00430][00429] As part of the application the Bluetooth on the user's mobile phone will scan signals from known locations-Bluetooth beacons and will determine the "user's" location on the local mall map (the same way as a GPS) with accuracy of less than 5m. (More beacons with LESS signal range=more accuracy)

[00431][00430] For example, the Bluetooth beacon can broadcast an RF signal that includes its position coordinates (e.g., latitude, longitude), which can be detected by a mobile device. The position coordinates can provide a third location accuracy for the current location of the mobile device by virtue of the mobile device adopting the position coordinates of the beacon as its own position coordinates.

[00432][00431] The known locations of a number of beacons in a geographic region (hereafter a “beacon infrastructure”) can define a geofence that encompasses the geographic region.

[00433][00432] In some implementations, the beacon can also advertise location based services provided by the beacon infrastructure. Upon determining that the mobile device crossed the geofence defined by the beacon infrastructure. The application can monitor for beacon signals and continuously update its location to be the location of the beacon currently in proximity with the mobile device.

[00434][00433] When the mobile device loses contact with the beacon for a defined period of time (e.g., 5,10 minutes) or when the mobile device exits the geofence defined by the beacon infrastructure, the application can transfer the monitoring back to the application subsystem, so that the location of the mobile device can be determined using Wi-Fi and or Cellular ID.

[00435][00434] In some implementations, the application can distinguish between beacons in the beacon infrastructure and mobile beacons that may be detected in a scan, such as other Bluetooth enabled mobile phones operating within the beacon infrastructure.

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~~[00436]~~[00435] For example, each beacon in the beacon infrastructure can provide data in its broadcast signal that indicates that the beacon is part of a beacon infrastructure.

~~[00437]~~[00436] Alternatively, or in addition, when a mobile device makes first contact with a beacon in the beacon infrastructure, that beacon can transmit to the mobile device a list of unique identifiers (e.g. beacons ID) of other beacons in the beacon close infrastructure and other information about the beacon infrastructure, such as a name, geofence data, one or more websites associated with the beacon infrastructure.

~~[00438]~~[00437] Beacon infrastructure can be located in any geographic region, including businesses (e.g., shopping malls, retail stores, restaurants), landmarks (e.g., museums, airports, parks, entertainment venues) and any other environments where location based services are desired.

~~[00439]~~[00438] The available local advertising marketing is huge with over $150 billion in revenue in the US alone.

~~[00440]~~[00439] Indoor LBS Applications

~~[00441]~~[00440] This is a concept that offers a complete suite of application from finding parking to navigation of indoor malls\stores and with a capacity to navigate to emergency exits with a low cost to implement and with a business model that can be used to attract customers.

~~[00442]~~[00441] The application represents a big opportunity in the navigation market and will open up new avenues for companies from telephone operators to mall/store/department storeowners to navigation and mapping companies.

~~[00443]~~[00442] The disclosed technology presents a low cost and easily deployed infrastructure for local based navigation outdoors and indoors without the need for GPS and or cellular networks. Moreover, the concept is especially suitable for local area (indoor and outdoor) services when and where the GPS and the cellular network can't provide the solution and the accuracy needed to provide such navigation (1OM or less).

~~[00444]~~[00443] The disclosed technology provides a system is based on existing Bluetooth, a technology that is proven to be stable, simple, inexpensive and mature in market

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use. Moreover, it is a common communication tool and is available on more than 85% of all new mobile phones.

[00445][00444] System Architecture:

[00446][00445] The infrastructure consists of RF Bluetooth beacons installed in known locations in a local area. The beacons will respond to Bluetooth device scanning inquiries made by "user's" Bluetooth enabled cellular phone or other Bluetooth device with a the special application.

[00447][00446] Each of the RF beacon are ID that represent the Location ID as well as represent the facility/product type. A mobile device as well as any Bluetooth device (desktop, laptop, tablet and cars etc.) can become also a beacon providing a new echo system where an infrastructure can include static and dynamic deployments of beacons interact with each other's.

[00448][00447] The local area map (mall map, store, building map, area map etc....) will be available to be downloaded as part of a mapping system that can be triggered to download at the entrance of the building/mall/area or the directory to provide the mapping for the navigation or as part of a mapping and navigation application.

[00449][00448] A "user's" Bluetooth cellular phone will scan the local area for the location beacons. When a "user" is within 5/10 meters, the location beacons respond, providing room-level navigation accuracy. The beacon ID as well with signal strength will provides instant localization determination, with multiple beacons installed and possibly receiving more than one beacon's signal, a simple triangulation calculation and options for signal strength will determine the exact location of the "user" on the downloaded map of the local area. Note that there is no communication establish between the beacons and the mobile phone (no pairing), and that no connections to the Internet are necessary (even so to be provide with more information you may need Internet).

[00450][00449] Other signals not on the list will be ignored, There is a mixed use of beacons and delivery option depending on the application (for example in a mall application, the stores can have a WAP or use the Internet to automatically deliver more content push to a "user's" mobile device where the beacons serve as navigation "antennae" as well as trigger

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mechanism to provides application exploit and waypoints contents to help the "user" navigate in the area. Application can be: Sales Sense-Next Generation Marketing Tools: the Behavioral Module, Nav4Parking,Nav4Realty, Nav4Mall, Nav4Sale, Nav4Museurn, Nav4Show, Nav4Train, Nav4Sign, Nav4Emergency, Return2Parking, Nav4Store, Nav4Conference, Nav4Disney, Nav4Events,

~~[00454]~~[00450] Moreover, according to research, indoor navigation may be more important than outdoor navigation and may represent a huge new market.

~~[00452]~~[00451] The technology disclosed herein enables shopping centers, malls, department stores, buildings, airports, train stations, exhibition centers, museums, and amusement parks to understand the way that their customers or passengers flow through their premises. At the same time it provides the user/shopper with unique indoor navigation capability without compromising user privacy.

~~[00453]~~[00452] The innovation disclosed herein enables, for the first time, the navigation and GPS industry to tap into the local advertising market, estimated to be $150 Billion in the US alone.

~~[00454]~~[00453] The technology disclosed herein provides a reliable method for identifying the path habits and the behavior that people take through an area.

~~[00455]~~[00454] There are a number of advantages to the technology disclosed herein, including:

Extremely large sample size as mobile penetration is above 90%

Shoppers remain anonymous accurate to within 5 m

Based on a Bluetooth technology

~~[00456]~~[00455] For retail areas, malls in particular, the advantages of understanding shopper behavior are significant. Such information can assist the mall to:

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~~[00457]~~[00456] Evaluate and improve their retail tenancy mix by identifying which stores shoppers consider complementary. The device/cellular phone is the one that scans and tracks tags/beacons along the route, each scan includes the cell's unique Bluetooth ID, and while these ID'S help track the movement of the signal and its owner, they don't reveal the identity of the user. This is a more precise method than what Google maps uses to detect a general location on a mobile phone by cell towers which are accurate between 300-1000 meters compared to accuracy of the disclosed technology which is below 10 meters.

~~[00458]~~[00457] Some reports about shoppers show how valuable behavioral information actually is and the profit opportunities that come along with this:

~~[00459]~~[00458] Where they go, Where they go next, Where they do what, When they do what, who does what?

~~[00460]~~[00459] Understand behavioral patterns across demographics. Similarities, differences and much more.

~~[00461]~~[00460] Sales Sense User Preference Module

~~[00462]~~[00461] Every day millions of people access the Internet and enter their profile, personal information, or answer questions about their preferences in order to access a service/site, to get to a mall, identify underutilized areas in the mall, understand the impact of anchor stores on the incentives, coupons, specials, etc.... The sites use the information for marketing and in some cases, share or sell the information. Recent research has found that most people:

~~[00463]~~[00462] Measure the implications of particular promotions or center events

~~[00464]~~[00463] Assist with planning day-to-day mall operations

~~[00465]~~[00464] Provide add-ons for the shoppers

~~[00466]~~[00465] Provide shoppers with a "web" like shopping experience

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[00467][00466] Provide shoppers with incentive/advertising and automatic check-in method

[00468][00467] Increase security

[00469][00468] And in an emergency provide the shoppers with alarm and notification

[00470][00469] The disclosed technology is the only system known today that can gather information on shopper paths continuously and accurately using a RF Bluetooth or Wi-Fi beacon technology and all without compromising the shopper ID or his privacy.

[00471][00470] The disclosed unique and innovative system and method which can also provide a way of surveying the behavior and preferences of the "user" shopper simply by observing the signals (Bluetooth beacon ID) associate with their mobile phones and at the same time provide the shopper with a unique special application for indoor navigation and local based service for the benefit of the shopper and the business owner.

[00472][00471] The data collected using the technology can be used to provide trend reports showing which shops are most visited and at what times, whether there are sufficient public facilities to serve the visiting shoppers or whether more security staff are needed to name only a few of the potential benefits. Ultimately, the data made available by the disclosed invention helps shopping centers to become more in-tune with their customers so that they can create better, more pleasant places to visit by providing a loyalty and reward program.

[00473][00472] Analytics provided by the disclosed applications can turn shopping center/department store/store into finely tuned sites, enabling mall/store owners to direct the flow of traffic efficiently around.

[00474][00473] In contrast to alternative techniques, there is no device that tracks the user's cellular phone. In the disclosed method the user is willing to give information for incentives.

[00475][00474] Using the profile and records, the surfing habits of the user (IP) is the way that all the search engine companies make money on the Internet. At the same time they try to direct the content to the user according to their profile/habits. But what about real life? People

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spend more and more time indoors (according to recent research, people spend more than 90% of their time indoors).

[00476][00475] As part of the blue umbrella suite of location based services (LBS) application, the user's cellular phone will scan the area for the tags/beacons. For example-by being proximity close to the directory stand in a mall a decoding of the user key will be processed in order to allow the user ID and/or preference profile and provide the user with ads, specials, and incentives according to their profile "Your customer is telling you what they want, are you listening?"

[00477][00476] The main idea behind this is to provide the user with pin-point content according to their desired preference at the location and also direct/navigate them to the desired location where they can find the store/sales/special/coupons or the information that they are looking for. At the same time there is also a benefit to the mall/store owner by getting the next generation's sales tools, getting costumers' habits and their sales profile, and able to serve better and accordingly the costumers.

[00478][00477] The sales sense, user preference module is an add- on to the sales sense marketing where it joins the user behaviors module to create a very unique LBS business and marketing model the analysis of these spatiotemporal data can supply high level human behavior information valuable to urban planners, local businesses, and the Local Based Services (LBS) marketing.

[00479][00478] Mall/department store/store indoor applications are part of nav4mall/store

[00480][00479] The indoor applications and navigation takes a further step to give the user/shopper next generation shopping tools by providing them with the following indoor applications that are part of nav4mall/store.

[00481][00480] Map and indoor Navigation-brings the local mall/ store map to the digital age, allowing the user to navigate from waypoints to waypoints on the map Directory- It brings the store/mall directory to the cellular phone. Search and Find-store/place/item products that are on the directory represent waypoints/tags/beacons on the loading maps.

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[00482][00481] Sales/specials-discounts, sales, and coupons, that can be added-on or a replacement for the mall/store flyer that provides the shoppers at points in the mall/store, it can even direct the user/ shopper to the aisle with the products and to coupons and directs the shoppers to what they looking for.

[00483][00482] Parking and return2parking- although not directly the same beacons (for the parking the infrastructure employs long range beacons where in a store/mall the beacons can be a shorter range). The disclosed service allows the user to find parking spaces and location of parked cars.

[00484][00483] Info-the information part can provide information about events, restrooms, ATM locations, seating area, kids playground, fountain, public phones etc....

[00485][00484] Emergency-A very important part of the disclosed innovation is the ability to provide the user with a unique alarm and notification to the user without depending on other communication links like cellular phones that are prone to failure in emergencies. The present invention provides the user with the building/mall/store/place emergency procedure and in emergency will help navigate the user to safety.

[00486][00485] Panic-part of nav4emergency allows the user to request being located in an emergency.

[00487][00486] Privacy: The system does not collect personal information such as name or phone number. It does, however, record the phone's Bluetooth identification number to build a profile of the user or the use of the phone in the area. It is like surfing the web where a "user's" IP address is recorded for future marketing statistics and surfing habits (with permission from the user). Also as part of the encoding key into the Bluetooth device (user profile) as described in the sale sense part the privacy and security increases to the level where viewing the key broadcast by the Bluetooth device can't reveal any user identity unless the user requests to be registered to get incentive, specials, sales, etc., even then his name or other personal information is secure and only the Bluetooth device key/ ID are recorded.

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[00488][00487] By directly targeting the consumer standing right outside or inside a business, an event, or walking toward a kiosk or restaurant, merchants can maximize their marketing budget while incorporating a new, inexpensive and effective form of advertising.

[00489][00488] The "user" is in complete control. They can disable their Bluetooth application any time or just reject content, there is no "spam" effect and the "user" is attracted by incentives rather than generic promotions. In a mall-like environment a "user's" incentive to use the disclosed technology can be further enhanced with the use of the associated key advantages and packages.

[00490][00489] Isn't this all a bit like "big brother"? Not at all, and it isn't even "little brother"! The system simply logs the movement of a cellular phone around an area and aggregates this to provide trend data for businesses. It's much less intrusive or invasive than existing methods that are already in widespread use-for instance CCTV cameras and number plate monitoring as they do collect personal information such as your image or car number plate. The disclosed technology represents the next generation shopping experience in shopping centers, malls or stores and fits very well with today's business model. Such a service can be offered for free to the "users" and backed by advertising and the use of the data by the stores. Such service and application and the ability to include the full "suite" of applications especially designed for shopping malls/stores and including the emergency part of it will also ease the fear of "locating" or any other privacy issue.

[00491][00490] Who benefits from the disclosed technology? Everyone benefits from the trend data collected. The process enables a way to collect instant feedback from shoppers without having to bother them for information. In the old days centers would have used researchers to survey consumers but this information takes time to collate and response rates are very low these days as shoppers have increasingly become reluctant to stop and share their feedback. Hence the disclosed innovation provides a very effective method in the same way that TV networks know how many people watched particular programs and use that information to discern what programs to make and how to calculate the costs advertisers must pay to promote their products during different timeslots, the system provides the equivalent for shopping center owners and their resident retailers. It is believed that introducing the proposed system and

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marketing tools above can help users and merchants upgrade the real shopping experience of today with the advantage of the web like tools.

[00492][00491] The disclosed innovation represents the next generation shopping experience in shopping centers and malls and fits very well within today's business model. Such a service can be offered for free to the "users" and backed by advertising and the use of the data by the stores. Such service and application and the ability to include, the emergency part of it will also ease the fear of "locating" or any privacy issue.

[00493][00492] For the first time the shopper will experience Internet type marketing in the traditional sales and advertising venue.

[00494][00493] Here are the benefits consumers could see from shopping center using the disclosed technology:

Better in-mall events-- the system can monitor how successful they were by monitoring the sheer volumes of people attending and for how long.

Provide shoppers with next generation sales tools: navigation in your mall store facility directly to the sales or specials that you want them to go to ....

Add-on to the store/mall directory and the in-store mall flyer.

Take the guessing from the customer's next want ...and then send them directly to the products, coupons, or specials they might want.

Improved public transport links-by monitoring how people traveled to a center. With the government's current emphasis on helping people to use public transport more effectively, having this kind of information can have a very positive, local environmental impact. Busy shopping centers can otherwise create large volumes of extra road traffic, also with the search4parking and return2parking application improves traffic, saving time and gas.

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Eliminates congestion within the shopping center-- the disclosed innovation can help center management understand whether opening hours need to be extended or whether the center layout needs to be improved to avoid congestion.

Improves shopping center and public facilities efficiently- the disclosed innovation's data helps managers to understand which parts of their facility are very busy which means they know when to deploy extra employee/cleaners/security to ensure proper service.

Better security--over-crowding also leaves shoppers vulnerable to pickpockets and other security risks. The disclosed system can identify congested areas and ensure security personnel are deployed appropriately. And in an emergency the disclosed system can provide instant alarm and notification even if the cellular communication or other system is not available.

Improved mix of stores and center layout-the system helps identify which stores are popular and which are not- making sure that the best possible layout and mix of shops is provided for visiting shoppers. If some shops are unpopular they can be switched for brands that customers actually want.

[00495] [00494] It is believed that shopping should be an enjoyable pastime. Who wants to go to shopping center that are congested, poorly laid out, have dirty toilets, are badly positioned for transport links and which pose a security threat to visitors? Altogether this makes for a much better shopping experience.

[00496] [00495] How do shopping center owners and retailers benefit? The benefits for shopping center owners of using the disclosed technology are huge and there are many possible uses for the information gathered. The disclosed applications can help shopping center owners get a better understanding of how people use their center such as the order of stores they visit and the time they spend in different areas of the center.

[00497] [00496] These days, visits to shopping malls are falling with increased competition from supermarkets, retail parks, and the Internet. With visit frequency going down it is critical that the shopper experience at the mall is exceptional and that is where the disclosed applications come in. The information can assists malls at all levels, from the very mundane to the more

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strategic questions that they face-such as whether or not they have the right mix of retailers across the mall.

[00498][00497] Similarly it could help museums identify their most popular exhibits and help exhibition companies plan their venues more carefully around visitor traffic flows.

[00499][00498] The disclosed technology is able to provide a solution with quantitative feedback on whether the changes they make in the mall are successful. One of the ways to do this is by looking simply at how long shoppers tend to stay within a mall.

[00500][00499] Don't retailers already measure shopper numbers? Yes they have infrared cameras and counting machines, which monitor and count the numbers of visitors to their stores. This measure is known as "footfall" and has been used by retailers for many years. The disclosed system provides another level of data by looking at the aggregate paths that mobile phone carrying visitors take and the length of time they spend-known as "dwell time".

[00501][00500] In the past malls have focused solely on looking at the numbers of shoppers that they are drawing through the doors (footfall) but when combined with dwell time they can get a much more accurate predictor of their performance.

[00502][00501] The system has no idea who the user is an individual. The system only looks at the path the user's phone takes. Essentially, it's like looking at a dot moving around a screen. In isolation this information isn't too interesting until you look at the wider patterns and trends and see lots of dots taking the same route or visiting the same areas of the mall.

[00503][00502] What is the Bluetooth ID number? A Bluetooth ID is like the IP number in a computer network or the Internet which does not contain or reveal your phone number that the network operator uses to identify your phone. The system utilized the ID information as a key to find and detect the user.

[00504][00503] The linkage between this identifier and your personal information is very critical to the business owner as it can provides a user habit preference profile and provides a new breed of tools to the business owner just by getting to know where the user is, and at the same time to provide the user with the best “VIP” like personalize shopping services.

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[00505][00504] The disclosed applications do not detect any personal information and have absolutely no idea who you are as an individual. Although the applications include an option for users to register as mall/store customers to provide more details about you (still no real ID), like a membership cards that will be provide the user with incentives, coupons, or special discounts if they participate. Moreover recent emergency events prove the need for emergency and notification to the "right people" at the "right time", by keeping the key/ID of the Bluetooth devices that are in the area/facility the disclosed nav4emergency can provide instant alarming and notification and navigation to the exit route and to safety all without revealing user ID or breaching privacy of the users.

[00506][00505] The business model-Next Generation Marketing: The web advertising and the main focus of search engine success is based on technology that tracks the web user's habits and provides him with related ads according to his interests.

[00507][00506] Using the disclosed infrastructure of a Bluetooth beacons, wherein the beacons are deployed about in a mall, store or shopping center environment. The disclosed invention represents a very unique ability to bring a web like shopping experience by its ability to keep up on the "user's" "surfing" or shopping habits in the shopping center, mall, or store. It will provide a better shopping experience (coupons, specials sales, according to the user's shopping habits) and service to the shopper.

[00508][00507] Even though it may look like a privacy issue, the add-on services, the application, and the idea that it may save the user's life (nav4emergency application) combined with the fact that it does not reveal the person's name or telephone number, it is the same as the everyday use of surfing the Internet when the user's IP is recorded by the web sites and provides the basis for the "ad sense" or the web marketing tools, referred to as a "sale-sense".

[00509][00508] It is believed that introducing the disclosed system and the associated marketing tools above can help the users and the sellers to upgrade the real shopping experience of today with the advantage of the web like tools.

[00510][00509] The disclosed innovation represents the next generation shopping experience in shopping centers, malls and fits very well with today's business model. Such a

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service can be offered for free to the "users" and backed by advertising and the use of the data by the stores. Such service and application and the ability to include the emergency part of it will also ease the fear of "locating" or any privacy issue.

[0051~~1~~][0051~~0~~] For the first time the shopper will experience Internet type marketing in the traditional sales and advertising venue.

[0051~~2~~][0051~~1~~] The disclosed innovation provides valuable solutions that enhance the effectiveness of ad campaigns. The ability to optimize performance in real time has a positive effect on advertiser satisfaction. The fact that this service is well integrated into the disclosed system is a tremendous advantage.

[0051~~3~~][0051~~2~~] The disclosed innovation is a performance-enhancing technology, providing great data and allowing improved customer service.

[0051~~4~~][0051~~3~~] It can be an extremely effective way to optimize the performance of offline/online advertising campaigns in the mall/store environment. For excellence in client services the idea is a clear win-win for everyone.

[0051~~5~~][0051~~4~~] Helping to understand where users are going in the mall/store in real life and their buying behavior patterns will allow the merchants to continually adjust offers, placements and creative content to improve buy-through and maximize sales.

[0051~~6~~][0051~~5~~] The disclosed technology will evolve mobile content into a bonfire revenue center that will benefit the shopping mall operator and merchants alike.

[0051~~7~~][0051~~6~~] The "user" is in complete control. He can disable his Bluetooth application- any time or just reject content, there is no "spam" effect and the "user" is attracted by incentives rather than generic promotions. Probably the best technical analogy would be to compare the disclosed technology with existing web-based systems that measure viewers of web sites, for example Google Analytics.

[0051~~8~~][0051~~7~~] For example, the Bluetooth beacon can broadcast an RF signal that includes its position coordinates (e.g., latitude, longitude), which can be detected by a mobile device. The position coordinates can provide a third location accuracy for the current location of

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the mobile device by virtue of the mobile device adopting the position coordinates of the beacon as its own position coordinates.

~~[00519]~~[00518] The known locations of a number of beacons in a geographic region (hereafter a "beacon infrastructure") can define a geofence that encompasses the geographic region. In some implementations, the beacon can also advertise location based services provided by the beacon infrastructure. Upon determining that the mobile device crossed the geofence defined by the beacon infrastructure. The application can monitor for beacon signals and continuously update its location to be the location of the beacon currently in proximity with the mobile device.

~~[00520]~~[00519] When the mobile device loses contact with the beacon for a defined period of time (e.g., 5,10 minutes) or when the mobile device exits the geofence defined by the beacon infrastructure, the application can transfer the monitoring back to the application subsystem, so that the location of the mobile device can be determined using Wi-Fi and or Cellular ID.

~~[00521]~~[00520] In some implementations, the application can distinguish between beacons in the beacon infrastructure and mobile beacons that may be detected in a scan, such as other Bluetooth enabled mobile phones operating within the beacon infrastructure.

~~[00522]~~[00521] For example, each beacon in the beacon infrastructure can provide data in its broadcast signal that indicates that the beacon is part of a beacon infrastructure. Alternatively, or in addition, when a mobile device makes first contact with a beacon in the beacon infrastructure, that beacon can transmit to the mobile device a list of unique identifiers (e.g. beacons ID) of other beacons in the beacon close infrastructure and other information about the beacon infrastructure, such as a name, geofence data, one or more URLs to websites associated with the beacon infrastructure. Beacon infrastructure can be located in any geographic region, including businesses (e.g., shopping malls, retail stores, restaurants), landmarks (e.g., museums, airports, parks, entertainment venues) and any other environments where location based services are desired.

~~[00523]~~[00522] The system use and costs should scale well with its ability for multi-use in an emergency and in a non-emergency to provide local navigation on malls/store campuses,

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buildings, hospitals, hotels, malls etc.... using the Bluetooth beacon for navigation. Some of the key applications are:

[00524][00523] NAV4Mall NAV4Store NAV4Sale or just University or Building Navigator, explore the indoor mall or inside a department store, navigate to the right place or the store or the department that you need. Navigate on the mall map/store mapping to find your way around all using your cellular phone or navigation system without a GPS. A new kind of service and new marketing way for the malls/store business owners, an add-on to local advertising.

[00525][00524] With an indoor navigation based on the local map/ mall that will provide the user a navigation to his desired location in the mall/store and receives content according to his preferences or habits the user can be directed to a store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. The store will have also an option to deliver more content (advertising, sale, coupons, promo etc....) to the user when he approaches the store or already is inside via Bluetooth or Internet push to the user cellular Bluetooth enable. And in emergency-the nav4emergency will kick in, the nav4store mall module is the one that is described in more details in the patent application.

[00526][00525] NAV4Museum NAV4Conference NAV4Show, explore museums or conference show exhibits in a new unique and easy way, find your way around when navigating on the floor map of the museum conference or the show, indoor navigation, navigate to exhibits restaurants, cafes, lavatories etc.... all to the "user" navigation or cellular phone. Any Museum Conference or show provided to the attended a mapping to the exhibits, some provide also additional audio device (headset) to get more information on the exhibits. The disclosed innovation will provide a unique indoor tools that will allow the attended to navigate the museum, conference or show in an easy way directly to his Bluetooth enabled cellular phone, when he reaches his desired exhibit he will be allowed to download directly to his cellular and or Bluetooth headset information about the exhibits. An indoor navigation to the exhibits as well to the restaurants, cafes, lavatories etc.... All to the "user" navigation or cellular phone and based on the facility map. And in emergency-the nav4emergency will kick in.

[00527][00526] For all the users of mass transportation system the disclosed innovation will allow, locate, and point the "user" to the exact station or location on a route, an easy way to

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navigate in the train, subway, underground kind of system, a new way of "subway" or bus mapping in/out door and directly to the user's navigation or his cellular phone. Every day millions of people are using the mass transportation system, trains, sub- ways, buses, each of the passengers depend on the transportation map for the route information as well as schedules and additional services provided by the transportation system. Most of the passengers of today carry with them a cellular phone.

[00528][00527] Such method can be used by the management of the transportation system, train, buses, taxi and road management where the RF beacons can be installed in any transportation facility or entity to provides traffic and even on-demand transportation request as well as on-line real time traffic and transportation "head count" of the mobile device exiting in the local area according to associate with a proximity beacons installed in the transportation entity of transportation infrastructure ether parking, traffic, sign, schedules and time to station and traffic – how many people at the station or bus stop or at area to create a need to taxi or public services as on-demand service.

[00529][00528] Aside from such data gathering and the important of such statistically information to manage the flow of transportation in a local area where the beacon serve as "sensor" to detect the traffic in specific area to be monitored by collecting how many device are in that location and in event of emergency can provide emergency notification and alarming the local devices.

[00530][00529] The method explained can be used to manage the transportation and provides automatic awareness into transportation managements and operators as well as the user on the road where he can automatically get information about traffic in his area generated from associates, his cellular id and/or the car Vin broadcasting method (a method where the car himself become an a long range RF beacon) and an RF beacon installed on the road – automatic traffic information that tracks the existence of the user in the area and proximity to a beacons installed in the road/transportation facility (even the traffic at intersection). infrastructure of wireless beacons to the benefit of transportation industry managements by providing automatic crowd sourcing data from the users along the road By delivering the beacons id they proximity to and have it statistically view as data guttering for events like traffic on the road automatically,

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adding such technology and infrastructure into the roads may take time so the use of the driver and passenger or the pedestrian cellular phone as a beacon and as automatic traffic notification can provide instant infrastructure- dynamic immediate deployment for the benefit of the transportation as well as the drivers in view of the driver and or the passenger and even the car can be set as a beacon and part of the automatic transportation system to alert for traffic and road safety and even for a car to car automatic notification of traffic and road information.

[00534][00530] The disclosed innovation provides the passenger with the navigation inside the transportation system directly to the passenger's Bluetooth enabled phone; the passenger will know the exact location/station on the route as well as additional information on options like schedules. A new add-on service to the transportation providers as well to the passengers utilizes the disclosed indoor navigation method, and in an emergency-the nav4emergency will kick in.

[00532][00531] The disclosed idea of implementing RF beacons alone the roads and in transportation facilities is designed to reduce the growing congestion on the roads and by providing a tools to provides intelligent transportation system, the implements of beacons can be part of a car, installed in red lights or in the road or in transportation facility, such system that installed in bus or subway or transportation entity n provides real time on line report if they empty or filled with travelers but just provide the automatic response from the user/car device associate with the RF beacons that will be installed in the bus/train the information will allow transportation control that can be done today only with installed high cost camera or sensors or depend on manually collect information from the users or GPS, and the GPS is not available indoor or provides an accurate information, in a simple way the user mobile phone automatically inform his “proximity” beacon ID, more of the same beacon ID reported meaning traffic or head count of cars/travelers etc.. in the transportation facility/entity area, in a way the method provides an “automatic waze” system, such system can even replace exiting sensors and provides the user as well of the transportation management with ability to know exactly where the bus/train/subway at a time, the data can be serve for schedule or on-demand public transportation, like sending bus/taxi to an area according to demand in the area. Such method can provide the user as add-on traffic and transportation information where he – the user play big part of it and it is not depend on manual transfer of information that some time proven to be not

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accurate enough. One application creates an echo system where the drivers of cars and the transportation entity are all integrated for an intelligent transportation system of tomorrow and all based on the same concept of infrastructure on RF beacons statics or dynamic in location where the user mobile phone as well as the car are integrated part of such system. Note that a mobile device as well as any Bluetooth device (desktop, laptop, tablet and cars etc.) can become also a beacon providing a new echo system where an infrastructure can be including static and dynamic deployments of beacons interact with each other's. Again, adding such technology and infrastructure into the roads may take time so the use of the driver and passenger or the pedestrian cellular phone as a beacon and as automatic traffic notification can provide instant infrastructure- dynamic immediate deployment for the benefit of the transportation as well as the drivers.

[00533][00532] NAV4Theme Park -Theme and amusements Park navigation, navigate to your desire attractions as well with a new way for register to a "fast pass" kind off lane all in an easy way to the "user" cellular phone without the need for GPS Provides a new media and-on service. Ever wonder what it will be like to navigate inside the amusements park to the desired attraction, to know the schedules of the shows at the attractions and even to get your "fast pass" from a remote location instead of standing in line. All based on RF beacons that installed in the local attraction points and provides the triggering mechanism for guide navigation and the additional information about the ride/attraction. With the disclosed unique innovation, all can be become reality and directly to your cellular phone without the need for a GPS. It is understood that this technology can provide a new tool and service to the benefit of the amusements parks as well to the user.

[00534][00533] Cellular next "Killer Application": Emerging technology markets are always on the lookout for that elusive "killer app"-the precious, irrefutable application that makes adopters stand up, take notice, and open their wallets. Once it's found, and as soon as adopters realize firsthand the value to be achieved, that killer application eventually expands into other, more advanced areas of adoption and innovation.

[00535][00534] Hotel resort and cruise ship: A good example of use will be Nav4 Hotel Resort Cruise ship. The benefit of the proposed system and infrastructure of installed RF beacons

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in such places as cruise ships, hotels, resorts, and hospitality facilities to the business and to the guest.

~~[00536]~~[00535] The subject invention creates infrastructure of RF beacons in the facility, hotel, resort, and cruise ship areas to be integrated with the existing hospitality system and provide a trigger mechanism when the existence of the traveler/guest is detected.

~~[00537]~~[00536] The association between the guest mobile phone or the hospitality employee mobile phone and the RF beacons ID will allow the example option below, as such there is two parts for the system to work, the infrastructure of the RF beacons installed in the local hotel, resort or cruise ship and the guest or employee mobile phone with the Bluetooth and or Wi-Fi and the application, note that the system can be work even without Internet and/or cellular communication and can utilize existing Wi-Fi system and local servers.

~~[00538]~~[00537] Example of some of the benefits and functionality to the hospitality system are:

Automatic check-in and interface to the front office system and billing folio

Link to key system or even replace the room key.

Recognize guest in-room, turn on Air condition and light – and turn off when the guest leaves the room to save electricity can be setup to automatic or manual.

Hotel resort cruise ship navigation.

Allow local messaging without Internet and or cellular communication based on local chat (especially fit to the cruise ships).

Allow push messaging to the guest by local services or by remote (when Internet is available).

Replace and ad-on to the guest in –room package of the area guide and deals and coupons.

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Option of VIP services where the guest can be recognized automatically around the hotel, resort, and cruise ship for his profile preferences just by being in the area – providing personal treatment and services.

Room can be set to be open or close to clean according to guest or housekeeping existence.

Housekeeping management room status attended worksheet and productivity report.

Increase security to the guest and to the hotel resort.

Allow the creation of profile preference of the guest companies group.

Provide check-in to a restaurant interface to a POS system bar system and menu selections.

Provide automatic ticketing and seat selection.

Guest loyalty, membership program incentive.

Increase security and provide add on to the security plan of the hotel, resort, and cruise ship to be part of the emergency evacuation and emergency procedure.

~~[00539]~~[00538] It is believed that the disclosed invention will meet the desire of hospitality service providers to increase their average revenue per user.

~~[00540]~~[00539] The main object of the present invention is to provide the indoor guide navigation and a special application for indoor use without the need for GPS communication.

~~[00541]~~[00540] It another object of the present invention to provide a method of providing special indoor application using an RF beacons Bluetooth and/or Wi-Fi and Bluetooth-enabled devices especially the cellular phone.

~~[00542]~~[00541] It is another object of the present invention to provide a method of special application for local business, mall/departments store or regular store, buildings, downtown

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centers and other facility area especially but not limited to indoors with a use of triggering application that uses the proximity ID of the detected beacons in the area.

[00543][00542] It is another object of the present invention to provide a marketing model method especially but not limited for the LBS market.

[00544][00543] It is another object of the present invention to provide a business model method especially but not limited for the LBS market.

[00545][00544] The foregoing and other objects of the present invention are achieved by providing an infrastructure of a Bluetooth beacons/tags installed in a known location in the area/facility, each tag/beacon has his own unique ID to ID the location in the area, the tags/beacons broadcast the ID to be pickup by the cellular Bluetooth mobile device.

[00546][00545] An indoor mapping or mapping images of the area/facility will be part of the application and can be download before arriving to the area/ facility or trigger download at the area.

[00547][00546] The application on the cellular phone/Bluetooth enabled device will scan the area/facility for the tags/beacons ID/name when a Bluetooth tag that matches the list responds to proximity detection and establishes a signal strength that may be calculated and when more than one beacon signal receives a simple triangulation can be done to find the current location. Other Bluetooth device not on the list will be filtered out.

[00548][00547] The locating is established and will be displayed on the map. And because the location of the other tags/beacons is known navigation between the current location and a desired tag/beacons that represent waypoints are easy to achieve. In reality no communication is established at all between the tags/beacons and the cellular phone.

[00549][00548] The disclosed innovation reverses the current idea of "locating" the user by letting the user navigate utilizing to the beacons of Bluetooth beacons (whose signal is sent by way points) directly to the user's mobile device. This will allow LBS (Local Base System) navigation, even indoors without GPS or Cellular network as well as triggering application and even link to existing system and software.

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[00550][00549] The RF beacons can reach from long distance depending on the application and the antenna used by the RF beacon (to get more accuracy less range and more beacons may needed so the 10 m is more than needed in building/room environment) getting more range to the "box" is as simple as attaching a bigger antenna or power buster to increase the signal.

[00551][00550] The user is in a complete control, they have the choice to turn it on or off at any time.

[00552][00551] User can choose to be registered: membership privilege, student in a university, school, and business especially for receiving direct incentive specials coupons etc.... and for a full nav4emergency protection.

[00553][00552] The disclosed applications let the user choose between participating and receiving incentives, specials, sales, coupons and local content tailor to the user preference, all for free, or they can choose not to participate and pay a small fee for the service and the software. In any case the user's privacy is still protected to the highest level compared to any normal daily use of the Internet ...!

[00554][00553] There is also a great benefit to the user participating-they can have full emergency notification directly to their phone and in an emergency they can be directed by the emergency procedure in the area/building/mall/store and navigate to the exit route, even if the cellular network fails due to the high volume of traffic occurring in an emergency situation.

[00555][00554] In the disclosed method, there is no detector or tracking for the user, the user themselves engage the scanning and detecting method to find the beacons in the area the user device with the proximity scan beacon providing the triggering mechanism.

[00556][00555] Other than that, the proposed solutions create a full suite of applications for the benefit of the user, from parking to sales specials to indoor navigation, to be informed and notified in case of an emergency and directed to the exit route to safety.

[00557][00556] The disclosed method can be attractive not only for shopping malls, department stores, or downtown strips but also to high-rise buildings, commercial buildings,

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universities, schools, museums, amusements parks, trains, subways, and hotels. It can also be attractive to search engines, advertising companies, cellular phone operators, manufactures, GPS companies, mapping, local businesses, local advertising, location based services (LBS), and the like. The disclosed method can give the LBS a new meaning-the business model that's made easy.

[00558][00557] A facet of behavioral targeting has been around for a while but mostly on-line but it's been gaining traction among ad agencies retargeting program is now a key planning consideration for its advertisers.

[00559][00558] Why? The primary reason is because retargeting is a powerful means to bring lift to ad campaign results, generating higher conversion rates and lowering acquisition costs. You can't get much more effective than targeting a person who has shown interest in a product but didn't buy with a related ad that then gets him to buy, right? It generally fails to tap the unique opportunities of local advertising market estimates to be over $150 Billion in US alone . . ., Although people are spending more than 90% of their time indoor, there is no clear technology to provide indoor navigation and not clear business model, the advertisers, the business are disillusioned with the promise of location base services (LBS) but are still longing for a solution that properly addresses the significant audience represented by the explosion of cellular phones use and the availability of content.

[00560][00559] It is understood that the disclosed innovation technology and business model can provide the next generation method for the LBS market to tap into the huge market opportunities.

[00561][00560] The disclosed methods represent a very unique way of locating the exact location, in the method the user scans the area for a known list of beacons/tags, the user controls the scanning of the area for the known tags ID type, in reality there is no communication to be established at all between the user and the beacons (no pairing needed!), the user device scans the area for a known tags and the determination of the location done by beacon ID and signal strength to the proximity to the tag/beacon provides accuracy less than 5m.

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[00562][00561] Added to the navigation feature is the special indoor application design especially for indoor/store/mall shoppers from finding where the user parked his car to find/search of directory to an emergency alarming and notification.

[00563][00562] Moreover this innovation is not depended on cell communication or Internet for the detection method as there is no need for central system nor expensive infrastructure, in fact the user device-cellular phone as well with the infrastructure tags/beacons have battery built in and can work even if the electricity is out, very important in emergency situations.

[00564][00563] Moreover the sale sense marketing method comprising a unique way of delivering local content, advertising, coupons, special sales etc. pin point according to user ID and or profile preference that can be a record of behavioral activity and will provide simple and secure method for targeting user for LBS services and other services replacing like near field communication for marketing and even payments transactions.

[00565][00564] The disclosed innovation provides a full line of indoor navigation application especially to places/area

[00566][00565] An indoor navigation system may include a navigation computer, an arrival detection system. The navigation computer may be configured to receive a destination to which a user of the mobile navigation system wishes to travel and to provide guidance to the user about how to navigate to the destination. The arrival detection system may be configured to automatically detect when the mobile navigation system has arrived at the destination by being in a proximity to an RF beacon ID in the local area. The detection system is based on sense or scan of the existence of RF beacons installed in the local and be configured to wirelessly transmit automatically an arrival notice indicating when the user detects the existence of a proximity of a RF beacon and detects that the user has arrived at the destination in response to detection by the detection system of the arrival of the mobile navigation system at the destination.

[00567][00566] The mobile navigation system may be part of a cellular telephone or any navigation device using a Bluetooth, part of the detection is a notification system is configured to wirelessly transmit the RF beacon ID of the proximity beacon and to associate the mobile ID of

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the user to determine the exact location of the user to provide for example: arrival notice to a representative of an airline. The arrival notice may be configured to cause the user to be checked into a flight of the airline.

~~[00568]~~[00567] The system may be configured to wirelessly transmit the arrival notice to a representative of a hotel. The arrival notice may be configured to cause the user to be checked into the hotel.

~~[00569]~~[00568] The system may be configured to wirelessly transmit the arrival notice to a representative of a food service.

~~[00570] The arrival notice may be configured to trigger payment for merchandise or a service.~~

~~[00571]~~[00569] The arrival notice may be configured to trigger the delivery of merchandise or a service to a vehicle in which the user is traveling. The arrival notice may include information about the location of the vehicle.

~~[00572]~~[00570] The arrival notice may be configured to trigger promotional items to be delivered to the user relating to an establishment at or near the destination.

~~[00573]~~[00571] The system may be configured to wirelessly transmit the arrival notice to a representative of a conference that has been scheduled to take place at the destination.

~~[00574]~~[00572] The system may be configured to wirelessly transmit the arrival notice to multiple recipients. The multiple recipients may include attendees of a conference that has been scheduled to take place at the destination.

~~[00575]~~[00573] The system may be configured to wirelessly transmit the arrival notice to a social networking site in a fashion that causes notice of the arrival of the user to be published by the social networking site.

~~[00576]~~[00574] The system may be configured to ask the user for permission to transmit the arrival notice.

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[00577][00575] The system may be configured to automatically transmit the arrival notice upon detection by the arrival detection system of the arrival of the mobile navigation system at the destination.

[00578][00576] At the time the navigation computer receives the destination to which the user wishes to travel, the system may be configured to ask the user whether the user wants the arrival notice to be transmitted in response to detection by the arrival detection system of the arrival of the mobile navigation system at the destination.

[00579][00577] The system may include a global user setting which a user may set to automatically transmit or not transmit arrival notices in response to detection by the arrival detection system of the arrival of the mobile navigation system at destinations.

[00580][00578] The system may be configured to ask the user to where it should transmit the arrival notice, to receive information indicative of this requested location from the user, and to transmit the arrival notice to this location.

[00581][00579] The system can create and utilize a network, which is referred to as dynamic deployment. The system will use the built-in Bluetooth protocol stack module that is able to simultaneously interconnect with other local devices, such as portable cellular phones in a "piconet", over the local area. The simultaneous connectivity limit of eight (8) devices at a time is overturned by the ability of creating a plurality of piconets which operate in a close proximity. It is understood that the Bluetooth enabled devices, such as portable cell phones, can rapidly move from one piconet to another. In fact, the Bluetooth devices need only remain a member of a piconet for the period of time required to complete one communication transaction. So the Bluetooth enabled devices can join and leave a local piconet frequently, effectively overcoming the eight (8) device limit. It is noted, even without the option to use a long range Bluetooth antenna, the configuration can effectively reach an unlimited distance.

[00582][00580] The proposed invention provides an ability to form a wireless as hoc Bluetooth network or networks based on a collection of Bluetooth mobile devices that dynamically form a temporary network as long as these device are within a sufficient range (inside a room or a building, road store or a mall). The flexibility of the ad hoc network is what

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makes it a suitable choice for emergency deployment scenarios, where multiple devices would be deploy in a proximity area that is designated as an emergency to provide a new way of distributing emergency and alert information directly to those in the needed area.

[~~00583~~][00581] Moreover, based upon normal human behavior, there is no need to inform everyone in a full room, or requiring all of the proximity devices participating in the network to be informed (for example in emergency). If only a few people within the occupied room are informed or receive the emergency information on their portable cell phone, they will convey the information to others located in the area..

[~~00584~~][00582] The same method and idea is mimicked by the concept of dynamic deployment. The concept can be paralleled as a new way to deliver critical emergency alarming and notification without infrastructure in the localized area.

[~~00585~~][00583] Moreover, the limitation of Bluetooth coverage can be overcome by utilizing the capabilities of the Bluetooth protocol in the methods described above. For example, in a very large conference location, the localized Bluetooth network (piconet) can join each other and form a larger network that covers the entire facility, which is much larger than the limited coverage of a single Bluetooth device. Portable cell phones located at one end of the facility can communicate with a second Bluetooth enabled device located at the opposite end, where the communication traffic is relayed by one or more intermediary, bridge devices. Any Bluetooth device, in our example Bluetooth enabled cellular phones, can become the bridge. The cellular phone owner does not need to know whether his/her device is a bridge, as the process is established and functions automatically as part of the Bluetooth protocol stack routine; in effect not changing any internal behavior of the Bluetooth.

[~~00586~~][00584] And again, there is no need to reach all the people with an emergency or other message, as if the message were conveyed to only a few in a room, at least a portion of those would inform the remaining people of the emergency message.

[~~00587~~][00585] Moreover, the present innovation will allow the user to use a "local instant emergency messaging system". The dynamic deployment configuration provides the ability for people to communicate with one another in the same local proximity using Bluetooth, where the

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people can chat and exchange important messaging for free exclusive of a need for a cellular network. Just think what it can be done in emergency or even in army deployment as other communication method.

[00588][00586] From the old days in history, humans used messengers to deliver news and information. The disclosed invention uses applies these older concepts to a device that will make it easy to distribute and broadcast the information around, using the messengers as the mobile (emergency) notification, as referred to as dynamic deployment.

[00589][00587] These, as well as other components, steps, features, objects, benefits, and advantages, will now become clear from a review of the following detailed description of illustrative embodiments, the accompanying drawings, and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[00590][00588] The preferred embodiments of the invention will hereinafter be described in conjunction with the appended drawings provided to illustrate and not to limit the invention, in which:

[00591][00589] FIG. 1 presents a schematic diagram representative of an infrastructure deploying a series of radio frequency(RF) wireless beacons;

[00592][00590] FIG. 2 presents a schematic diagram representative of an indoor mapping system utilizing RF wireless beacons, wherein the diagram depicts an exemplary application within a shopping mall environment;

[00593][00591] FIG. 3 presents a schematic diagram illustrating basic exemplary functions of an indoor mapping application as used on a mobile or cellular phone;

[00594][00592] FIG. 4 presents an exemplary flow diagram representative of an indoor detection and navigation process;

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~~[00595]~~[00593] FIG. 5 presents an exemplary series a gradient concentric circles indicative of a location;

~~[00596]~~[00594] FIG. 6 presents an exemplary flow diagram representative of a business based application utilizing a series of deployed RF beacons;

~~[00597]~~[00595] FIG. 7 presents an exemplary flow diagram representative of a marketing based application utilizing a series of deployed RF beacons, wherein the marketing based application utilizes a profile, preferences, and other information for sales and marketing purposes;

~~[00598]~~[00596] FIG. 8 presents an exemplary schematic diagram representative of a series of functions or applications associated with a series of deployed RF beacons, wherein the series of functions or applications are generally directed for use with an RF beacon infrastructure deployed within an indoor environment.

~~[00599]~~[00597] FIG. 9 presents an exemplary schematic diagram illustrating an infrastructure employing RF beacons deployed in the indoor environment;

~~[00600]~~[00598] FIG. 10 presents an exemplary schematic diagram representative of a series of functions or applications associated with transportation and/or telematics applications, wherein the series of functions or applications are generally directed for use with a static and/or dynamic RF beacon infrastructure;

~~[00601]~~[00599] FIG. 11 presents an exemplary schematic diagram representative of a series of functions or applications associated with hospitality based applications, wherein the series of functions or applications are generally directed for use with hospitality related businesses and environments;

~~[00602]~~[00600] FIG. 12 presents an exemplary flow diagram representative of a next generation marketing tools employing RF beacon technology; and

~~[00603]~~[00601] FIG. 13 presents a schematic diagram illustrating an exemplary dynamic deployment of an RF based network for use in a variety of applications, including mobile to mobile communications, car to car communications, and emergency or local communications.

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[00604][00602] Like reference numerals refer to like parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[00605][00603] In all the figures of the drawings, sub-features and integral parts that correspond to one another bear the same reference symbol.

[00606][00604] Referring now to the drawings in detail and first particularly to FIGS. 1-13 thereof.

[00607][00605] FIG. 1 presents an exemplary flowchart illustrating a use of RF beacons (102). The RF beacons can utilize at least one of Bluetooth and Wi-Fi signal protocols. The exemplary system utilizes a mobile cellular phone (101) to scan and detect a proximity of an installed beacon (102) in the most part for determining an indoor or outdoor location in a proximity to a known location of the installed beacon(102) and for initiating or triggering a notification of an existence to indoor and/or outdoor navigation and delivery of local content according to the determined location. The same method can be used by fix computers or portable computers (103), portable devices (104), pedestrians carrying a portable device (105)(such as a cellular phone), or a vehicle / car (106) that can be equipped with RF Bluetooth or Wi-Fi technology. It is noted that the static beacons (102) can be assisted by including other portable RF Bluetooth or Wi-Fi enabled devices within the network, thus creating a dynamic network. It is understood that a number of applications can be provided utilizing the infrastructure created by the series of deployed beacons. Additionally, the applications can utilize a precise location of the user, wherein the location is determined by information provided by beacons signals emitted from each of the deployed RF beacons (102).

[00608][00606] FIG. 2 presents an exemplary use of the RF Bluetooth and/or Wi-Fi beacon infrastructure deployed in a mall environment. An indoor map (200) of the mall interior is downloaded and saved or installed on the cellular phone (101). The indoor map (200) includes building structure layout, business locations and descriptions, and known RF beacon (102) locations throughout the associated mall, building, or other facility. The RF beacons (102) can be

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deployed inside stores or at as any other Points of Interest (POI) located throughout or around the mall. Information associated with an RF beacon (102) located proximate the cellular phone (101) can be forwarded to the cellular phone (101) by the beacon signal. The associated information (109) can be displayed upon the cellular phone (101) as illustrated. A location of the beacon signal receiving device (such as a cellular phone (101)), can be determined based upon a close proximity to one or more of the RF beacons (102) of the series of deployed beacons, which create the infrastructure. The precise location of the receiving device (101) can be determined based upon an identified beacon ID and a signal strength from the detect beacon (102) or beacons (102). The precise location can then be displayed upon an indoor map (200), as shown in FIG. 9.

[00609][00607] FIG. 3 presents an exemplary operational process completed by the cellular phone (101). The mobile device (101) activates an application program for indoor mapping of the facility, building, structure, and the like (200) and scans a local area for RF beacons (102) to determine the precise location (302) of the mobile phone (101). The location of the mobile phone (101) is determined done by scanning the infrastructure of RF beacons (102), wherein each beacon is installed in a known location within the structure, wherein the structure can be a mall, a building, any facility, or any other enclosed structure. The RF beacons (102) can be installed inside stores or at any specific Point of Information (POI), around the mall. The location of the cellular phone (101) can be determined by using information from any RF beacon (102) located in a close proximity to the cellular phone (101). The application would recognize the beacon ID embedded within a beacon signal emitted by the proximate beacon (102). The application would calculate the location of the cellular phone (101) by utilizing a signal strength of the emitted and received beacon signal. This process provides a solution for a user to determine their location exclusive of a global positioning system (GPS), access to the Internet, or any other bi-directional communication. The location of the cellular phone (101) is then displayed upon an indoor map (200) on a display on the cellular phone (101). Should the cellular phone (101) be located in a suitable area and comprise the ability to establish bi-directional communication, the cellular phone (101) can transmit a notification signal or message indicating that the cellular phone (101) is in a region proximate the RF beacon (102), such as by transmitting an "I am here" message to a predetermined recipient. This can provide an automatic check-in process, where the user "notifies" others of his local existence to the local area business

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to establish his local location. in turn, the system can forward local contents to the cellular phone (101), wherein the local contents would be information associated with the current position of the cellular device (101). The system can be enhanced to utilize a direction of travel of the cellular phone (101) and anticipate approaching beacons. The system would then determine and transmit information associated with RF beacons located along the current projected path of travel of the cellular phone (101).

[00610][00608] FIG. 4 presents an exemplary flowchart illustrating an indoor detection and navigation procedure. A user of the mobile cellular phone (101) approaches a facility/area where the user can download the facility/area map (200) having a series of RF Bluetooth and/or Wi-Fi beacons (102) installed in known locations throughout the facility/area. The application installed on the cellular phone (101) will scan the area/facility for broadcasted beacon signals. Upon receiving a broadcast beacon signal, the application will determine if the received beacon signal is associated with any beacons included in the list of known beacons (102). If the signal is determined to be associated with any beacons included in the list of known beacons (102), then the application proceeds with a location determination process (303). The location of the user (cellular phone (101)) is determined to be in a proximity of the identified beacon (102) transmitting the received beacon signal. The location is refined by using a signal strength of the beacon signal of the identified beacon (102) enabling determination of a more precise indoor location of the cellular phone (101). The location is then identified and displayed on an associated indoor map (200). In a condition where the cellular phone (101) fails to receive a beacon signal, the cellular phone (101) continues to scan the area (107). An optional feature includes a step of transmitting a notification of existence upon identification of a location; essentially having the cellular phone (101) transmit a message stating “I am here” (304) to the local area as a way of automatically check-in and/or a method of notifying a system that the user is within a local region. For example, the system can notify a local area business that a user is within the vicinity. In another example, the system can convey local contents to the cellular phone (101) based upon receipt of the notification that the user is within the area. The system can provide the user with a navigation heading (305) to waypoints based upon the current location of the cellular phone (101). In yet another example, the system can transmit Points Of Interest (POI) to the cellular phone (101) as illustrated in FIG. 2.

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[0061-1][00609] FIG. 4 is a flowchart illustrating of the indoor detection and navigation procedure according to an embodiment of the present invention. Referring to FIG. 4, the user with mobile cellular phone (101) approach a facility/area where he can download the facility/ area map (200) with RF wireless Bluetooth and or Wi-Fi beacons (102) installed in the facility area in a known place. The user mobile cellular phone (101) application will scan the area/facility for the known list of the beacons (102), if beacons was found then a location determination process (303) where is location of the user is determine as proximity to the find and match beacon ID, being in a close proximity to a beacon and recognize the beacon ID as well as calculating the Signal strength from the detect beacons (102) allow determination of the precise location indoor and ability to show the location over the indoor mapping (200), scanning is continue if no beacons (407) was found, when found the location is display on the loaded map over the mobile cellular phone(101) or Bluetooth device (103-106), part of the detection is to notify of existence "I am her" (304) to the local area as a way of automatic check-in method where the user "notify" his local existence to the local area business to establish his local location (303) and receive local contents, according to his location a heading navigation(305) between Points Of Interest (POI) can be establish.

[0062][00610] FIG. 5 presents an exemplary RF beacon accuracy radius circle (501) that is utilized in at least two distinct manners: one manner is used for the application, and a second manner is used to identify when the user's cellular phone (101) enters and/or exits the area around and in a proximity to a beacon (102) of the series of beacons (102). The central circle (502) and inner circle (503) illustrate different radii from the respective beacon presenting an accuracy of the location of the cellular phone (101). The radius circle (501) would be placed as an overlay circle over a portion of the local indoor map (200). This displayed configuration would identify an accurate location of the cellular phone (101) respective to the proximity of the beacon signal received from the Bluetooth and or Wi-Fi RF beacon (102) installed in the vicinity of the cellular phone (101).

[0063][00611] FIG. 6 presents an exemplary flow diagram of a business application utilizing the series of RF beacons (102) deployed throughout a facility, one or more buildings, a mall, a store, and the like. Each RF beacon (102) can be installed by the facility owner, a business owner (601), an advertising company, and the like. In one application, a business owner

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(601) would install an RF beacon(102) in their business. When the user of the cellular phone (101) approaches the RF beacon, the cellular phone (101) detects the beacon signal transmitted by beacon (102) in the proximity thereof. The cellular phone (101) receives the beacon signal and determines the identification of the beacon (102) associated with the received signal. Once the location and/or identity of beacon is known, the application initiates a procedure to obtain local content delivery (604) from the business and/or business owner. In one option, the system can provide business or local content (605) to the cellular phone (101). In a second option, the cellular phone (101) can transmit a signal that will directly or indirectly notify the business owner that the cellular phone (101) is located proximate a specific beacon (102), wherein the specific beacon (102) is associated with the business owner's store, located either proximate to or within the business owners store, and the like. In turn, the business owner can provide local content (605) to the cellular phone (101).

[00614][00612] FIG. 7 presents a flow diagram illustrating an exemplary target marketing feature. The application uses a profile preference provided by the user's cellular phone (101) wherein the mobile device scans the local area and determines the location of the cellular phone (101) using information obtain from a beacon signal broadcasted by an RF beacon (102) and optionally utilizing a beacon identifier (302). The profile preference is associated with the user of the cellular phone (101). The profile preference is provided to the local business in conjunction with a notification that the cellular phone (101) is located in the proximity to the specific RF beacon (702). The process can filter information to determine local based services contents (704), wherein the local based services content (704) is based upon the profile preferences of the Local Based Services (LBS), and the user's behavior (703). The system can determine local based services content (704) such as deals, offers, coupons and specials, and the like, as well as store or business information, and provide the information accordingly to the user through the user's cellular phone (101).

[00615][00613] FIG. 8 presents a series of Local Based Service (LBS) applications that can be utilized in conjunction with infrastructure provided by the series of deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. One application (Parking and Return to Parking (810)) provides a method for searching for available parking spaces and/or a process for assisting a user to return to the parking location of the user's

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car. The Parking and Return to Parking (810) application can provide parking information within a parking garage, in a mall parking area, for street parking, and the like, wherein the Parking and Return to Parking (810) provides the user with direct navigation to empty parking spots and/or to provide the user guidance to return to the location where the car was previously parked.

[~~00616~~][00614] In another application (Nav realty (802)), information associated with real estate is provided to a user using RF beacons (102) installed at each real estate property. Each RF beacon (102) would provide local information about the associated real estate property and can include navigation information respective to the local area real estate directly to the user's cellular phone (101).

[~~00617~~][00615] In yet another application Navmall/store (803), information can be provided to business operators and subsequently, business related information can be provided to the application user.

[~~00618~~][00616] In yet another application, Navsale marketing (804), sales, specials, coupons and the like can be transmitted to the cellular phone (101) and/or the system can provide directions / navigation to the user to guide the user to areas displaying items associated with the sales, specials, coupons and the like.

[~~00619~~][00617] In yet another application, Navmuseum, Navconference, Navshow 805, the RF beacons (102) would be installed in known locations within a museum, a conference center, and any other related location, whereby the RF beacons (102) directly or indirectly provide information and/or navigation associated with the location to the user of the application.

[~~00620~~][00618] In yet another application, Navamusement (819), the RF beacons (102) would be installed in known locations about any amusement park, theme park, or other entertainment venue, whereby the RF beacons (102) directly or indirectly provide information and/or navigation associated with the venue to the user of the application. The application can be enhanced by including an optional feature to assist a user in reducing wait times for access to rides, events, shows, and the like.

[~~00621~~][00619] In yet another application, Navemergency (818), the RF beacons (102) provide critical information and/or navigation to the user during an emergency event including

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instructions pertaining to an emergency procedure, an emergency evacuation map and directions for evacuating the facility to a safe location.

[~~00622~~][00620] In yet another application, Transportation (810), the RF beacons (102) would be deployed in a subway, on a train, on a bus, and/or in any mass transit system. This infrastructure would provide the user with information directly to their cellular phone (101) from the deployed RF beacons (102) installed along the route. This gives the user a complete navigation on a map of the train/subway mass transit directly to the user's cellular phone (101). In an alternative mode of the Transportation Application (810), the RF beacons (102) can be deployed along a side of a road, a cellular phone (101) residing within a vehicle, integrated into a vehicle, and the like. When the cellular phone (101) is mobile, the cellular phone (101) provides wireless vehicle-to-vehicle communication. One optional feature of this application would be an inclusion of automatic traffic notifications, what can be referred to as automatic "waze", whereby the cellular phone (101) can provide automatic traffic and road notifications. In an alternate embodiment, a Bluetooth device can be located within a vehicle (106) (as either a fixed or a portable device), on a driver (105), on a pedestrian, and the like. The cellular phone (101) can be included as an integral element in gathering traffic information.

[~~00623~~][00621] In yet another application, Navsign (811), the RF beacons (102) can be installed along a roadway at locations either proximate traffic signs or at locations exclusive of traffic signs, but would be appropriate for conveying traffic related information to a driver. Each RF beacon (102) would be installed at a location enabling passing vehicles to receive beacon signals from the deployed series of RF beacons (102). The related infrastructure would provide a telematics system to the driver's cellular phone (102), a system integrated into a vehicle, and the like.

[~~00624~~][00622] In yet another application, Indoor Navigation (808), the RF beacons (102) can be employed to provide an infrastructure enabling the application to determine a precise location of the receiving device. The application would additionally include a capability of providing navigation between various deployed RF beacons (102). This application provides a solution in areas where the global positioning system (GPS) is ineffective, such as indoors. The system also eliminates a need for bidirectional communication.

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[00625][00623] In yet another application, Nav Hotel, Resort, Cruise Ship (816), the RF beacons (102) can be deployed within a hospitality environment to provide an infrastructure enabling the application to determine a precise location of the receiving device within the hospitality environment or venue. Since most of the environments of the hospitality venues are located indoors, this application provides a solution in areas where the global positioning system (GPS) is ineffective.

[00626][00624] In yet another application, Notification/Automatic Check-In (815), the cellular phone (101) is directed to automatically transmit an arrival message, which notifies a recipient that the cellular phone (101) has received a beacon signal from an RF beacon (102) within the infrastructure of beacons and that the cellular phone (101) is in proximity of the RF beacon (102). The application can additionally consider elements of the user's profile when determining whether to send the arrival message and/or what is included in the arrival message.

[00627][00625] In yet another application, Payments (814), a payment transaction method can utilize a location determined by the proximity of the cellular phone (101) to an RF beacon (102) of the series of RF beacons (102). The location, the identification of the RF beacon (102) and/or the user profile can be associated with the payment.

[00628][00626] In yet another application, NAV Dating / Social Networking Link (812), a precise location of the cellular phone (101) is determined using information associated with the beacon signal. The location information is then utilized to assist the user in regards to social networking as well as indoor navigation.

[00629][00627] In yet another application, Dynamic Deployment / Local Communication (813), the application establishes an ad hoc network between a series of mobile Bluetooth based RF beacons, such as Bluetooth transceivers of cellular phones (101) to provide local messaging between a message transmitting user and a message receiving user, wherein the message is conveyed through at least one intermediary Bluetooth RF beacon.

[00630][00628] In yet another application, Nav Emergency (818) the RF beacons (102) provide navigation to the cellular phone (101) from the current location of the cellular phone (101) to an exit location using a predetermined optimal emergency exit route. The location and

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routing would be based upon the initial location, which is determined by a proximity to an RF beacon (102) of the localized RF beacon infrastructure. The application can additionally provide an emergency procedure and any other necessary notifications to the user through the user's cellular phone (101).

~~[00631]~~[00629] In yet another application, Scanning For Life (817), the cellular phone (101) converts into a beacon in a condition where two-direction communication networks are unavailable by either lack of installation or an outage. The beacon repetitiously transmits a beacon signal using at least one of cellular transmissions, Bluetooth transmissions, and Wi-Fi Transmissions. Search and rescue parties utilize a portable receiver to scan for and locate the Scanning for Life beacon signal. The beacon signal can optionally include embedded information associated with the cellular phone (101), which can include specific information associated with the user of the cellular phone (101).

~~[00632]~~[00630] It is noted that the RF beacon infrastructure enables execution of the above-described application exclusive of cellular communications and/or access to the Internet.

~~[00633]~~[00631] FIG. 9 presents an exemplary indoor infrastructure of RF beacons (102), wherein the RF beacons (102) are installed in known locations throughout a local area. Each RF beacon (102) broadcasts at least one of a Bluetooth signal and a Wi-Fi signal. The RF beacons (102) enable an application to determine a precise location of the cellular phone(101) on a local map (200). Once the application determines the location of the cellular phone (101) respective to a proximate RF beacon (102), the application can utilize a user profile or profile preferences to obtain marketing information. The user profile or profile preferences can be used to filter information provided to the cellular phone (101). The application can provide information to a remote recipient using Application Information (API (901) triggering or initiating content delivery (604). When triggering content delivery (604), a 3rd party application (903) would respond to the transmission directed by the application by conveying or pushing local content or other associated information to the cellular phone (902). The bi-directional communication can be accomplished using cellular communication, an ad hoc network, an Internet based communication, and the like. In another embodiment, the remote recipient can include a local

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business owner, thus notifying the business owner that the specific cellular phone (101) is in a vicinity of the business.

[00634][00632] FIG. 10 presents a series of transportation based applications that can be utilized in conjunction with infrastructure provided by the series of fixed or dynamically deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. A portion of the applications introduce telematics therewith.

[00635][00633] One application (Automatic Traffic Alert (1103)) provides beacon signals comprising telematics including traffic alerts.

[00636][00634] In a second application (Dynamic Deployment (1104)), an ad hoc network is created between vehicles providing vehicle to vehicle communication using an intermediary communication link. The vehicle to vehicle communication is preferably accomplished using a Bluetooth protocol.

[00637][00635] In another application (Find Parking and Return to Parking (1105)), the RF beacon infrastructure is used to inform a user of available parking locations and/or provide navigation guiding the user to the location where the user parked their vehicle.

[00638][00636] In yet another application (Automatic Traffic Alert (1103)), a driver (105) can employ their cellular phone (101) to deliver automatic traffic information (1103).

[00639][00637] In yet another application (Trigger Application (1102)), the system identifies an RF beacon, which subsequently triggers or initiates an application.

[00640][00638] In yet another application (Local Tracking (1106)), the system utilizes a Bluetooth beacon that can recognize the car/driver ID and subsequently track the car/driver.

[00641][00639] In yet another application (Access Control (1107)), recognition of either a proximate RF beacon or an approaching cellular phone (102) causes activation of a device. This can be accomplished using any of many suitable processes. For example, when a vehicle is approaching a gate, the vehicle would receive a beacon signal from a local beacon. The signal would be deciphered to determine the identity of the beacon. Once known, the system would act

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according a directive that is associated with the proximate beacon identity. In one example, the system would transmit a signal to open a gate when the vehicle approaches the gate.

[~~00642~~][00640] In yet another application (Theft Prevention (1109)), the RF beacon (102) would recognize the vehicle and prevent theft.

[~~00643~~][00641] In yet another application (Automatic Payment (1114)), the cellular phone (101), an RF beacon device integrated into a vehicle, and the like, broadcasts a beacon signal comprising a beacon identifier, wherein the beacon identifier is used in conjunction with an automatic payment method.

[~~00644~~][00642] In yet another application (Transportation Management (1110)), the RF beacons provide assistance for management of transportation systems.

[~~00645~~][00643] In yet another application (Accident Prevention (1111)), the RF beacons provide assistance for prevention of accidents, such as by notification to a user when two RF beacons become too close to one another.

[~~00646~~][00644] In yet another application (Saving Fuel (1114)), the application or series of applications can reduce fuel consumption by optimize navigation, reducing time finding parking spots, provide telematics associated with traffic, provide management support of transportation systems, and the like.

[~~00647~~][00645] In yet another application (GPS Add-On Navigation (1113)), the series of RF beacons (102) can be used to determine a location of a receiving device and can additionally be used to obtain navigation. This is particularly beneficial in areas where the global positioning system (GPS) is ineffective (such as indoors).

[~~00648~~][00646] In yet another application (Nav Sign (1112)), the RF beacons can convey information associated with road signs.

[~~00649~~][00647] FIG. 11 presents a series of navigation based applications that can be utilized in conjunction with infrastructure provided by the series of deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. Each RF beacon (102) contains and broadcasts a beacon signal comprising a beacon identifier to enable a

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receiving device to determine a precise location of the device within a facility, a mall, a show, a store, and the like. The RF beacons would broadcast a beacon signal using at least one of Bluetooth and Wi-Fi protocol. At least a portion of the RF beacons (102) can be associated with a Waypoint.

~~[00650]~~[00648] Each of the series of exemplary applications provides a location determining solution and navigation in an environment that is not conducive for the global positioning system (GPS), such as within a mall, a store, a parking garage, and any other indoor location.

~~[00651]~~[00649] One application (Parking and Return to Parking (1510)), the RF beacons (102) are deployed in a parking area. Each RF beacon (102) includes at least one sensor to determine a presence of a vehicle in the associated parking spot. The RF beacons (102) identify vacant parking spots and provide navigation to each vacant parking spot to a user. The application can additionally or alternatively provide navigation directing the user to the parking spot containing their vehicle.

~~[00652]~~[00650] In a second application (Stores Directory (1520)), a directory of merchants is provided to the cellular phone (101). The directory can include displaying locations of the merchants on a local map (200).

~~[00653]~~[00651] In another application (Search and Find (1111)), the RF beacon infrastructure is used to provide directions or navigation between known waypoints within an indoor facility, such as a mall. The known waypoints would be displayed upon the indoor map (200).

~~[00654]~~[00652] In yet another application (Sales, Deals, and Specials (1540)), the network provides information pertaining to sales, deals, specials, and the like to the receiving device. The sales, deals, specials, and the like can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102).

~~[00655]~~[00653] In yet another application (Entertainment (1530)), the network provides information pertaining to entertainment to the receiving device. The entertainment can be associated with a location of the receiving device, wherein the location would be determined by a

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proximity to an RF beacon (102). The application can additionally provide navigation to a location associated with the entertainment.

~~[00656]~~[00654] In yet another application (Information and Events (1590)), the network provides information pertaining to entertainment to the receiving device. The entertainment can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102). The application can additionally provide navigation to a location associated with the entertainment.

~~[00657]~~[00655] In yet another application (Dining (1580)), the network provides information pertaining to dining in the local area to the receiving device. The dining information can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102). The application can additionally provide navigation to a dining location.

~~[00658]~~[00656] In yet another application (Emergency (1560)), the network provides a notification of an emergency situation, emergency procedural information, and navigation from the current location, through the structure, and to a predetermined exit location. The information would be respective to the proximate RF beacon (102).

~~[00659]~~[00657] FIG. 12 presents an exemplary flow diagram illustrating a next generation of marketing tools utilizing the RF beacon (102) infrastructure deployed in a local area. The network obtains a user's profile or preferences (701) as well as a user's behavioral pattern (704) associated with the user's cellular phone (101). The information is conveyed to a business owner (702) for marketing purposes. The profile and/or preferences are filtered to determine applicable local based services (LBS) (703). The information can trigger or initiate an application (304), establish a link to an existing system and software, and the like to provide at least one of local content (503) and indoor navigation (108) to the cellular phone (101) or similar receiving device.

~~[00660]~~[00658] FIG. 13 presents an exemplary schematic diagram illustrating a method of utilizing dynamic deployment to create an ad hoc network. Exemplary applications include vehicle-to-vehicle communication, emergency communication, local communication, and the like. The method establishes communication between a series of Bluetooth devices located

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proximate one another. One exemplary implementation employs cellular phones (101), utilizing the Bluetooth transceivers integrated therewith. The dynamic network is created by placing proximally located Bluetooth devices into an ad hoc or mesh network. The network is based upon overlapping signal transmission radii. The network can include installed and/or mobile Bluetooth devices, exclusive of cellular or other higher powered and costly communication interfaces. The method can be utilized in transportation creating a road size networking of vehicles and/or drivers for telematics or traffic information, a push alert providing road information, and creating a vehicle-to-vehicle communication capability. In another option, the network can be utilized in an emergency situation, more specifically, when and where the cellular network are unavailable, interrupted, down, or fail. The ad hoc network creates a longer range communication capability utilizing local low power Bluetooth and/or Wi-Fi devices to convey information to local emergency responders or other parties. Another optional feature of the dynamic deployment enables creation of an ad hoc network within a structure, a mall, a store, a building, an office, an entertainment complex, and the like, exclusive of cellular communication. The ad hoc network provides capability for local messaging between users in a proximity area. The network can be utilized to deliver local content to the cellular phone (101) exclusive of any broader and higher powered communication networks, such as cellular, and the like. The network would be applicable between cellular phones (101) vehicles comprising the appropriate transceiver technology (106), within a facility/building/area, and the like.

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INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

RELATED APPLICATIONS

[0001] This application is:

a Divisional Application of U.S. Patent Application Ser. No. 14/285,209 filed on May 22, 2014,

which is a Divisional Application of U.S. Patent Application Ser. No. 12/930,735 filed on January 14, 2011,

which is a Divisional Application of U.S. Patent Application Ser. No. 11/396,843 filed on April 03, 2006 (now US Patent 7,899,583 on March 01, 2011),

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/670,097 filed on April 12, 2005 (now expired); and

a Divisional Application of pending U.S. Patent Application Ser. No. 13/135,421 filed on July 05, 2011,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/932,811 filed on March 07, 2011,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/587,042 filed on October 01, 2009,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/069,899 filed on February 13, 2008 (issued as US Patent 7,924,149 on April 12, 2011),

which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/472,706 filed on June 22, 2006,

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which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/429,864 filed on May 08, 2006,

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/678,947 filed on May 09, 2005 (now expired),

a Divisional Application of pending U.S. Patent Application Ser. No. 12/587,042 filed on October 01, 2009,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/429,864 filed on May 08, 2006,

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/678,947 filed on May 09, 2005 (now expired).

FIELD OF THE INVENTION

[0002] This invention is directed generally to the field of RF beacons. More specifically, the application of a series of deployed RF beacons creating an infrastructure for use in navigation, marketing, emergency situations, transportation, parking assistance, hospitality applications, and the like, wherein the information is displayed upon a map on a user's cellular phone or similar device.

BACKGROUND OF THE INVENTION

[0003] Introduction to location based services:

[0004] Location based services are rapidly expanding. Outdoor location technologies are mainly based on GPS technologies. GPS cannot perform properly indoors and is therefore inadequate. As a result, indoor location systems are appearing on the market.

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[0005] The need for a system arises from various market segments and applications. One example in the market is the GPS based systems that use integrated positioning and navigation systems based on GPS receivers as the primary positioning technology. Subsequent to the events of September 11th' the Federal government mandated that GPS capability be built in to all cellular phones. However, the fact that uninterrupted satellite reception is not possible in many locations is a major limitation of GPS based systems. Densely populated areas and radio-frequency-signal shadowed locations, such as urban centers (a.k.a. "urban canyons"), generally do not allow proper operation of GPS, yet it is in these locations that the need is greatest.

[0006] There is a clear need for a cost effective system that maintains performance indoors, in urban canyons and in city centers.

[0007] Another important consideration is that GPS itself is susceptible to jamming and other man-made interference.

[0008] Description of GPS System:

[0009] The Global Positioning System (GPS) is a satellite- based navigation and time transfer system developed by the U.S. Department of Defense. GPS serves marine, airborne and terrestrial users in the military as well as civilians. Specifically, GPS includes the Standard Positioning Service (SPS) that pro- vides civilian users with 100 meter accuracy as to the location or position of the user. For military users GPS provides the Precise Positioning Service that is accurate to within 20 meters. Both of these services are available worldwide with no requirement for any local equipment.

[0010] View of GPS limitations:

[0011] First limitation of GPS is that upon activation the GPS receiver scans for signals from the GPS satellites. A unit must locate and receive signals from at least four satellites to be able to determine its location. This process of locating the satellites, receiving the data and achieving a position fix can take several minutes. This delay is problematic for many GPS applications.

[0012] Second limitation of GPS is that the receiver needs a clear view of the sky to successfully receive signals from the satellites, again under unfriendly RF conditions such as

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inside buildings, or in "urban canyons" or in the shadows of high buildings, the GPS suffers from multi-path effects and therefore shows poor performance or none at all.

[0013] Third Limitation-limited accuracy: There is a problem of limited accuracy of the civilian GPS signal. While knowing your position to within 50 to 200 feet anywhere on the planet is a major technological feat, it is still not accurate enough, to locate and navigate to an a store in a mall or to empty parking space, where each space measures about 10 feet, and most indoor store/malls are located where the GPS cannot work effectively.

[0014] Existing navigation systems, such as the new mandatory GPS equipped cellular phones, are based on GPS and have the aforementioned limitations.

[0015] Another significant factor adding to the limitations of the GPS based systems is the important role of map production; normally a user requires a map to be as detailed and as up-to-date as possible. The existing maps used by the GPS based systems provide limited detail and are not able to reflect changes on a real time basis, more over there is no mapping for indoor facilities at all. The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[0016] <u>The Proposed Solutions:</u>

[0017] In general, the subject invention is based on applying machine-learning techniques to the task of inferring aspects of the user's status from a stream of input from Small RF tags/beacons are installed in local area indoor or outdoor or in places designated as Point Of Interest (POI), be it at a mall, department store, product inside a store, street or garage parking, inside or outside location, public or commercial, The tags/beacons can be RFID (long range type), or a Bluetooth with the option to long range Bluetooth, or a Wi-Fi or any RF type. The tags/beacon broadcast a unique ID by wireless that identifies the location by the unique ID, the address and type of facility/store/product. The tag/beacon broadcasts its information to be picked up by the mobile phone application, via the cellular phone or other Bluetooth device with application.

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[0018] The focus of the application for the indoor guide navigation and local based services, or navigation in crowded urban areas, where GPS based systems, due to lack of access to satellites or the GPS limitations detailed previously, cannot achieve the required results.

[0019] The disclosed applications focus on the task of interactively guiding the user to a desired indoor destination.

[0020] Examples of indoor applications:

[0021] The user may wish to locate an empty available parking space in his vicinity.

[0022] The user may wish to locate a specific store in a shopping mall, or a particular aisle in a department store, or a specific item on a shelf.

[0023] The user may wish to locate a specific conference room in a convention center, or a Point Of Interest (POI) in an amusement park or a Point Of Interest (POI) in a museum.

[0024] The user may be looking for a train location in a station, or stops in a subway or underground train system.

PRIOR ART

[0025] At present, however, no prior art device utilizes the capabilities to display a real-time representation of navigating directly from the sensors without a central system; and without using a GPS based system directly to the "user". Also most systems are designed for the old query type search where interface to Internet and or database to a central system is needed

[0026] The navigation system automatically detects a signal directly from the bacon, no communication needed not even cellular communication to do the determination of the location where is other systems must have bandwidth available, over which to send a request to a central system, or to a database, and then must wait for a response. This takes time!

[0027] Even if the other systems have bandwidth, they are still based on the existing search concept where the user submits a query, searches and waits for the response. This is impractical.

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The subject system provides the information automatically, without submitting any query, and the response is according to the user's location, wherein the user's location is determined by proximity to the beacon in the local area.

[0028] Again, most of the existing prior arts are based either on a GPS based system or the existing car navigator, that depends on a GPS too. And the existing mapping that these systems use has the same limitations described previously and is impractical.

[0029] The present invention bridges the gap between the GPS based navigation and provides a complete solution.

[0030] Patent U.S. Pat. No. 7,031,875 Ellenby et al. describe a pointing system for addressing objects, provide a system and method based on GPS and Internet/database communication, it is not exactly a navigation but an information based system that needs the GPS to locate the user location so indoor services is likely out of the questions and the need for communication as well with GPS limits its availability and accuracy.

[0031] The system, as provided by the present invention, determines the location using the beacon/tag ID, Proximity Detection (PD), and Received Signal Strength (RSSI), Time of Arrival (TOA)=and Angle of Arrival (AOA).

[0032] Proximity Detection (PD)

[0033] This method relies upon a dense grid of antennas, each having a well-known position. When a mobile device is detected by a single antenna, it is considered to be collocated with it. When more than one antenna detects the mobile, it is considered to be collocated with the one that receives the strongest signal.

[0034] This method is relatively simple to implement. It can be implemented over different types of physical media. In particular, IR and RFID are based on this method.

[0035] Triangulation

[0036] In case more than one beacon/tag signal a Triangulation takes PD a step further, in the sense that it is based on measuring the signal level measurements from each antenna (possibly by

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using a triangulation mechanism), with respect to each mobile device. Following that, mobile is located by using a triangulation algorithm.

[0037] Like the PD method, triangulation is relatively simple to implement.

[0038] Time of arrival (TOA)

[0039] Time of arrival (TOA)is based on triggering the mobile devices to respond, and measuring the time it takes for the response to fly back to the antenna. The elapsed time represents the distance between the two. By using distances from a few antennas, a mobile's position can be triangulated. TOA is considered to be the most accurate method, because multi-path effects can be filtered out. Yet, it is considerably more complex to implement, as it requires a modification to the hardware on the mobile side, as well as special modifications on the antenna side.

[0040] Angle of Arrival (AOA)

[0041] Angle of Arrival (AOA) is based on finding the direction of maximal signal intensity for each antenna-device pair. By finding the intersection of several such direction vectors, a mobile's position can be estimated AOA is considerably less accurate than TOA, due to limited angular resolution and the fact that indoors much of the signal is reflected. Also, AOA antennas are more complex, as they require multi-section, highly directional antennas, and multiple RF circuitries.

[0042] Bluetooth is a newer wireless local networking standard that operates in the 2.4 GHz ISM band. and the range is shorter (typically 10-15m, although there are tags with a range of over 300 feet). On the other hand, Bluetooth is a "lighter" standard, highly ubiquitous (embedded in most phones, PDAs, PC peripherals, etc.) and supports, in addition to IP, several other networking services. Notably, Bluetooth supports serial port emulation, voice, and various types of object exchange. Bluetooth tag/beacons are small, pocketsize transceivers.

[0043] Every Bluetooth device's tag/beacon has a unique ID. This ID can be used for locating the tag/beacon and providing location information of the mobile device in the proximity.

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[0044] The relevant location scenario of the present invention is that of searching for a certain tag. It is the most accurate and the faster response time and it is this method in indoor navigation and locating when and where each tag/beacon ID is a known address position-waypoint.

[0045] Why use Bluetooth for indoor location?

[0046] Bluetooth has some advantages in the context of indoor location. These include:

[0047] Bluetooth uses RF-in the 2.4 GHz ISM band, specifically. In this frequency range, radio waves penetrate obstacles, such as walls and human bodies, albeit with a substantial loss.

[0048] This has two implications:

[0049] Availability of a "high-there" application is always some signal received from the tags/beacons.

[0050] Tags/beacons can be placed relatively far apart (typical range is 10-15 meters, i.e. not necessarily of one in each way point).

[0051] Bluetooth is ubiquitous-Bluetooth chipsets are being implanted everywhere nowadays (phones, accessories, computing devices, etc), the tags/beacon can be implements anywhere, inside buildings roads inside cars transportation entities, inside home for home automation triggering, or in any kind of business triggering application or and link to exiting system .

[0052] The fact that a Bluetooth location system can locate any Bluetooth enabled device, makes it more cost-effective. This means that an increasing fraction of humans and mobile assets around would become locatable in a Bluetooth covered site, with no additional hardware cost (no tags/beacons attached). The only need is to pre-register these devices. Bluetooth is a low power technology-tags need recharge, approx. once a week (or longer, depends on the usage scenario). Non-tags (e.g. BT enabled phones) are being recharged anyway on a regular basis, so they do not need special recharges. If they are being used for location, the fraction added to their usual (no Bluetooth) power consumption is relatively small.

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[0053] Bluetooth is a low cost technology, having expected high production volumes (hundreds of millions annually) lead to sub-$5 per chip. It is noted that several IC manufacturers have already met this goal. This would eventually result in a low price for the Bluetooth tags/beacons, if and when Bluetooth location systems would become sufficiently ubiquitous. Bluetooth is a multi-functional communication standard - location is only one of the services that can be supported by a Bluetooth infrastructure. The same infrastructure can be used to provide additional network services, particularly remote monitoring and control or just trigger link to exiting system. In addition, Bluetooth provides voice and IP services (although for the later, WLAN is typically more suitable).

[0054] In open spaces, relatively free of obstructions and walls (e.g. a large warehouse or a public hotspot), Bluetooth alone would suffice to provide a -2 meter error range.

[0055] Conclusions

[0056] The proposed beacon technology offers unique advantages: one is the ability to locate ubiquitous "any tags" (any Bluetooth enabled device can be associate and be use the advantage of the Bluetooth beacons, e.g. most of the newer mobile phones). The other advantage is the multiservice nature of the Bluetooth beacons infrastructure that enables using the tags/beacons for other purposes, such as for locating and navigating, remote monitoring and control, trigger existence and link to existing systems and software and for a variety of local based services and local push messaging services.

SUMMARY OF THE INVENTION

[0057] In accordance with the present invention, these are the navigation project's characteristics:

[0058] The proposed system is a locating and navigation method based on the following unique characteristics:

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[0059] In an indoor or outdoor navigation situation the RF beacons tags, replace the satellite in a GPS based system, to provide the user with the information and directions needed to reach the destination.

[0060] The proposed system has three major parts:

[0061] The detection and navigator, the special method used to display the data and the information from the area trigger as result of being in close proximity to the RF beacons in the area.

[0062] It is not a location and tracking system as offered by other systems.

[0063] Small RF tags/beacons are installed in each place designated as Point Of Interest (POI), be it at a mall, department store, product inside a store, street or garage parking, inside or outside location, public or commercial. The tags/beacons can be RFID (long range type), or a Bluetooth with the option to long range Bluetooth, or a Wi-Fi or any RF type. The tags/beacon broadcast a unique ID by wireless that identifies the location by the unique ID, the address and type of facility/store/product . The tag/beacon broadcasts its information to be picked up by the mobile phone application navigator, via the cellular phone or other Bluetooth device with application, the beacon ID trigger application and push information to the Bluetooth device or the cellular phone with the Bluetooth.

[0064] The system can serve as add on to the mall's/store's guide/mapping to provide extra assistance to user.

[0065] The navigator.

[0066] The navigator, cellular phone application Bluetooth application

[0067] The user device scan the local area for ID broadcast by the tags/beacons in the vicinity via the wireless Bluetooth interface with a cellular telephone utilizing the cellular phone's Bluetooth capability. It is important to note that no cellular communication or Internet or database access is needed to determine the location of the device and that any Bluetooth enabled device will operate the navigation application as a stand-alone device. The beacon system can interface with existing in car system and/or car navigation system.

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[0068] The display method.

[0069] The display method is a unique way to bridge existing devices like cellular phones, in-car system and in-car navigation and other Bluetooth devices. The system provides an overlay display method over the existing navigation system mapping or floor map or floor images, as a real-time floating display, or as a waypoint to overcome the limitations of GPS based systems and the existing mapping systems, the indicator placed overlay on the floor plan image, it may further include providing a visual indication a circle on the floor plan image of the path, wherein the visual indication – the circle indicates an area of the indoor map where the location information identifies a particular location and the circle provides the accuracy radius circle.

[0070] The mapping: a system and method for mapping an indoor environment is provided. a user device may receive an indication of a starting point on a floor plan.

[0071] The user device may prompt the user to travel in a particular direction, or the direction of travel may be determined by the user device in response to the user indicating a second location after the user has traveled to the second location.

[0072] As the user travels from the starting point in the designated direction, the user device may gather information about the indoor environment. For example, the user device may gather wireless signal strength data, from proximity RF beacons Wi-Fi or Bluetooth while the user travels in the designated direction.

[0073] The user device may associate the gathered information with the path the user traveled from the starting point to the ending point. The operation can be done at the user device – the cellular handheld, the association may also be performed by a remote server using data provided by the user device. As the user travels from point to point, the client device may indicate the area for which valid location information is available based on the path the user traveled and the information the user collected.

[0074] The Mapping can be offered as an additional service for the indoor based on area building floor or image mapping.

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[0075] The navigation system will enable remote planning based on downloaded local floor-plans the floor mapping or floor images – the indoor view images of the local building facility, or local navigation, when the location's floor plan can be triggered to down- loaded at the destination. An example of this would be at the entrance of a shopping mall, a department store, an amusement park, a museum, a parking garage, a downtown area of a city, and the like.

[0076] The navigation system is based on a network of tags/beacons that can be deployed anywhere. The system is accurate to within 10 feet, significantly better existing navigation systems and GPS. The system can work inside a building whereas GPS cannot.

[0077] Local detection is obtained via popular Bluetooth interface.

[0078] The system provides information about each facility/store, including information about the type of the facility, for example: type of store or product etc.

[0079] By providing the ability to locate a the user in an area using a Bluetooth enabled device, or a cellular phone with the navigation application and the RF beacons method, the system overcomes the anxiety of "Where am I "and also facilitates finding a parked car later via the RTP (Return to Parking) feature.

[0080] The system has the capability to perform all the functions of a search for and can become the "Next generation search out of the box".

[0081] The navigation system can be attractive for places that already deploy WI-FI and can be used for the existing WI-FI devices as a tags/beacons.

[0082] In case of an emergency or security situation, the system can provide authorities with information.

[0083] The system eases and facilitates navigation to indoor locations, without a navigation map or GPS. Indoor Mapping can be provided as part of the navigation system. The system provides "local" navigation as well as "remote" detection.

[0084] The system allows easy interface or trigger application with existing networks or existing system.

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[0085] The system saves gas, time, money and eases global warming by reducing the time spent searching for destination.

[0086] The navigation method is unique. The navigation system is based upon RF tags/beacons with interface to Bluetooth enabled devices. This feature allows detection and navigation in locations where GPS cannot work, as well as outside, with the ability to guide the user to within 10 feet of the destination, significantly better than any other navigation and GPS based systems on the market.

[0087] The Bluetooth RF tags/beacons are based on a long-range version of the popular short distance communication. This unique feature affords the user the ability to plan ahead from a remote location, by obtaining ID about the destination directly from the tags/beacons and by accessing the indoor floor plan to be navigated at the destination.

[0088] A major problem with In-Car navigation and GPS mapping is that they cannot guide the user closer than 50 to 200 feet, and only in open places. The navigation system can provide accurate directions to within 10 feet.

[0089] The navigation system will be a challenge to navigation providers and GPS providers as they cannot provide mapping or navigation inside a mall, department store, a parking garage or lot, and anywhere the GPS /Navigation map cannot accurately help navigate.

[0090] Utilizing this innovation, the facilities in the vicinity around the "user" car are displayed on a floating overlay using either a cellular phone application, or a stand-alone device, or an existing installed navigation system with or without any mapping.

[0091] The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[0092] Navigation using the mapping or floor plan of a location can be offered as a part of the system. The option of downloading a floor plan can be exercised either remotely or locally.

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[0093] The tags/beacons broadcast their signal continuously and any of the navigation devices will detect them and display the ID/data on the user's device in an easy to understand method.

[0094] With our innovation you have the information that you want, when you want it, where you want it ...(and at an affordable price)

[0095] Once you are in the vicinity of your destination and you switch on your navigation device, by being in proximity to installed beacons in the area you will automatically receive the facility information along your waking route and in all directions around you.

[0096] No further action is required, there is no need to send a request or to access the Internet/web or log on and search a database or central system the access to the Internet is to provide a local based services like push information or messages or offers, deals, advertising to the mobile user .

[0097] Other systems are still based on the existing search concept where the user submits a query, searches and awaits for the response. All impractical while the user needs the information immediately. The navigation system provides the information automatically, without submitting any query, and the response takes into account the user's location determined by the proximity RF beacons.

[0098] The unique approach to detection of the mobile inside the buildings does not need an Internet bandwidth or cellular communication. The Internet or cellular communication provides local based services and additional information that can be pushed to the user device.

[0099] And as a result there is no delay or waiting for communication and access time, the communication is instantaneous, triggered directly between the tags/beacons ID and the user's device.

[00100] Additionally, each facility type can be ID coded to identify the type of the store etc., e.g. restaurants, men's wear, women's wear etc.

[00101] Each ID-coded display of facility can be trigger accessed to information about the store e.g., providing automatic waypoint information.

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[00102] The ability to operate the innovation using the disclosed applications on a cellular phone, the navigator, with no need for cellular connection to determine the current location, means the user does not need any GPS system.

[00103] Moreover, the navigation system can solve the "RTP" (Return to parking) problem, where many forget where they parked their car. The system has an option to save the location on the "cellular phone-parking detector" application that will make it easy to locate the parked car.

[00104] The navigation solution is designed for global use and is not limited to malls, stores, amusement parks, museums, sports stadiums etc. It can be implemented in parking garages or parking spaces metered or not, the tags/beacons can be implemented anywhere and in any place to trigger and initiate existing and local application and even link to exiting system and existing software.

[00105] It is envisioned that in the future all new construction will have the tags/beacons included in the design, even place addresses, a building addresses can be replaced or use an add-on with the implementation of a tags/beacon in the area to be recognized or scanned by the mobile device.

[00106] The system integrates the navigation as part of the NAV4 concepts where it will provide complete solutions for local navigation in an area where the GPS can't work.

[00107] The navigation system consists of the following parts:

[00108] An infrastructure of tags/beacons, wherein each tag/beacon is installed in a local and known location.

[00109] The navigation system is based on mapping and navigation to and in the location, and its aim is to replace or supplement the mall/store guide/map, by installing the tags/beacons in each store or Point Of Interest (POI).

[00110] The mapping: As GPS and GPS mapping is not available indoors, the navigation system is based upon the floor plan mapping or floor images available from each facility. For planning ahead, the floor plan or the floor images can be downloaded as part of user's

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navigation/cellular phone remotely-via Internet as mobile application before reaching the destination or triggered when the destination is reached.

[00111] The Navigation uses the most commonly used device in the world today, the cellular phone with Bluetooth interface.

[00112] As a difference from other systems and other local based systems, this solution offers a unique approach that can be described as the "Search out of the box" as neither query nor database search is needed; all needed is to know the proximity tags/beacons ID and the cellular phone, working as a Bluetooth device, that automatically scans and recognizes the local area tags/beacons and determines the "user's" location, and provides instant information to the user and to the business in the area.

[00113] A typical application is guide and navigating a pedestrian in an environment like a mall, department store, specialty store, conference, trade show, amusement park, university, hospital, school, municipal building, museum, subway, train station, airport, down town center, a finance facility, cruise ship and any type of parking facility ...or any place when and where GPS cannot be provided or is not accurate or precise enough. The system will be used for navigation by first responders to emergencies or disasters.

[00114] The navigation system is part of the broad suite of applications that include a complete solution to the "user" from the time that he parks, or begins looking for a space to park his car, walking to the store/mall or to any indoor facility to when he wants to return to his parked car, looking for the place that he parked.

[00115] The suite may includes:

[00116] Parking detector-and navigation to the empty available parking space.

[00117] Automatic notification of user existence in the place/store/facility

[00118] Nav4 mall/store navigation solution inside mall/store.

[00119] RTP-return to parking-locate the place that you parked your car.

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[00120] For example, a typical application could be:

[00121] A pedestrian asks the way in a mall to a specific store.

[00122] A pedestrian asks the way inside the store, to a specific aisle or product.

[00123] A shopper in a department store asks for a specific department.

[00124] A pedestrian asks the way to a Point Of Interest (POI). In an emergency, the first response team has to navigate inside a smoke filled building.

[00125] A store owner can use the notification and the knowledge of existence for loyalty and rewards

[00126] The beacons ID can trigger a link to exiting software and aware the local system of the user existence – such as:

A traveler is check in into a hotel/resort, the hotel/resort can provides with automatic check-in and interface to the hotel/resort front system.

A traveler is check-in into a flight in the airport, the airline provides the traveler with automatic check in to the flight when the traveler reach close proximity to a RF local beacon.

A customer are check into a restaurant or food service, the business will recognize the customer when he in proximity to the local RF beacon.

The pedestrian reach an advertising area or billboard that can recognize the user by being in a close proximity to the advertising area and provide the user with customize personalize advertising or offer.

A customer is entering a store/bank/facility front would be identified/recognized for additional information or services.

The RF beacons/tags can serve to track employee time, including check-in and checkout times from designate area.

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The local RF beacons associate with the user mobile can be part of local dating system.

The local RF beacons with associate with the user mobile can create virtual secure zone for child or elderly or any care monitoring.

The location of the user as associate with the local beacons can be interface with social networking .

The RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking.

The RF beacon can be installed or be a part of a vehicle to provide car application like payments security car broadcasting car tracking car communication and automatic car counting to provide transportation managements with statistically information automatically.

[00127] A system and method to provide a user information which is related to the Point Of Interest (POI), the navigation system provides detection and navigation reference, position determination and information related to the object-Point Of Interest (POI), directly and automatically to the user interface-cellular phone upon arriving to a close proximity to the RF tags/beacons installed in the area.

[00128] Special operation mode: Shopping: provides navigation to the special sale item in a department store.

[00129] Special operating mode: Museums: provides navigation and interactive information from the museum's exhibition to the "user's" cellular phone device via Bluetooth interface.

[00130] Special operating mode: Parking: describe in 2 patent applications, provide empty parking space detection and navigation.

[00131] Special operating mode: Nav store provides navigation inside a store/department store to a specific department/aisle or specific product, with an option for advertising method and special promotion it also provides the business owner with ability to know, in a way of automatic

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notification when the "user" cellular phone device is in proximity to the local area for automatic delivery of information related to the store/business owner such information can be but is not limited to deals, coupons, special and even statistically information about the "user" habit.

[00132] Every Bluetooth device's tag/beacon has a unique ID. This ID can be used for locating the tag/beacon and providing location information of the mobile device in the proximity.

[00133] A relevant location scenario is that of searching for a certain tag. The relevant location scenario is the most accurate and the faster response time and is one solution for indoor navigation and locating when and where each tag/beacon ID is a known address position-waypoint.

[00134] Why use Bluetooth for indoor location?

[00135] Bluetooth has some advantages in the context of indoor location. These include:

[00136] Bluetooth uses RF-in the 2.4 GHz ISM band, specifically. In this frequency range, radio waves penetrate obstacles, such as walls and human bodies, albeit with a substantial loss.

[00137] This has two implications:

[00138] Availability of a "high-there" application based upon receipt of a signal from the tags/beacons.

[00139] Tags/beacons can be placed relatively far apart (typical range is 10-15 meters, i.e. not necessarily of one in each way point).

[00140] Bluetooth is ubiquitous-Bluetooth chipsets are being implanted everywhere nowadays (phones, accessories, computing devices, etc), the tags/beacon can be implements anywhere, inside buildings roads inside cars transportation entities, inside home for home automation triggering, or in any kind of business triggering application or and link to exiting system.

[00141] The fact that a Bluetooth location system can locate any Bluetooth enabled device, makes it more cost-effective. This means that an increasing fraction of humans and mobile assets around would become locatable in a Bluetooth covered site, with no additional hardware cost (no

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tags/beacons attached). The only need is to pre-register these devices. Bluetooth is a low power technology-tags need recharge, approx. once a week (or longer, depends on the usage scenario). Non-tags (e.g. BT enabled phones) are being recharged anyway on a regular basis, so they do not need special recharges. If they are being used for location, the fraction added to their usual (no Bluetooth) power consumption is relatively small.

[00142] Bluetooth is a low cost technology anticipating high production volumes (hundreds of millions annually) leading to sub-$5 per chip. Several IC manufactured have already met this goal. This would eventually result in a low price for the Bluetooth tags/beacons, if and when Bluetooth location systems would become sufficiently ubiquitous. Bluetooth is a multi-functional communication standard - location is only one of the services that can be supported by a Bluetooth infrastructure. The same infrastructure can be used to provide additional network services, particularly remote monitoring and control or just trigger link to exiting system. In addition, Bluetooth provides voice and IP services (although for the later, WLAN is typically more suitable).

[00143] In open spaces, relatively free of obstructions and walls (e.g. a large warehouse or a public hotspot), Bluetooth alone would suffice to provide a -2 meter error range.

[00144] Waypoint Navigation

[00145] A waypoint is a fixed location with known address location, longitude and latitude and coordinates. The navigation system is capable of storing a database of waypoints for the following purpose:

[00146] Waypoints mark a destination, a point along the way to a destination, or a point of reference. Normally, in navigating, a "route" consists of one or more waypoints. To traverse a route, the user navigates to the nearest waypoint, then to the next one in turn until the destination is reached. The system has the ability to compute a great-circle route towards a waypoint, enabling them to find the shortest route even over long distances. The system enables users to locate a destination on a map or indoor floor plan or indoor image and define it as a waypoint. The system is intended for navigation; it can generate a suggested route between two waypoints,

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based on the cartographic database. The system indicates the user's current location and gives advance notice of an upcoming point.

[00147] Because the system knows the waypoint positions, and the distance between them, it is easy to determine the "user's" exact location.

[00148] Map Matching

[00149] The navigation solution is further enhanced, although it is not essential, when the system knows that the person or object being located is traveling along known routes on a map; for example, the system can assume that people can only follow certain routes in a mall. This is priority information that can be used to "force" the estimated position to be on the nearest point on the possible routes, note that it is easier to predict indoor than outdoor.

[00150] The constraints of indoor construction similarly can be used to refine estimates of the position of a person or object moving within a building-people and objects do not pass through walls, they pass along corridors and through doorways. It is a best solution for a system in case of an emergency or for a system for homeland security or a system to locate and inform the subway location, a good example is the hotel exit floor map.

[00151] Configuration and Use

[00152] In the indoor application, instead of GPS, the system uses known waypoint positions that are manually detected and identified as a demonstration of the concept of using another sensing method, such as RF tags/beacon, to detect and identify the location and the waypoints. Theoretically, it would be possible to convert the waypoint positions into GPS coordinates and emulate an external GPS data source.

[00153] This system can be useful for providing navigation to first responder personnel indoors waypoints have been installed in a particular building in the form of RF tags/beacons whose identities are associated with locations- the meaning of identifier, it may be possible to associate magnetic anomaly information with individual tags as well.

[00154] One of the important features of the indoor navigation techniques will enhance the ability of tactical team's first response team to navigate within the buildings in which it has been

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deployed. RF (Bluetooth) Tag/bacon devices commonly are attached to persons or to moveable objects, so that the objects can be tracked using fixed readers (special- purpose radios) at different locations. This is the most common indoor navigation that exists today.

[00155] The navigation method is the "flip side" of this practice and is based on the concept that the detection of an RF (Bluetooth) device, or RF Tags/beacon, in a known, fixed location, by a moving reader, such as a Bluetooth enabled cellular phone or other Bluetooth enabled device, provides a precise location of a person or a moving object, by the carrier of the telephone or device, who can supply indoor navigation without GPS.

[00156] The navigation method provides a low-cost, reliable system for firefighters and other first responders, inside buildings, to navigate, where a GPS is not reliable-indeed, the GPS signal may have been disabled temporarily to prevent-exploitation by terrorists, or even more likely no signal can be received at all inside a building.

[00157] The navigation system foresees this limitation of GPS based systems, and is intended for an environment that is potentially much less "friendly" to RF signals, the environment inside a building that first responders encounter may contain smoke, dust, or flames, and is intended to leverage advances in RF/Bluetooth tag/beacon technology. The navigation system will exploit the capability of storing critical building information, such as the floor maps and the emergency escape plans, for retrieval and navigational assistance via a Bluetooth enabled cellular phone, when and where it is needed,

[00158] Moreover the navigation system can serve as a navigator for the emergency exit route when and where needed. Each user can load the emergency exit floor plan and escape with the knowledge of his exact location in that route.

[00159] Aspects of the scenarios to be included:

[00160] Identifies and tracks the user (a first response team member)option to use the cellular phone as a beacon by himself.

[00161] Provides the user with navigation information and directions for safely exiting the building.

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[00162] Provides location information of all team members, via an ad hoc network of radio terminals that combine RF/Bluetooth and allow communication chat and messaging between the team members without need for Internet or cell communication such option is not limit to the first response team but to a user in emergency and non-emergency use.

[00163] From the outset, the navigation system was designed with the capability to utilize existing technology so it can be deployed as a stand-alone system, or in tandem a link with existing systems. The system focuses on employing technology that is already in place that simply needs to be expanded.

[00164] With the implementation of the navigation system, a FIRST RESPONSE TEAM will be empowered to navigate and find its way in a case of emergency or a disaster. This capability can be a critical life-saving power in modem congested urban living conditions, not available before now.

[00165] It is believed that the implementation of the navigation system will assist counter-terrorism activities and more importantly will help the first response teams to save the lives of people trapped inside buildings.

[00166] Conclusion

[00167] The Bluetooth technology offers few unique advantages: one is the ability to scan and locate a small tag/beacon installed in an local area using the tags/beacon ID a low cost and battery power and low battery use and the use of the newest Bluetooth devices (any Bluetooth enabled device that is not a tag/beacon, e.g. most of the newer mobile phones) can be used as a tag/beacon.

[00168] The other advantage is the multiservice nature of the Bluetooth infrastructure that enables using the tags/beacons for other purposes, such as for navigating, remote monitoring and control, a triggering mechanism to application and system even a link to existing systems and for a variety of messaging a push information and local based services.

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[00169] Location based services are rapidly expanding. Outdoor location technologies are mainly based on GPS technologies. GPS cannot perform properly indoors, and is therefore inadequate. As a result, indoor location systems are appearing on the market.

[00170] The need for a system arises from various market segments and applications. One example in the market is the GPS based systems that use integrated positioning and navigation systems based on GPS receivers as the primary positioning technology. Subsequent to the events of September 11th' the Federal government mandated that GPS capability be built in to all cellular phones.

[00171] However, the fact that uninterrupted satellite reception is not possible in many locations is a major limitation of GPS based systems. Densely populated areas and radio-frequency-signal shadowed locations, such as urban centers (a.k.a. "urban canyons"), generally do not allow proper operation of GPS, yet it is in these locations that the need is greatest.

[00172] There is a clear need for a cost effective system that maintains performance indoors, in urban canyons and in city centers.

[00173] The disclosed application includes finding a solution to this task by providing a system and method to generate automatically the waypoint along the user route ether indoor, or outdoor.

[00174] The disclosed application addresses the task of interactively guiding the user to a desired indoor and outdoor destination.

[00175] The method for mapping an indoor environment is provided. A user device may receive an indication of a starting point on a floor plan. The user device may prompt the user to travel in a particular direction, or the direction of travel may be determined by the user device in response to the user indicating a second location after the user has traveled to the second location.

[00176] As the user travels from the starting point in the designated direction, the user device may gather information about the indoor environment. For example, the user device may gather

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wireless signal strength data, from proximity RF beacons Wi-Fi or Bluetooth while the user travels in the designated direction.

[00177] The user device may associate the gathered information with the path the user traveled from the starting point to the ending point. The operation can be done at the user device – the cellular handheld, the association may also be performed by a remote server using data provided by the user device.

[00178] As the user travels from point to point, the user's device may indicate the area for which valid location information is available based on the path the user traveled and the information the user collected.

[00179] The method may include displaying a floor plan image or floor mapping or the floor indoor view – the floor images corresponding to an indoor location, receiving a first input to indicate a first location on the floor plan image, gathering initial location information at the first location, and generating an indoor map, using a processor, using the initial location information wherein the indoor map includes an association of the initial location information with the first location.

[00180] The method may further include repeating the location information gathering process at a new location to associate new location information with the new location in the indoor map.

[00181] The method may include gathering additional location information as the user travels from the first location to a second location, receiving a second input to indicate the second location on the floor plan image, determining a path from the first location to the second location, and associating the additional location information with at least one location within the map corresponding to the path.

[00182] The method may include prompting the user to walk in a straight line when traveling from the first location to the second location.

[00183] The method may include providing instructions to a user to travel in a particular direction. The location information may be wireless signal data associated with one or more RF

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wireless beacons installed in the local area. The first input may include performing a selection operation with an indicator placed on the floor plan image.

[00184] The method may also include providing a visual indication on the floor plan image of the path. The visual indication may indicate an area of the indoor map where the location information identifies a particular location. The building floor plan may be received from a remote via Internet or cellular communication as part of the mapping and navigation application.

[00185] The method may also include determining an approximate location determine by proximity to the RF beacons, providing the approximate location to the remote server, receiving a list of floor plans associated with indoor environments proximate to the approximate location, and selecting the building floor plan from the list.. The method may include identifying the user's direction of travel by at least one of determining a relative orientation using the first location and the second location, or using at least one of an user device built-in sensors, accelerometer, a gyroscope, or a compass.

[00186] The method may include determining a location precision for the data gathering operation, and using the location precision to determine a location resolution for the indoor map. The location precision may be determined using a number of available RF wireless beacons for which signal strength data and the beacons ID are available. The location precision may determine at least one of the size of an indicator for indicating the current location or the accuracy radius circle, or the width of a stripe for indicating an area of the indoor map for which the location information has been gathered and will display overly on the floor map image map building map. The method may include determining a coverage level of the indoor map compared to the floor plan images.

[00187] The navigation system and method automatically updates waypoints, when each Point Of Interest (POI) will have an RF tag/beacon that will broadcast an RF ID signal that will provide an instant detection, the navigation system will execute the specified file/program that will trigger automatically, executing a waypoint generation program.

[00188] For some years, local governments in cooperation with various FM radio stations and recently a navigation system have been putting together an automated way to get real-time traffic

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data into cars so drivers can avoid traffic. Real time traffic information includes news such as: congestion, construction, traffic accidents, recommended alternative routes, recent navigation systems depend on fix sensors or camera and some navigation on manual information provided by the users/drivers.

[00189] A tag/beacon will be installed at the location or at each Point Of Interest (POI). The tag/sensor will broadcast RF signal contain ID to be recognized by the mobile phone and such information (the RF beacon ID) will transfer automatically via the user mobile phone to the provided location detection of the user as well as statistically information about the possible "traffic" in the area/road, such method can be extremely helpful to manage and control transportation system.

[00190] The "user" will no longer need to enter his way- points manually and then wait for the providers of maps or GPS to update their maps with the information (this can take about a year in some cases). This way the "user" will receive the information that he needs when he needs it and where he needs it upon entering an area with tags/beacons, providing an automatic "check-in" to the user and the facility business.

[00191] Again, no communication is need to be established between the tags/ beacon and the user mobile device and the detection can be done without any communication at all, In the event that more information is required it may be necessary to connect to the Internet website.

[00192] It is believed that sooner or later it will be a standard procedure to install a tag/sensor on every location of interest (waypoint) or any place on road indoor and even outdoor or any business will provide waypoint information to the "users". Most stores or POI/waypoints will be willing to pay for a tag/beacon or pay subscription fee to be on the mapping system on the local area that will show their location and information on a map. Or they will pay for an annual listing (similar to the yellow pages).

[00193] The System can interface with existing GPS mapping outdoors as well as indoors, it can switch automatically where the user outdoor to receive an outdoor map and information based on GPS and when in the indoor to receive an indoor mapping and indoor navigation based on RF beacons detections.

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[00194] Presently GPS providers, map providers and search engines provide: City Navigator and Metro Guide Maps that contain many thousands of attractions.

[00195] These include: Food and Lodging, Attractions, Entertainment, Shopping, Services, Transportation, Emergency, and Government offices. In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be very old and the information associated with them is not update. Listed Attractions include theme parks, museums, libraries, schools, parks and such. This feature is very useful in an unfamiliar area.

[00196] Waypoints will be located automatically in the local area and plotted on the map screen. The waypoints can be stored on the local map at the handheld phone for future access.

[00197] The navigation system will revolutionize the GPS based systems and the mapping industry, from GPS, mapping companies' communication providers, car manufacturers to yellow pages and local guides; for the first time the user of a GPS navigation system will have an easy, reliable way to reach a destination inside buildings facilities – the indoor world.

[00198] The most common problem with today's GPS based systems is indoors where the navigation and mapping is not existing. The navigation system provides the solution for this problem. Using the navigation system, the user will know where he is, be able to identify "landmarks" around him accurately, and receive automatic updates directly from the Points Of Interest (POI) in the vicinity that get automatic notifications about his presence in their area.

[00199] The navigation system is based on RF tag/beacons, each tag or waypoints has its own ID (identifying the waypoint by type, address, etc.). The beacon will broadcast, via RF the ID to be scan and pickup by the Bluetooth device, provides a detection and trigger a location determination as a floating information display on the indoor map referenced to the user's location. The floating display will provide automatic waypoint updates around the local area and will allow the user to search local providers (waypoints/store), even without any connections, no communication, Internet, or cellular is needed to determine the location as well as accuracy radius circle. The Internet web communication provides more information such as push

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notification and messaging and local based services such as deals, advertising directly and automatically to the user's mobile phone.

[00200] Once you are in the vicinity of your destination and, a notification is sent automatically to the business Internet or web site and you will automatically receive the facility information along your waking route and in all directions around you .

[00201] No further action is required, there is no need to send a request or to access and search a database or central system.

[00202] Other systems must send a request to a central system, or to a database, and then must wait for a response. This takes time!

[00203] The disclosed unique approach results in no delay or waiting for communication or authentication and access time as there is no real communication between the tags/beacons and the user mobile device, the result are instantaneous association, directly between the tags/beacons and the user's mobile or navigation device

[00204] The RF tags/beacons broadcast their ID to be scanned and pickup by the user's mobile phone to identify the location of the user as proximity to the tags/beacon.

[00205] Additionally, the ID identifies the type of facility, store etc., e.g. restaurants, men's wear, women's wear etc. and the location in the store, e.g. front, back etc.

[00206] Each facility can provide information about the store e.g., automatic waypoint information as the user's presence triggers initiates automatically notifies the business or waypoint in the local area.

[00207] Do to the limitation of the mapping system currently used by the GPS navigation system the associated display method is our unique way to bridge existing devices like cellular phones, in-car navigation and other Bluetooth devices. The system provides an associated overlay navigation display method as a real-time floating display, or as a waypoint to overcome the limitations of GPS based systems and the existing mapping systems; especially indoors where each waypoint will be displayed over mapping or floor map images.

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[00208] The display method is one unique way to bridge existing devices like cellular phones, as a real-time floating overlay on a directional circular display to overcome the limitations of GPS based systems and the existing mapping systems.

[00209] The overlay add-up device/display works like a VOR and provides add-up display shows automatically the user location in the immediate area in a circle represent a radius of accuracy and proximity distance from the local detect beacon/tag.

[00210] The overlay displays over an existing navigation system, portable device or cellular phone without GPS support providing a circle that shown the location accuracy of the user on the local map.

[00211] The fact is: no digital maps are entirely accurate. A user needs to know which map makers are used by the product that they are interested in and check the maps for the area that they are concerned about. In addition some map databases are created from vector data while others are just scanned copies of paper maps. In addition to mapping data these same map makers can often provide Points Of Interest (POI) data. However, a software company might use the maps from one company and the poi data from another. POI data normally takes three forms. One is public buildings, parks, airports, and possibly geographic objects. A second is government locations that include specialized points lists like marker buoys, and airplane markers. Finally, there are commercial establishments that usually include some information about their product and contact data. Note that the location of commercial places is often derived from the street address and is not based on the actual lat/Ion location. Moreover there is the sky-high cost of digitizing and updating the poi and the waypoints.

[00212] The task is to provide a solution when the "user" will receive real-time Point Of Interest (POI) or waypoints in the area where he is automatically associate with a located proximity beacons/tags in the area, the waypoints information can be information that are real-time information updates in real-time and can be changed according to the waypoints and all according to a proximity detection of the RF tags/beacons ID in the area, the information can be used in these example applications:

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[00213] The user may wish to locate an empty available parking space in his vicinity. Just think of the empty parking spaces as waypoints the parking space occupied with RF beacon and sensor to find if the parking is empty, and the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details with US Patent 7,899,583 (included in the claim of priority and issued to the Applicant and incorporated herein by reference).

[00214] The user may wish to see and locate the real estate property available in his area according to his location, where an RF beacon can be installed in each real estate property to trigger more information to the user/ possible client when he reach proximity to the property.

[00215] The user may wish to locate a specific store in a shopping mall, each store in a mall is a waypoint, or a particular aisle in a department store, or a specific item on a shelf.

[00216] The user may wish to locate a specific conference room in a convention center, or a Point Of Interest (POI) in an amusement park or a Point Of Interest (POI) in a museum.

[00217] The user may wish to find the emergency exit route in a time of emergency or the first response team needs to navigate in a facility in an emergency situation.

[00218] The user may be looking for a train location in a station, or stops in a subway or underground train system. All of that is updated waypoints in real-time.

[00219] It is believed that the automatic waypoint updates revolutionize the GPS and Navigation Industry.

[00220] For the first time the user will know what he wants and when he wants and according to his location

[00221] The local business owner can introduce his content in real-time to the (navigation) users in his area automatically when the user access or enter to his store the contents can be deals, coupons, specials and provides more information to user about the business, the business in turn can benefit from statistically information about the client/s. such as habits, profile, loyalty and rewards.

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[00222] The GPS and navigation industry can tap to the huge local advertising market (estimated at 134B in US alone ...)

[00223] Automatic notification of user existence in the place/store/facility

[00224] Mall/store navigation solution inside mall/store.

[00225] RTP-return to parking-locate the place that you parked your car.

[00226] For example, a typical application could be:

[00227] A pedestrian asks the way in a mall to a specific store.

[00228] A pedestrian asks the way inside the store, to a specific aisle or product.

[00229] A shopper in a department store asks for a specific department.

[00230] A pedestrian asks the way to a Point Of Interest (POI). In an emergency, the first response team has to navigate inside a smoke filled building.

[00231] A store owner can use the notification and the knowledge of existence for loyalty and rewards

[00232] The beacons ID can trigger a link to exiting software and aware the local system of the user existence – such as:

[00233] A traveler is check in into a hotel/resort, the hotel/resort can provides with automatic check-in and interface to the hotel/resort front system.

[00234] A traveler is check-in into a flight in the airport, the airline provides the traveler with automatic check in to the flight when the traveler reach close proximity to a RF local beacon.

[00235] A customer are check into a restaurant or food service, the business will recognize the customer when he in proximity to the local RF beacon.

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[00236] The pedestrian reaches an advertising area or billboard that can be recognized by the user by being in a close proximity to the advertising area and provide the user with customize personalize advertising or offer.

[00237] A customer is entering a store/bank/facility front to be recognized for additional information or services.

[00238] The RF beacons/tags can serve to track employee's work times, including a check-in and checkout time from a designate area.

[00239] The infrastructure provided by local RF beacons can be integrated into a local dating system.

[00240] The local RF beacons with associate with the user mobile can create virtual secure zone for child or elderly or any care monitoring.

[00241] The location of the user as associate with the local beacons can be interface with social networking.

[00242] The RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking. the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details in US Patent 7,899,583 issued to the Inventor and claimed as priority herein.

[00243] The RF beacon can be installed or be a part of a vehicle to provide car application like payments security car broadcasting car tracking car communication and automatic car counting to provide transportation managements with statistically information automatically.

[00244] A system and method to provide a user information which is related to the Point Of Interest (POI), the navigation system provides detection and navigation references, position determination and information related to the object-Point Of Interest (POI) directly and automatically to the user interface-cellular phone upon arriving to a close proximity to the RF tags/beacons installed in the area.

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[00245] Moreover the application provides more than simply an icon.

[00246] At present, no prior art device utilizes the capabilities to display a real-time representation of navigating and get an update directly from the waypoints. Also most systems are designed for the old query type search where interface to Internet and or database central system is needed.

[00247] The navigation system automatically detects a signal directly from the RF tags/beacons installed in the waypoints, no communication needs to be established between the mobile phone and the RF tag/beacon not even cellular communication, and no pairing needed. Other systems must have bandwidth available, over which to send a request to a central system or to a database and then must wait for a response, or they need Internet connections. This takes time!

[00248] Even if the other systems have bandwidth, they are still based on the existing search concept where the user submits a query, searches and waits for the response. This is impractical. The navigation system provides the information automatically, without submitting any query, and the response is according to the user's location based on RF tags/beacons installed in the local area.

[00249] Again, most of the existing prior arts are based either on a GPS based system or the existing car navigator, that depends on a GPS too.

[00250] And the existing mapping that these systems use has the same limitations, described previously, and is impractical.

[00251] This navigation system bridges the gap between the GPS based navigation and provides a complete solution.

[00252] U.S. Pat. No. 7,031,875 Ellenby et al. describes a pointing system for addressing objects, and provides a system and method based on GPS and Internet/database communication, it is not exactly a navigation but an information based system that need the GPS to locate the user location so indoor services is likely out of the questions and the need for communication as

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well with GPS limits its availability and accuracy. It is not a real-time update of the waypoints and needs Internet and or central database communication.

[00253] The most common problem with today's GPS based systems is that the mapping and the waypoints are not updated on a timely basis. In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be about 2 years old. The new service like Google Earth provides satellite images that are almost 2 years old and for sure can't provide on-line real-time accurate picture of the existing area and the waypoints.

[00254] The disclosed technology offers a solution to this task by providing a system and method to generate automatically the waypoint along the user route ether indoor or outdoor the update is based on determine location of the mobile device indoor in proximity to installed RF beacons and the update information triggered by the location determination, such method is not exist in today navigation or mapping especially indoor.

[00255] The disclosed technology offers a solution that interactively guides the user to a desired indoor and outdoor destination.

[00256] The navigation system and method automatically updates waypoints, by means of an interface to an existing GPS based system, when each Point Of Interest (POI) will have an RF tag/sensor that will broadcast an RF signal that can be converted to a GPS waypoint, In response to the RF signal (from the tags/sensors,) the navigation system will execute the specified file/program that will trigger automatically, executing a waypoint generation program.

[00257] For some years, local governments in cooperation with various FM radio stations have been putting together an automated way to get real-time traffic data into cars so drivers can avoid traffic. Real time traffic information includes news such as: congestion, construction, traffic accidents, and recommended alternative routes.

[00258] An RF tag/beacon Bluetooth and or Wi-Fi will be installed at each Point Of Interest (POI). When each Point Of Interest (POI) will have an RF tag/beacon that will broadcast an wireless RF signal with ID that will provide an instant detection, the navigation or the application for local based services system will execute the specified file/program that will

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trigger automatically, executing a waypoint generation program and at the same time provides the business owner a notification of existence of the user in his vicinity to allow the business to provide the user with relevant messages or offers, more information or push message to the user cellular phone just by being in proximity to the RF beacon .

[00259] The "user" will no longer need to enter his way- points manually and then wait for the providers of maps or GPS to update their maps with the information (this can take about a year in some cases). This way the "user" will receive the information that he needs when he needs it and where he needs it.

[00260] It provides trigger information according to the beacon/tag, directly from the local area business waypoints and to the user's display device, the detection can be done without any communication In the event that more information is required and the business need to provide more information it may be necessary to connect to the Internet, its allow interaction/engagement as proximity to the RF Bluetooth beacon can trigger a specific application functionalities and provides automatic notification "I am here" to the business owner.

[00261] It is believed that sooner or later it will be a standard procedure to install a tag/beacon on every location of interest (waypoint) or any business will provide a waypoint information to the to provide "users" with the information. Most stores or POI/waypoints will be willing to pay for a tag/beacons or pay subscription fee to be on the GPS system providers that are able to show their location and information on a map. Or they will pay for an annual listing (similar to the yellow pages).

[00262] The System can interface with existing GPS.

[00263] Present GPS providers, map providers and search engines providers: City Navigator and Metro Guide Maps contain many thousands of attractions.

[00264] These include: Food and Drink, Lodging, Attractions, Entertainment, Shopping, Services, Transportation, Emergency and Government offices.

[00265] In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be about 2 years old. Listed Attractions

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include theme parks, museums, libraries, schools, parks and such. This feature is very useful in an unfamiliar area. Waypoints will be located automatically in the local area and plotted on the map screen. The waypoints can be stored on the GPS database for future access or store at the user mobile device .

[00266] The navigation system will revolutionize the GPS based systems and the mapping industry, from GPS, mapping companies' communication providers, car manufacturers to yellow pages and local guides; for the first time the user of a GPS navigation system will have an easy, reliable way to reach a destination.

[00267] The most common problem with today's GPS based systems is that the mapping and the waypoints are not updated on a timely basis. The navigation system provides a solution for this problem. Using the navigation system, the user will know where he is, be able to identify "landmarks" around him accurately, and receive automatic updates directly from the Points Of Interest (POI) in the vicinity.

[00268] The navigation system is based on RF tag beacons installed in the local area, each tag or waypoints has its own ID (identifying the waypoint by type, address, etc.). The tag beacon ID and proximity to the RF beacons will allow local detection and interface with existing or indoor application and navigation, GPS based systems, as a floating information display on the GPS map referenced to the user's location. The floating display will provide automatic waypoint updates and will allow the user to search local providers (waypoints/store and more information about the store/business, the detection allows the local business to have an automatic notification about the user whereabouts in proximity to his business and allow him to provide the user with more information about his store/business/deals.

[00269] The fact is no digital maps are entirely accurate. A user needs to know which map makers are used by the product that they are interested in and check the maps for the area that they are concerned about. In addition some map databases are created from vector data while others are just scanned copies of paper maps. In addition to mapping data these same map makers can often provide Points Of Interest (POI) data. However, a software company might use the maps from one company and the poi data from another. POI data normally takes three forms. One is public buildings, parks, airports, and possibly geographic objects. A second is

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government locations that include specialized points lists like marker buoys and airplane marker. Finally, there are commercial establishments that usually include some information about their product and contact data. Note that the location of commercial places is often derived from the street address and is not based on the actual lat/Ion location.

[00270] Moreover there is the sky-high cost of digitizing and updating the poi and the waypoints.

[00271] The task is to provide a solution where the "user" will receive real-time Point Of Interest (POI) or waypoints in the area automatically to his existing navigation system or to his cellular phone, the waypoints information can be a real-time information update in real-time and can be changed according to the waypoints.

[00272] A cellular phone application, which the user will scan the area for exiting RF Bluetooth beacons or Wi-Fi beacons will receive data and more information utilizing the cellular phone's Bluetooth capability.

[00273] The system can trigger application as well as link to existing systems and software. A notification can be sent to a web, email a cloud application or even social network, The navigation system will interface with existing in-car media system and in car navigation systems.

[00274] It is understood that the waypoint or Point of Interest (POI) will be represented by the following suggested ID examples as part of the beacon ID to be recognized by the user Bluetooth mobile device (cellular phone), according to the type of the POI:

ID Code	POI Type	Waypoint Cat. Type	ID Code	POI Type	Waypoint Cat. Type
32	Food/Restaurants	Food	34	ATM/Banks	Finance
33	Gas Station	Information	35	Department Store	

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36	Apparel	Store
37	Sports	Store / Information
38	Books video	Store
39	Jewelry	Store
40	Toys/Photo/Elect.	Store
41	Music	Store
42	Gifts	Store
43	Furnishing	Store
44	Service	Service
45	Computers	Store/Service
46	Hairstyle/Cosmetics	Store/Service
47	Office	Office
48	Security/Police	Service / Emergency
49	Children's program	Service
50	Social Affairs	Religious Service
51	Religion	Religious
52	Phone	Service
53	Travel	Transportation Service
54	Parking	Transportation Service
55	Guest service	Service
56	Library	Service
57	Transportation	Management Service
58	Municipal	
59	Post Office	Service
60	Government	
61	Market	Store/Service
62	Alarm	Emergency
63	Emergency	
64	Hotel resort and cruise ship	
65	Education facility, school, university	
66	Sport facility, sports arena, stadium	
67	Conference and show	
68	Amusement park	
69	Implements as mail and address	

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70 Implements in a road as road sign or transportation entity

[00275] Be remember that the ID above is only suggested example, the fact is that part of the beacon ID will be to recognize the Facility/store type the location to provide instant detection and location determination by just being in a close proximity to the RF beacon in the area.

[00276] The navigation system enables remote and local update of the local floor plans and the information about the local area and waypoints business in the area, when the location's indoor application can be triggered to download at the destination. An example of this would be at the entrance of a shopping mall, department store, amusement park, museum, parking garage or the downtown area of a city where a sign or the shopping mall information sign will provides direct information a trigger to download the local application.

[00277] The system can work inside a building whereas GPS cannot. Local detection is obtained via popular Bluetooth interface.

[00278] The system provides information about each facility/store, including information about the type of the facility, for example: type of store or product etc., the information trigger to deliver to the user mobile device by being in proximity to the RF beacon ID that installed in the local area.

[00279] By providing the ability to locate a the user in an area using a Bluetooth enabled device or a cellular phone with the navigation application, the system overcomes the anxiety of "Where am I" and also facilitates finding a parked car later via the RTP (Return to Parking) feature.

[00280] The system has the capability to perform all the functions of a search and can become the "Next generation search out of the box".

[00281] The navigation system can be an attractive addition to existing deployments of Wi-Fi and Wi-Fi hotspots and a feature for business and cities that deploy Wi-Fi.

[00282] In case of an emergency or security situation, the system can provide authorities with information.

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[00283] Utilizing the navigation system, the facilities (waypoints) in the vicinity around the "user" car are displayed on a floating overlay using either a cellular phone application, or a standalone device, or an existing installed navigation system with or without any mapping, the information can be pushed to the user's device when he in proximity to the area.

[00284] The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[00285] The option of downloading a floor plan can be exercised either remotely or locally as part of mapping or navigation application.

[00286] With the navigation system, the user will have the information that they want, when they want it, where you they it ...(and at an affordable price) Once you are in the vicinity of your destination and you switch on your navigation device, you will automatically receive the facility information along your waking route and in all directions around you.

[00287] Additionally, each facility type can be ID-coded apart of the beacon ID to identify the type of the store etc., e.g. restaurants, men's wear, women's wear etc. the store type, real estate property, garage sale location, special sale and all up to date real time information that can't be displayed and located in today's navigation system, and tapping to the local business industry is known as local advertising.

[00288] Each ID-coded as part of the beacon ID can be trigger accessed to obtain complete information about the store e.g., automatic waypoint information.

[00289] The system can be operate on a cellular phone, and navigation system and is not limited to a GPS navigation system.

[00290] Moreover, the navigation system can solve the "RTP" (Return to parking) problem, where many forget where they parked their car. The system has an option to save the location on the "cellular phone-parking detector" application, which will make it easy to locate the parked car.

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[00291] The navigation system is designed for global use and is not limited to malls, stores, amusement parks, museums, sports stadiums etc. It can be implemented in parking garages or parking spaces metered or not, almost anywhere and in any place even in any infrastructure.

[00292] It is envisioned that in the future all new construction/infrastructure will have the beacons/tags included in the design or built in the structure..

[00293] One feature of the proposed invention integrates the navigation as part of the NAV4 concepts where it will provide complete solutions for local navigation in an area where the GPS and GPS mapping just can't provide accurate and updated information that is so essential to the user.

[00294] A typical application is navigating a pedestrian in an environment like a mall, department store, specialty store, conference, trade show, amusement park, university, hospital, school, municipal building, museum, subway, train station, airport, down town center, any type of parking facility ...or any place when and where GPS cannot be provided or is not accurate or precise enough. The system can be used for navigation by first responders to emergencies or disasters.

[00295] The navigation system is part of a broad suite of applications that include a complete solution to the "user" from the time that he parks, or begins looking for a space to park his car, walking to the store/mall to when he wants to return to his parked car, looking for the place that he parked.

[00296] The suite may include:

[00297] Parking detector-and navigation to the empty available parking space.

[00298] Nav4 mall/store navigation solution inside mall or store.

[00299] RTP-return to parking-locate the place that you parked your car.

[00300] For example, a typical application could be:

[00301] A pedestrian asks the way in a mall to a specific store.

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[00302] A pedestrian asks the way inside the store, to a specific aisle or product.

[00303] A shopper in a department store asks for a specific department.

[00304] A pedestrian asks the way to a Point Of Interest (POI).

[00305] In an emergency, the first response team has to navigate inside a smoke filled building.

[00306] A system and method to provide user information which is related to the Point Of Interest (POI)

[00307] The navigation system provides detection and navigation reference, position determination and information related to the object-Point Of Interest (POI) directly and automatically to the user interface-cellular phone without any communication help of Internet/web or cellular needed . . .

[00308] Special operation mode:-Shopping- NAV4SALE-provides navigation to the special sale item in a department store. A new unique tool for the business owner as well to the customers-to navigate and locate an item in a store/mall that's on a special sale, will provide the "user" a way to navigate in/out door for the "waypoint" represents the special sale, coupon, special event, promo etc ...an add-on to local advertising.

[00309] The local advertising market is estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of a local strategy. Due to the lack of availability of the GPS indoors as well with the limitation of its accuracy outdoors and the non-updated mapping that is provided today by the mapping and GPS industry, there is no real tapping to this huge market.

[00310] The navigation system can bring a new life to the navigation and mapping industry by providing a unique innovation that combines the GPS and the existing navigation as well as the cellular phone users with an indoor navigation based on the local map/mall that will provide the user a navigation to his desire location in the mall/store to the right store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. A new unique way to bring the customers to the product in sale . . ., direct the customer directly to the isle and to the product that you want to move. The store will also have an option to

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deliver more content (advertising, sale, coupons, promo etc ...) to the user when he approaches the store or is already inside via push technology to the user's Bluetooth enabled cellular phone.

[00311] Special operating mode:-Museums- NAY4Museums NAV SHOW and NAY CONFERENCE provides navigation and interactive information from the museum's show or conference exhibition to the "user's" cellular phone device via Bluetooth interface.

[00312] Explore museum or conference show exhibits in a new unique and easy way, find your way around when navigating on the floor map of the museum or conference, indoor navigation, navigate to exhibits, restaurants, cafes, lavatories etc., all to the "user's" navigation or cellular phone.

[00313] Any museum, conference, or show provides the attended a map to the exhibits, some also provide additional audio device (headset) to get more information on the exhibits.

[00314] The navigation system will provide a unique indoor tool that will allow the attended to navigate the museum, conference or show in an easy way directly to his Bluetooth enabled cellular phone, when he reaches his desired exhibit he will allow to download directly to his cellular or Bluetooth headset information about the exhibits. An indoor navigation to the exhibits as well to the restaurants, cafes, lavatories etc., all to the "user" navigation or cellular phone and based on the facility map.

[00315] Special operating Mode: Navtrain- For all the users of mass transportation system, the navigation system will allow, locate and point the "user" to the exact station or location on a route, an easy way to navigate in the train, subway, underground system, a new way of "sub-way" or bus mapping in/out door and directly to the user navigation or his cellular phone. Every day millions of people are using the mass transportation system, trains, subways, buses, each of the passengers depend on the transportation map for the route information as well as schedules and additional services provided by the transportation system. Most of the passengers today carry with them a cellular phone.

[00316] The navigation system will provide the passenger with the navigation inside the transportation system directly to the passenger's Bluetooth enabled phone, the passenger will know the exact location/station on the route as well with additional option information like

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schedules. A new add-on service to the transportation providers as well to the passengers, utilizes the indoor navigation method and the ability of the transportation entity to use the RF beacon installed in a transportation facilities to have add-on to transportation management control system .

[00317] Special operating mode:-Parking- NAY4PARKING describe in 2 patent applications, provides empty parking space detection and navigation. where is the RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking. the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details in US Patent 7,899,583 issued to the Inventor and claimed as priority herewith.

[00318] A new generation of urban parking innovation that answers the most demanding need of any driver knowing where to park ..., or more precisely, find and navigate to the empty parking spaces in and around the driver. It will also provide the answer to "where did I park my car?" syndrome, when returning to the parked car. In our society where time, convenience and comfort are precious commodities parking is a major headache.

[00319] Parking Detection System is the next generation of urban parking and the answer to the most demanding need of any driver-Where to park?

[00320] The navigation system provides a method of self organizing parking system will enable municipalities and other parking authorities to easily identify, exploit and manage revenue opportunities while at the same time providing better service at a lower operating cost. With the implementation of the navigation system, navigating and detecting available parking spaces will become part of the information revolution.

[00321] With the navigation system, drivers will save time and reduce the frustration of hunting for parking spaces, and will also save money on gas use and car maintenance costs.

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[00322] By using and modifying existing technology, our system will integrate easily with other transportation and communication systems. The RF beacon can be attached to existing parking meters, and in the future will interface with them and eventually will replace them.

[00323] Municipalities will have better control and centralized monitoring of their parking space inventory, resulting from the new generation of urban parking.

[00324] Special operating mode: NAYRealty - A new unique tool to accommodate the real estate industry by providing the seller/the real estate agent as well as the real-estate customer to locate and navigate to the available real estate property in the "user" area, according to his location and directly to his GPS navigator and/or cellular phone. The user may wish to see and locate the real estate property available in his area according to his location, where an RF beacon can be installed in each real estate property to trigger more information about the available property to the user/ possible client when he reach proximity to the property.

[00325] According to the Newspaper Association of America, the real estate advertising market is estimated at$11.5 Billion. Recently Mynewplace.com joined apartments.com and rent.com in the $3 Billion on-line apartment listing. **ZILLOW**, a new startup company just raised $32M in founding with the basic idea to put your house on Google Earth-satellite mapping. Google, Yahoo, AOL, ASK and Microsoft are looking to develop real estate products.

[00326] The navigation system brings the listing to the user's hand, by combining the GPS navigation and or cellular phone the user will be allowed to get the real estate property in his area updated according to his location in real time.

[00327] The user even will have the option to "search out of the box" of property in his area. The navigation system will serve as a new tool for the real estate industry as well to the search engine for the benefit of the seller/the real estate agent as well as the real-estate customer.

[00328] Special operating mode:-NAV4STORE and NAVMALL provides navigation inside a store/department store to a specific department/aisle or specific product, with the option for advertising methods and special promotions. Explore the indoor mall or inside a department store, navigate to the right place or the store or the department that you need.

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[00329] Navigate on the mall map/store mapping to find your way around using your cellular phone or navigation system without a GPS. It will be a new kind of service and a new marketing strategy for the malls/store business owners. An add-on to local advertising.

[00330] The local advertising market is estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of local strategy. Due to the lack of availability of the GPS indoors as well as the limitation of its accuracy outdoors and the non-updated mapping that is provided today by the mapping and GPS industry there is no real tapping to this huge market.

[00331] The navigation system can bring a new life to the Navigation and mapping industry by providing a unique innovation that combines the GPS and the existing navigation as well as the cellular phone users with an indoor navigation based on the local map/mall that will provide the user a navigation to his desired location in the mall/store to the right store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. The store will also have an option to deliver more content (advertising, sale, coupons, promo etc.) to the user when he approach the store or is already inside via push or Internet to the user's Bluetooth enabled cellular phone.

[00332] Special operating mode:-NAV Amusement Parks-Theme and amusements Park navigation, navigate to your desired attraction as well as a new way to register a "fast pass" kind off lane ...all in an easy way to the "user" cellular phone without the need for GPS. Provides a new media and-on service.

[00333] Ever wonder what it will be like to navigate inside the amusements park to the desired attraction, to know the schedules of the show events at the attractions and even to get your "fast pass" from a remote instead of standing in line ...With the navigation system, all this can become a reality and go directly to your cellular phone without the need for a GPS. It is understood that the present invention can provide a new tool and service to the benefit of the amusements parks as well to the user.

[00334] Special operating mode:-NAVSIGN-will pro- vide the user with automatic generating waypoint of the road sign to be displayed on the user navigation and or cellular phone or the car

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navigation or on the dash board as a way for secure driving, the information can interface to the car computer for example automatically slowing down when it enters a school zone-NAVSIGN.

[00335] Special operating mode:-NAV EMERGENCY: One of the important features of our indoor navigation techniques will enhance the ability of the first response team to navigate within the buildings in which it has been deployed.

[00336] The navigation system provides a method that is a low-cost, reliable solution for firefighters and other first responders, inside buildings, to navigate where a GPS is not reliable-indeed, the GPS signal may have been disabled temporarily to prevent exploitation by terrorists, or even more likely no signal can be received at all inside a building.

[00337] The navigation system envisioned this limitation of GPS based systems, and is intended for an environment that is potentially much less "friendly", the environment inside a building that first responders encounter may contain smoke, dust, or flames, and is intended to leverage advances in ubiquitous RF/Bluetooth tag technology.

[00338] The navigation system will exploit the capability of storing critical building information, such as the floor maps and the emergency escape plans, for retrieval and navigational assistance via a Bluetooth enabled cellular phone, when and where it is needed. Moreover the navigation system can serve as a navigator for the emergency exit route when and where it is needed. Each user can download the emergency exit floor plan and escape with the knowledge of his exact location in that route.

[00339] Aspects of the scenarios to be included:

[00340] Identifies and tracks the user (a first response team member).

[00341] Provides the user with navigation information and directions for safely exiting the building.

[00342] Provides location information of all team members, via an ad hoc network of radio terminals that combine RF/Bluetooth and allow communication chat and messaging between the team members without need for Internet or cell communication such option is not limit to the first response team but to a user in emergency and non-emergency use.

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[00343] From the outset, the navigation system was been designed with the capability to utilize existing technology so it can be deployed as a stand-alone system, or in tandem with existing systems.

[00344] With the implementation of the navigation system, a FIRST RESPONSE TEAM will be empowered to navigate and find its way in a case of emergency or a disaster. This capability can be a critical life saving power in modem congested urban living conditions that was not available before now.

[00345] It is believed that implementation of the navigation system will assist counter-terrorism activities and more importantly will help the first response teams to save the lives of people trapped inside buildings.

[00346] Waypoint Navigation

[00347] A waypoint is a fixed location with known address location, longitude and latitude and coordinates. The navigation system is capable of storing a database of waypoints for the following purpose:

[00348] Waypoints mark a destination, a point along the way to a destination, or a point of reference. Normally, navigating, a "route" consists of one or more waypoints. To traverse a route, the user navigates to the nearest waypoint, then to the next one in turn until the destination is reached. The system has the ability to compute a great-circle route towards a waypoint, enabling them to find the shortest route even over long distances. The system enables users to locate a destination on a map and define it as a waypoint. The system is intended for navigation; it can generate a suggested route between two waypoints, based on the cartographic database. The system indicates the user's current location and gives advance notice of an upcoming point.

[00349] Because the system knows the waypoint positions, and the distance between them it, it is easy to determine the "user's" exact location.

[00350] Map Matching

[00351] The navigation solution is further enhanced, although it is not essential, when the system knows that the person or object being located is traveling along known routes on a map;

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for example, the system can assume that people can only follow certain routes in a mall. This is priori information that can be used to "force" the estimated position to be on the nearest point on the possible routes. The constraints of indoor construction similarly can be used to refine estimates of the position of a person or object moving within a building-people and objects do not pass through walls, they pass along corridors and through doorways. It is the best solution for a system in case of an emergency or for a system for homeland security or a system to locate and inform the subway location, a good example is the hotel exit floor map.

[00352] In all, the unique method can be summarized as follows:

[00353] Direct communication between the area (way- points) and the user (navigation/GPS)

[00354] Automatic waypoint generation in real-time according to the user area

[00355] Indoor/outdoor even without GPS

[00356] Business model when the business/store owner will be subscribe to the listing in the navigation/GPS mapping

[00357] Provide overlay floating model to be work even without mapping

[00358] No Internet or cellular communication is needed to detect and determine a user's location for additional location based services (LBS) information and push and or data Internet service needed.

[00359] Can interface to the existing system and link to existing software and hardware system.

[00360] The option of search is done locally on the user device, no central database or Internet search needed.

[00361] Bluetooth interface to cellular phone, will run as application on the Bluetooth enabled device, such as a cellular phone.

[00362] Provides indoor navigation and indoor facility map and or floor images- guide and navigation.

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[00363] All global positioning system (GPS) navigation systems lack of real-time displays of the waypoints around the driver/user route, most likely, the information of GPS maps may be old and therefore inaccurate.

[00364] The navigation system provides a system and method for generating and updating in real time a navigation's waypoints automatically along the route according to the user associated with local detection of RF beacons installed in the area and will for the first time trigger an a delivery of real time waypoint information along the user route directly to the user's navigation and/or his cellular phone.

[00365] The navigation system will enable a circular omni-directional display on the map or floor images floating overlay on existing navigation map or floor mapping or indoor floor images .

[00366] The waypoint data trigger generates directly from the way- points beacons ID, no Internet or cellular communication is needed to determine the location.

[00367] The navigation system will bridge the existing navigation system and GPS mapping to new real time information according to the user's location.

[00368] The navigation system will allow for the first time the navigation and GPS industry to tap to the local advertising market estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of local strategy. Due to the lack of availability of the GPS indoors as well as the limitation of its accuracy outdoors and the non-updated mapping that is provided today by the mapping and GPS industry there is no real tapping to this huge market.

[00369] It is believed that the navigation system can bring a new life to the Navigation and mapping industry as well to the cellular providers by providing a unique innovation that combine the GPS and the existing navigation to the real time information directly from the waypoints, which can be referred to as a COOLSPOT.

[00370] This invention is directed generally to the field of navigation and, more particularly, to such a method to be used indoors or outdoors in a mall, store, buildings, department stores, and to provide local based services directly to the user's navigation or cellular phone.

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[00371] The proposed applications have identified and resolved a great deficiency in the technology available for local businesses. LBS represent a huge advertising and mapping market-estimated at over $150 billion a year. It represents a big opportunity in the navigation market that has not been explored yet

[00372] Existing System and Industry Trends:

[00373] Local mapping today is mostly paper: Mall maps, store maps, mapping of department stores, commercial buildings, hospitals, schools, campuses, municipalities, shopping centers, downtown districts, indoor facilities, building maps, parking areas, parking garages, amusements parks, subway systems, transit maps, museum maps, area attractions maps, hotel and resort maps and even more importantly the emergency maps and procedures posted in buildings.

[00374] Factors in Local Mapping

[00375] Local maps can be of either indoor or outdoor locations.

[00376] Local maps are available on paper, on the web, and in some cases on a kiosk in the facility.

[00377] A high degree of accuracy is needed in order to provide usable maps for navigation indoors-less than 10 m-to a store or even a parking space.

[00378] GPS cannot provide acceptably accurate mapping as it is only accurate to within 100-200 feet. This is the reason that the GPS industry does not provide this type of mapping. The same is true for cellular network providers, as the accuracy is also 100-300 feet, and then only when the signal is available. Signal availability is often a problem indoors and also when it is most needed-in an emergency situation when most of the cellular network fails due to high demand. Again, this is the reason that there is no local mapping available for cellular users. (Local mapping equates to accuracy in finding a store, room, or parking level within 5 m.)

[00379] At this time there is no indoor navigation solution. The most recent technology provides access to a user's location through a combination of group "social networking" and a "buddy list".

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[00380] Most technology available today attempts to "locate" a moving "user" in an area, the present invention reverses that idea and lets the "user" navigate the local area on the local maps, indoor navigation compared to outdoor navigation, pedestrian navigation is more than locating and navigating, most likely they are at or near their destination already. There are two possibilities, either they are in unknown surroundings and their task will be to explore the surrounding or they are looking for a specific product-their defined goal is like buying a new pair of shoes or getting a book or just going to shop around, exploring a new location, new deals, specials sales, or simply sightseeing.

[00381] The theory is based on the belief that "you are what you do" meaning, the services, specials, sales, coupons, discounts, and the like are one key element.

[00382] The main task of indoor navigation is to show the user where the specials, sales, and coupons are and direct-navigate the user to them and at the same time provides the business owner with a marketing tool that as of now is not exiting . The integration of multimodal journey planning and guidance to dynamic waypoints, sales, specials etc.... and complex public interchange facilities are not adequately addressed by existing systems.

[00383] In some aspects, indoor navigation looks simpler than outdoor navigation. For instance, the geographical area covered is much smaller and the expected speed of travel-walking-is much lower. However, other aspects make indoor navigation much more challenging. First among these is the unsuitability of GPS and related technologies. Second is that in a complex indoor environment the requirements are more stringent. For example, vertical positioning of the topology and the need for accuracy less than 10m-to the store, the product, and even to the aisle or the parking space-cannot be achieved with today's existing system.

[00384] The indoor market represents much greater potential than outdoor navigation, as on average people spend more than 90% of the time indoors ....

[00385] The Objectives and Goals Behind This Concept: The technology behind the navigation system is quite simple-a direct communication between the user's device/cellular phone, Bluetooth enabled device, and a Bluetooth tags/sensors/beacons installed in a known

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location in an area/ building/store/facility without relying on GPS, centralized servers, Internet bandwidth or even cellular communication-they can be supportive but are not essential.

[00386] The main concept is to use existing off-the-shelf technology (Bluetooth) with small modification and devices with a minimal cost of deployment and to provide a simple indoor/pedestrian technology which can delivers accuracy with an integrated suite of applications especially designed for the user/shopper indoors, the system is based upon RF beacons Bluetooth or Wi-Fi installed in the local area to be scan by the user device – cellular phone and use the proximity scan beacon ID and signal strength to provides an instant detection a notification of existence to the business owner and trigger delivery of update local based information all without even exchanging a real communication (no paring etc.. needed) with the proximity beacons.

[00387] The System Includes:

[00388] Local mapping or local floor images – the indoor view of the facility as part of the application, the facility can offer a download or participating from a proximity information sign or the store/mall/building information to trigger download the application or ability to pre load the maps as part of navigation or mapping application before reaching the area or download from the web according to location determine by the RF beacons.

[00389] Ability to have special navigation software either as an add-on to existing navigation on the user's cellular phone or existing navigation system (car, mobile) using the Bluetooth beacons to determine the exact location and trigger applications.

[00390] Ability to deploy Bluetooth beacons in the local area where the beacon will broadcast ID to be known the location-waypoints and trigger additional information and or local based applications and to provide the infrastructure needed to guide navigate in the area. A very low cost and fast deployment beacon system.

[00391] The ability to use the log of the "user" Bluetooth ID or the Bluetooth ID as a key (NOT THE CELLULAR NUMBER) for future marketing purposes or for emergency use. This aggregation of data with association to proximity Bluetooth beacons ID will be in valuable to retailers, business etc. Bluetooth enabled cellular phones can be used as beacons.

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[00392] The beacons-parts of the navigation system are Bluetooth tags/beacons installed in known locations in the area/facility and represent "waypoints" where is the beacon ID can represent the facility type, store/ special sales, places etc. and the location in the facility location....

[00393] The scanner detection part of the application -whenever a mobile phone or mobile device with a Bluetooth switched the Bluetooth on and loaded with the application, it will periodically scan the area for Bluetooth beacons; proximity to a tag/beacon and the tags/beacons ID as well with signal strength will determine the "user" location on the area/ facility map and will trigger an automatic notification automatic check-in to the business owner to trigger application with possible a link to existing system to provide the user and the business owner additional information just by being there an use the method above.

[00394] The navigation-can be plotted between way- points/store/places on the map.

[00395] In regards to the sale sense-marketing tools, the system works by passively observing the initial part of the scanning of movement. The proposed system does not monitor or listen to conversations or text messages. Nor does the proposed applications transmit or intercept any information or interfere with the mobile network operators in any way. The navigation system is a scanning detector (not a receiver or transmitter) which can observe the unique Bluetooth ID/key set of the device (not a telephone number or name ...) with association to the beacons ID which the device was near and aggregate resultant data to be server for habit and/or preference for triggering content delivery.

[00396] Sales sense represents a method to use dynamic user input profiling with proximity beacon ID installed in the known location indoors and outdoors for empowered presence and trigger content delivery for a real life interaction and all under the user's complete control and without compromising his privacy. The paradigm of proximity-based discovery and communication enabled by Bluetooth technology can be very relevant in Ambient Intelligence as an enabler for a situated interaction.

[00397] The navigation system explores the use of predefine user input (user profile or preference) as a key driver for situated interaction and trigger content delivery according to the

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user profile/preference. The approach is to use of RF Bluetooth beacons installed in a known location in a local area to trigger action witch associates the user cellular phone ID and or profile / preferences beyond self-exposure and introduces a method that can trigger actions.

[00398] The approach to the use of Bluetooth ID of the beacon beyond self-exposure and introduces as a technique in which the system can recognize the Bluetooth ID as explicit instructions to trigger actions/process.

[00399] Firstly, because it has an extremely Low entry barrier, Bluetooth is a widely available technology. Most of all phones include the Bluetooth, and setting new Bluetooth device ID is normally a relatively simple task that can be accomplished with the base functionality of any mobile phone. This easy availability is of huge importance in enabling social practices around the technology and represents a major difference to other sensing and interaction approaches that, albeit more sophisticated, may require specific hardware or software in personal devices. Secondly, the use of Bluetooth presence for situated interaction combines very well implicit and explicit forms of interaction, in fact blurring the distinction between them. Simply by scanning the proximity Bluetooth device, people are already part of the situation and implicitly engaging with the system.

[00400] This continuous, flow of presence information can be fundamental in the aggregation of situated content and may act as an important catalyst for more explicit forms of interaction. This is what mainly differentiates interactions based on Bluetooth presence from other interactions.

[00401] The chosen methodology combines a user define profile encode into the Bluetooth device by setting up a user like VIN number, with user privacy as a priority, the profile is encoded into the user Bluetooth device with an algorithm sequence protecting the user's privacy.

[00402] It provides important practical implementation of the Technique and on its usability within the complex set of social phenomena that characterize situated interaction in a public places without compromising the user privacy. Its effectiveness and simplicity can make it easily adoptable for applications like local social networking interactions, near field communication like secure transactions, payment methods, secure recognized methods and trigger secure

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processes and delivery of direct content according to the user profile or preference, all again without compromised user privacy and provides the user with complete control all the time. The method can be integrated and provide privacy and secure transaction to empower application that may otherwise exploit user ID, his profile and privacy as such the method can provides a secure payments transactions.

[00403] Every day millions of people access the Internet and enter their profile, personal information, or answer questions about their preferences in order to access a service / site, to get incentives, coupons, specials, etc... The sites use the information for marketing and in some cases share or sell the information. Recent research has found that most people are willing to give information for incentives.

[00404] Using the profile and records, the surfing habits of the user (IP) is the way that all the search engine companies make money on the Internet. At the same time they try to direct the content to the user according to their profile/habits.

[00405] But what about real life? People spend more and more time indoors (according to recent research, people spend more than 90% of their time indoors).

[00406] A scenario of searching for stores, items, special sales, and coupons according to our desire is repeated again and again... The question is how can the system transfer the success of the Internet marketing tool and the easy search for real life?

[00407] That is the main idea behind the navigation system – what if a system can take a profile / user statistics or even user input with them anywhere and provide one or more intelligence marketing tools. Moreover, the user is in complete control over their privacy, they can just shut the application off.

[00408] In the disclosed navigation system, the user has their profile sales preference and they are encoded into the user's cellular phone to be associated with the proximity beacon ID installed in the local area . (There is 3 ways: A. set segment - the segment keys are not unique and help to setup the user segment only. In that case the key is not unique. B. To generate a unique key – to be used like the Internet IP. C. Create a dynamic key and multiplies profile according to location/user preferences.

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[00409] The profile can include: Gender, age, and sales preference (interest), and does not include any personal profile. It may be the same as seeing the user and recognizing their gender, age, and other preferences just by looking at the user. The user is not revealing any kind of information that most sites ask for in a registration process and no personal information like name, address, or telephone number is exposed.

[00410] As part of the suite of LBS application, the user's phone will scan the area for the tags/beacons. For example – by being proximity close to the directory stand in a mall a decoding of the user key will be processed in order to allow the user preference segments and trigger delivery to the user with ads, specials, and incentives according to their profile as well as providing again the business owner with the best marketing tool- knowing his customers they profile and habit all using a very low cost RF Bluetooth beacons installed in the area and associate them with the user Bluetooth device-the cellular phone.

[00411] "Your customer is telling you what they want, are you listening?"

[00412] The main idea behind this is to provide the user with pin-point content according to their desired preference at the location trigger by the proximity beacons ID and also direct /navigate them to the desired location where they can find the store/sales/special/coupons or the information that they are looking for able to get meaningful data around shopper habits and store layouts statistics, as well as to help them partner up to offer better loyalty incentives to their customers through programs that extend beyond single storefronts, its sensing second-by-second a shoppers interest about specific product, place and can provides the business owner with a complete marketing tools not available until now and at the same time provides the user with offers directly from the business according to his habit preference profile.

[00413] The sales sense, user preference module is an add-on to the sales sense marketing where it joins the user behaviors module to create a very unique LBS business and marketing model. Imagine a potential customer standing in a crowded store aisle, feeling overwhelmed by all the choices. What if you could just reach out and give him or her something to help with the decision – a coupon, product information, discounts — right at that moment? Content marketers will soon have the ability to do this and a whole lot more just by implementing our method.

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[00414] Sales sense-Shopping Behavior: How consumers decide what to buy and when is going to drastically change. Winning marketing need to provides and will require getting exactly the right content in the right place at the right time with even more precision. Shoppers will have the ability to collect real-time information, comparison pricing, discounts and other helpful, highly tailored data as they walk through a store or browse near particular items. It will be imperative to produce well-timed, compelling content that is useful in those crucial moments before a choice is made. Sales sense – next generation marketing tools, from coupons and giveaways in stores to tours of museums to airports that provide real-time flight information, the possibilities are endless.

[00415] Consumers will start engaging with content in a whole host of new ways. Rather than just providing information suitable for a web browser or even a mobile user, marketers will need to think about ways to provide content that will be of value to users as they live their lives. From businesses to city parks to, the system provides a user tools to access helpful, real-time data like never before. As recently published research showed that on average people spend 90% of our time indoors. The proposed invention allows an effective integration of on-line and off-line shopping.

[00416] Moreover, according to research, indoor navigation may be more important than outdoor navigation and may represent a huge new market.

[00417] Our technology allows shopping centers, malls, department stores, buildings, airports, train stations, exhibition centers, museums, and amusement parks to understand the way that their customers or passengers flow through their premises. At the same time it provides the user/shopper with unique indoor navigation capability without compromising user privacy.

[00418] Our innovation will allow, for the first time, the navigation and GPS industry to tap into the local advertising market, estimated to be $134 Billion in the US alone.

[00419] Our technology provides a reliable method for identifying the path habits and the behavior that people take through an area. There are a number of advantages to our technology including:

- Extremely large sample size as mobile penetration is above 90%,

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- Shoppers remain anonymous,
- Accurate to within 2m, and
- Based on a Bluetooth technology.

[00420] For retail areas, malls in particular, the advantages of understanding shopper behavior are significant. Such information can assist the mall to:

- Evaluate and improve their retail tenancy mix by identifying which stores shoppers consider complementary,
- Identify underutilized areas in the mall,
- Understand the impact of anchor stores on the mall,
- Measure the implications of particular promotions or center events,
- Assist with planning day-to-day mall operations,
- Provide add-ons for the shoppers,
- Provide shoppers with a "web" like shopping experience,
- Provide shoppers with incentives /advertising,
- Increase security ,
- And in an emergency provide the shoppers with alarm and notification, and
- Allow shopper engagement with the store, the RF beacons can become the small neighborhood store by recognize the shopper, what is missing from the on-shopping.

[00421] Our technology is the only system on the market today that can gather information on shopper paths continuously and accurately based on locally installed RF beacons without any need to establish any communication relationship between the user cellular phone and the beacon

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(no paring or any communication needed to determine the location) and all without compromising the shopper ID or their privacy.

[00422] The various methods disclosed can also provide a way of surveying the behavior and preferences of the "user" shopper simply by observing the signals (encoding Bluetooth naming key) given off by their mobile phones and associate it with the proximity beacon ID which they are near and at the same time provide the shopper with a unique special application for indoor navigation triggering a local based services applications.

[00423] The present invention provides a next generation approach to the location based services (LBS) market, especially to indoor applications and to areas where a GPS cannot provide accurate navigation.

[00424] The data collect using the disclosed technology can be used to provide trend reports showing which shops are most visited and at what times, whether there are sufficient public facilities to serve the visiting shoppers or whether more security staff are needed to name only a few of the potential benefits. Ultimately, the collected data can provide assistance to shopping centers to become more in-tune with their customers so that they can create better, more pleasant places to visit.

[00425] The proposed analytics can turn shopping center/department store/store into finely tuned sites, enabling mall/store owners to direct the flow of traffic efficiently around the information coming from the user to the benefit of the user and the business owner to provide services such as VIP personalize services, and the like.

[00426] In contrast to alternative techniques, there is no device that tracks the user cellular phone. In the disclosed methods the user device/ cellular phone is the one that scans and tracks tags/beacons along the route, each scan includes the beacons ID and the user device mobile phone ID, and while these keys help track the movement of the signal and its owner, they don't reveal the identity of the user. This is a more precise method than what Google maps uses to detect a general location on a mobile phone by cell towers which are accurate between 300-1000m compared to our accuracy which is below 10m.its allow the business owner to be notify about the user existence in his vicinity and allow sending the user offers/deals more information

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and at the same time collect very important information to the business owner such as habits, profile, preference of the user to provide precise contents directly to the user cellular phone.

[00427] Example of Scenarios:

[00428] A user in a mall can use a local guide and navigation application suggest to him to download at the mall/building/facility or have the application already as a cellular phone mapping application.

[00429] As part of the application the Bluetooth on the user's mobile phone will scan signals from known locations-Bluetooth beacons and will determine the "user's" location on the local mall map (the same way as a GPS) with accuracy of less than 5m. (More beacons with LESS signal range=more accuracy)

[00430] For example, the Bluetooth beacon can broadcast an RF signal that includes its position coordinates (e.g., latitude, longitude), which can be detected by a mobile device. The position coordinates can provide a third location accuracy for the current location of the mobile device by virtue of the mobile device adopting the position coordinates of the beacon as its own position coordinates.

[00431] The known locations of a number of beacons in a geographic region (hereafter a "beacon infrastructure") can define a geofence that encompasses the geographic region.

[00432] In some implementations, the beacon can also advertise location based services provided by the beacon infrastructure. Upon determining that the mobile device crossed the geofence defined by the beacon infrastructure. The application can monitor for beacon signals and continuously update its location to be the location of the beacon currently in proximity with the mobile device.

[00433] When the mobile device loses contact with the beacon for a defined period of time (e.g., 5,10 minutes) or when the mobile device exits the geofence defined by the beacon infrastructure, the application can transfer the monitoring back to the application subsystem, so that the location of the mobile device can be determined using Wi-Fi and or Cellular ID.

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[00434] In some implementations, the application can distinguish between beacons in the beacon infrastructure and mobile beacons that may be detected in a scan, such as other Bluetooth enabled mobile phones operating within the beacon infrastructure.

[00435] For example, each beacon in the beacon infrastructure can provide data in its broadcast signal that indicates that the beacon is part of a beacon infrastructure.

[00436] Alternatively, or in addition, when a mobile device makes first contact with a beacon in the beacon infrastructure, that beacon can transmit to the mobile device a list of unique identifiers (e.g. beacons ID) of other beacons in the beacon close infrastructure and other information about the beacon infrastructure, such as a name, geofence data, one or more websites associated with the beacon infrastructure.

[00437] Beacon infrastructure can be located in any geographic region, including businesses (e.g., shopping malls, retail stores, restaurants), landmarks (e.g., museums, airports, parks, entertainment venues) and any other environments where location based services are desired.

[00438] The available local advertising marketing is huge with over $150 billion in revenue in the US alone.

[00439] Indoor LBS Applications

[00440] This is a concept that offers a complete suite of application from finding parking to navigation of indoor malls\stores and with a capacity to navigate to emergency exits with a low cost to implement and with a business model that can be used to attract customers.

[00441] The application represents a big opportunity in the navigation market and will open up new avenues for companies from telephone operators to mall/store/department storeowners to navigation and mapping companies.

[00442] The disclosed technology presents a low cost and easily deployed infrastructure for local based navigation outdoors and indoors without the need for GPS and or cellular networks. Moreover, the concept is especially suitable for local area (indoor and outdoor) services when and where the GPS and the cellular network can't provide the solution and the accuracy needed to provide such navigation (1OM or less).

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[00443] The disclosed technology provides a system is based on existing Bluetooth, a technology that is proven to be stable, simple, inexpensive and mature in market use. Moreover, it is a common communication tool and is available on more than 85% of all new mobile phones.

[00444] System Architecture:

[00445] The infrastructure consists of RF Bluetooth beacons installed in known locations in a local area. The beacons will respond to Bluetooth device scanning inquiries made by "user's" Bluetooth enabled cellular phone or other Bluetooth device with a the special application.

[00446] Each of the RF beacon are ID that represent the Location ID as well as represent the facility/product type. A mobile device as well as any Bluetooth device (desktop, laptop, tablet and cars etc.) can become also a beacon providing a new echo system where an infrastructure can include static and dynamic deployments of beacons interact with each other's.

[00447] The local area map (mall map, store, building map, area map etc....) will be available to be downloaded as part of a mapping system that can be triggered to download at the entrance of the building/mall/area or the directory to provide the mapping for the navigation or as part of a mapping and navigation application.

[00448] A "user's" Bluetooth cellular phone will scan the local area for the location beacons. When a "user" is within 5/10 meters, the location beacons respond, providing room- level navigation accuracy. The beacon ID as well with signal strength will provides instant localization determination, with multiple beacons installed and possibly receiving more than one beacon's signal, a simple triangulation calculation and options for signal strength will determine the exact location of the "user" on the downloaded map of the local area. Note that there is no communication establish between the beacons and the mobile phone (no pairing), and that no connections to the Internet are necessary (even so to be provide with more information you may need Internet).

[00449] Other signals not on the list will be ignored, There is a mixed use of beacons and delivery option depending on the application (for example in a mall application, the stores can have a WAP or use the Internet to automatically deliver more content push to a "user's" mobile device where the beacons serve as navigation "antennae" as well as trigger mechanism to

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provides application exploit and waypoints contents to help the "user" navigate in the area. Application can be: Sales Sense-Next Generation Marketing Tools: the Behavioral Module, Nav4Parking,Nav4Realty, Nav4Mall, Nav4Sale, Nav4Museurn, Nav4Show, Nav4Train, Nav4Sign, Nav4Emergency, Return2Parking, Nav4Store, Nav4Conference, Nav4Disney, Nav4Events,

[00450] Moreover, according to research, indoor navigation may be more important than outdoor navigation and may represent a huge new market.

[00451] The technology disclosed herein enables shopping centers, malls, department stores, buildings, airports, train stations, exhibition centers, museums, and amusement parks to understand the way that their customers or passengers flow through their premises. At the same time it provides the user/shopper with unique indoor navigation capability without compromising user privacy.

[00452] The innovation disclosed herein enables, for the first time, the navigation and GPS industry to tap into the local advertising market, estimated to be $150 Billion in the US alone.

[00453] The technology disclosed herein provides a reliable method for identifying the path habits and the behavior that people take through an area.

[00454] There are a number of advantages to the technology disclosed herein, including:

Extremely large sample size as mobile penetration is above 90%

Shoppers remain anonymous accurate to within 5 m

Based on a Bluetooth technology

[00455] For retail areas, malls in particular, the advantages of understanding shopper behavior are significant. Such information can assist the mall to:

[00456] Evaluate and improve their retail tenancy mix by identifying which stores shoppers consider complementary. The device/cellular phone is the one that scans and tracks tags/beacons along the route, each scan includes the cell's unique Bluetooth ID, and while these ID'S help

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track the movement of the signal and its owner, they don't reveal the identity of the user. This is a more precise method than what Google maps uses to detect a general location on a mobile phone by cell towers which are accurate between 300-1000 meters compared to accuracy of the disclosed technology which is below 10 meters.

[00457] Some reports about shoppers show how valuable behavioral information actually is and the profit opportunities that come along with this:

[00458] Where they go, Where they go next, Where they do what, When they do what, who does what?

[00459] Understand behavioral patterns across demographics. Similarities, differences and much more.

[00460] Sales Sense User Preference Module

[00461] Every day millions of people access the Internet and enter their profile, personal information, or answer questions about their preferences in order to access a service/site, to get to a mall, identify underutilized areas in the mall, understand the impact of anchor stores on the incentives, coupons, specials, etc.... The sites use the information for marketing and in some cases, share or sell the information. Recent research has found that most people:

[00462] Measure the implications of particular promotions or center events

[00463] Assist with planning day-to-day mall operations

[00464] Provide add-ons for the shoppers

[00465] Provide shoppers with a "web" like shopping experience

[00466] Provide shoppers with incentive/advertising and automatic check-in method

[00467] Increase security

[00468] And in an emergency provide the shoppers with alarm and notification

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[00469] The disclosed technology is the only system known today that can gather information on shopper paths continuously and accurately using a RF Bluetooth or Wi-Fi beacon technology and all without compromising the shopper ID or his privacy.

[00470] The disclosed unique and innovative system and method which can also provide a way of surveying the behavior and preferences of the "user" shopper simply by observing the signals (Bluetooth beacon ID) associate with their mobile phones and at the same time provide the shopper with a unique special application for indoor navigation and local based service for the benefit of the shopper and the business owner.

[00471] The data collected using the technology can be used to provide trend reports showing which shops are most visited and at what times, whether there are sufficient public facilities to serve the visiting shoppers or whether more security staff are needed to name only a few of the potential benefits. Ultimately, the data made available by the disclosed invention helps shopping centers to become more in-tune with their customers so that they can create better, more pleasant places to visit by providing a loyalty and reward program.

[00472] Analytics provided by the disclosed applications can turn shopping center/department store/store into finely tuned sites, enabling mall/store owners to direct the flow of traffic efficiently around.

[00473] In contrast to alternative techniques, there is no device that tracks the user's cellular phone. In the disclosed method the user is willing to give information for incentives.

[00474] Using the profile and records, the surfing habits of the user (IP) is the way that all the search engine companies make money on the Internet. At the same time they try to direct the content to the user according to their profile/habits. But what about real life? People spend more and more time indoors (according to recent research, people spend more than 90% of their time indoors).

[00475] As part of the blue umbrella suite of location based services (LBS) application, the user's cellular phone will scan the area for the tags/beacons. For example-by being proximity close to the directory stand in a mall a decoding of the user key will be processed in order to allow the user ID and/or preference profile and provide the user with ads, specials, and

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incentives according to their profile "Your customer is telling you what they want, are you listening?"

[00476] The main idea behind this is to provide the user with pin-point content according to their desired preference at the location and also direct/navigate them to the desired location where they can find the store/sales/special/coupons or the information that they are looking for. At the same time there is also a benefit to the mall/store owner by getting the next generation's sales tools, getting costumers' habits and their sales profile, and able to serve better and accordingly the costumers.

[00477] The sales sense, user preference module is an add- on to the sales sense marketing where it joins the user behaviors module to create a very unique LBS business and marketing model the analysis of these spatiotemporal data can supply high level human behavior information valuable to urban planners, local businesses, and the Local Based Services (LBS) marketing.

[00478] Mall/department store/store indoor applications are part of nav4mall/store

[00479] The indoor applications and navigation takes a further step to give the user/shopper next generation shopping tools by providing them with the following indoor applications that are part of nav4mall/store.

[00480] Map and indoor Navigation-brings the local mall/ store map to the digital age, allowing the user to navigate from waypoints to waypoints on the map Directory- It brings the store/mall directory to the cellular phone. Search and Find-store/place/item products that are on the directory represent waypoints/tags/beacons on the loading maps.

[00481] Sales/specials-discounts, sales, and coupons, that can be added-on or a replacement for the mall/store flyer that provides the shoppers at points in the mall/store, it can even direct the user/ shopper to the aisle with the products and to coupons and directs the shoppers to what they looking for.

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[00482] Parking and return2parking- although not directly the same beacons (for the parking the infrastructure employs long range beacons where in a store/mall the beacons can be a shorter range). The disclosed service allows the user to find parking spaces and location of parked cars.

[00483] Info-the information part can provide information about events, restrooms, ATM locations, seating area, kids playground, fountain, public phones etc....

[00484] Emergency-A very important part of the disclosed innovation is the ability to provide the user with a unique alarm and notification to the user without depending on other communication links like cellular phones that are prone to failure in emergencies. The present invention provides the user with the building/mall/store/place emergency procedure and in emergency will help navigate the user to safety.

[00485] Panic-part of nav4emergency allows the user to request being located in an emergency.

[00486] Privacy: The system does not collect personal information such as name or phone number. It does, however, record the phone's Bluetooth identification number to build a profile of the user or the use of the phone in the area. It is like surfing the web where a "user's" IP address is recorded for future marketing statistics and surfing habits (with permission from the user). Also as part of the encoding key into the Bluetooth device (user profile) as described in the sale sense part the privacy and security increases to the level where viewing the key broadcast by the Bluetooth device can't reveal any user identity unless the user requests to be registered to get incentive, specials, sales, etc., even then his name or other personal information is secure and only the Bluetooth device key/ ID are recorded.

[00487] By directly targeting the consumer standing right outside or inside a business, an event, or walking toward a kiosk or restaurant, merchants can maximize their marketing budget while incorporating a new, inexpensive and effective form of advertising.

[00488] The "user" is in complete control. They can disable their Bluetooth application any time or just reject content, there is no "spam" effect and the "user" is attracted by incentives rather than generic promotions. In a mall-like environment a "user's" incentive to use the

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disclosed technology can be further enhanced with the use of the associated key advantages and packages.

[00489] Isn't this all a bit like "big brother"? Not at all, and it isn't even "little brother"! The system simply logs the movement of a cellular phone around an area and aggregates this to provide trend data for businesses. It's much less intrusive or invasive than existing methods that are already in widespread use-for instance CCTV cameras and number plate monitoring as they do collect personal information such as your image or car number plate. The disclosed technology represents the next generation shopping experience in shopping centers, malls or stores and fits very well with today's business model. Such a service can be offered for free to the "users" and backed by advertising and the use of the data by the stores. Such service and application and the ability to include the full "suite" of applications especially designed for shopping malls/stores and including the emergency part of it will also ease the fear of "locating" or any other privacy issue.

[00490] Who benefits from the disclosed technology? Everyone benefits from the trend data collected. The process enables a way to collect instant feedback from shoppers without having to bother them for information. In the old days centers would have used researchers to survey consumers but this information takes time to collate and response rates are very low these days as shoppers have increasingly become reluctant to stop and share their feedback. Hence the disclosed innovation provides a very effective method in the same way that TV networks know how many people watched particular programs and use that information to discern what programs to make and how to calculate the costs advertisers must pay to promote their products during different timeslots, the system provides the equivalent for shopping center owners and their resident retailers. It is believed that introducing the proposed system and marketing tools above can help users and merchants upgrade the real shopping experience of today with the advantage of the web like tools.

[00491] The disclosed innovation represents the next generation shopping experience in shopping centers and malls and fits very well within today's business model. Such a service can be offered for free to the "users" and backed by advertising and the use of the data by the stores.

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Such service and application and the ability to include, the emergency part of it will also ease the fear of "locating" or any privacy issue.

[00492] For the first time the shopper will experience Internet type marketing in the traditional sales and advertising venue.

[00493] Here are the benefits consumers could see from shopping center using the disclosed technology:

Better in-mall events-- the system can monitor how successful they were by monitoring the sheer volumes of people attending and for how long.

Provide shoppers with next generation sales tools: navigation in your mall store facility directly to the sales or specials that you want them to go to ....

Add-on to the store/mall directory and the in-store mall flyer.

Take the guessing from the customer's next want ...and then send them directly to the products, coupons, or specials they might want.

Improved public transport links-by monitoring how people traveled to a center. With the government's current emphasis on helping people to use public transport more effectively, having this kind of information can have a very positive, local environmental impact. Busy shopping centers can otherwise create large volumes of extra road traffic, also with the search4parking and return2parking application improves traffic, saving time and gas.

Eliminates congestion within the shopping center-- the disclosed innovation can help center management understand whether opening hours need to be extended or whether the center layout needs to be improved to avoid congestion.

Improves shopping center and public facilities efficiently- the disclosed innovation's data helps managers to understand which parts of their facility are very busy which means they know when to deploy extra employee/cleaners/security to ensure proper service.

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Better security--over-crowding also leaves shoppers vulnerable to pickpockets and other security risks. The disclosed system can identify congested areas and ensure security personnel are deployed appropriately. And in an emergency the disclosed system can provide instant alarm and notification even if the cellular communication or other system is not available.

Improved mix of stores and center layout-the system helps identify which stores are popular and which are not- making sure that the best possible layout and mix of shops is provided for visiting shoppers. If some shops are unpopular they can be switched for brands that customers actually want.

[00494] It is believed that shopping should be an enjoyable pastime. Who wants to go to shopping center that are congested, poorly laid out, have dirty toilets, are badly positioned for transport links and which pose a security threat to visitors? Altogether this makes for a much better shopping experience.

[00495] How do shopping center owners and retailers benefit? The benefits for shopping center owners of using the disclosed technology are huge and there are many possible uses for the information gathered. The disclosed applications can help shopping center owners get a better understanding of how people use their center such as the order of stores they visit and the time they spend in different areas of the center.

[00496] These days, visits to shopping malls are falling with increased competition from supermarkets, retail parks, and the Internet. With visit frequency going down it is critical that the shopper experience at the mall is exceptional and that is where the disclosed applications come in. The information can assists malls at all levels, from the very mundane to the more strategic questions that they face-such as whether or not they have the right mix of retailers across the mall.

[00497] Similarly it could help museums identify their most popular exhibits and help exhibition companies plan their venues more carefully around visitor traffic flows.

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[00498] The disclosed technology is able to provide a solution with quantitative feedback on whether the changes they make in the mall are successful. One of the ways to do this is by looking simply at how long shoppers tend to stay within a mall.

[00499] Don't retailers already measure shopper numbers? Yes they have infrared cameras and counting machines, which monitor and count the numbers of visitors to their stores. This measure is known as "footfall" and has been used by retailers for many years. The disclosed system provides another level of data by looking at the aggregate paths that mobile phone carrying visitors take and the length of time they spend-known as "dwell time".

[00500] In the past malls have focused solely on looking at the numbers of shoppers that they are drawing through the doors (footfall) but when combined with dwell time they can get a much more accurate predictor of their performance.

[00501] The system has no idea who the user is an individual. The system only looks at the path the user's phone takes. Essentially, it's like looking at a dot moving around a screen. In isolation this information isn't too interesting until you look at the wider patterns and trends and see lots of dots taking the same route or visiting the same areas of the mall.

[00502] What is the Bluetooth ID number? A Bluetooth ID is like the IP number in a computer network or the Internet which does not contain or reveal your phone number that the network operator uses to identify your phone. The system utilized the ID information as a key to find and detect the user.

[00503] The linkage between this identifier and your personal information is very critical to the business owner as it can provides a user habit preference profile and provides a new breed of tools to the business owner just by getting to know where the user is, and at the same time to provide the user with the best “VIP” like personalize shopping services.

[00504] The disclosed applications do not detect any personal information and have absolutely no idea who you are as an individual. Although the applications include an option for users to register as mall/store customers to provide more details about you (still no real ID), like a membership cards that will be provide the user with incentives, coupons, or special discounts if they participate. Moreover recent emergency events prove the need for emergency and

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notification to the "right people" at the "right time", by keeping the key/ID of the Bluetooth devices that are in the area/facility the disclosed nav4emergency can provide instant alarming and notification and navigation to the exit route and to safety all without revealing user ID or breaching privacy of the users.

[00505] The business model-Next Generation Marketing: The web advertising and the main focus of search engine success is based on technology that tracks the web user's habits and provides him with related ads according to his interests.

[00506] Using the disclosed infrastructure of a Bluetooth beacons, wherein the beacons are deployed about in a mall, store or shopping center environment. The disclosed invention represents a very unique ability to bring a web like shopping experience by its ability to keep up on the "user's" "surfing" or shopping habits in the shopping center, mall, or store. It will provide a better shopping experience (coupons, specials sales, according to the user's shop- ping habits) and service to the shopper.

[00507] Even though it may look like a privacy issue, the add-on services, the application, and the idea that it may save the user's life (nav4emergency application) combined with the fact that it does not reveal the person's name or telephone number, it is the same as the everyday use of surfing the Internet when the user's IP is recorded by the web sites and provides the basis for the "ad sense" or the web marketing tools, referred to as a "sale-sense".

[00508] It is believed that introducing the disclosed system and the associated marketing tools above can help the users and the sellers to upgrade the real shopping experience of today with the advantage of the web like tools.

[00509] The disclosed innovation represents the next generation shopping experience in shopping centers, malls and fits very well with today's business model. Such a service can be offered for free to the "users" and backed by advertising and the use of the data by the stores. Such service and application and the ability to include the emergency part of it will also ease the fear of "locating" or any privacy issue.

[00510] For the first time the shopper will experience Internet type marketing in the traditional sales and advertising venue.

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[00511] The disclosed innovation provides valuable solutions that enhance the effectiveness of ad campaigns. The ability to optimize performance in real time has a positive effect on advertiser satisfaction. The fact that this service is well integrated into the disclosed system is a tremendous advantage.

[00512] The disclosed innovation is a performance-enhancing technology, providing great data and allowing improved customer service.

[00513] It can be an extremely effective way to optimize the performance of offline/online advertising campaigns in the mall/store environment. For excellence in client services the idea is a clear win-win for everyone.

[00514] Helping to understand where users are going in the mall/store in real life and their buying behavior patterns will allow the merchants to continually adjust offers, placements and creative content to improve buy-through and maximize sales.

[00515] The disclosed technology will evolve mobile content into a bonfire revenue center that will benefit the shopping mall operator and merchants alike.

[00516] The "user" is in complete control. He can disable his Bluetooth application- any time or just reject content, there is no "spam" effect and the "user" is attracted by incentives rather than generic promotions. Probably the best technical analogy would be to compare the disclosed technology with existing web-based systems that measure viewers of web sites, for example Google Analytics.

[00517] For example, the Bluetooth beacon can broadcast an RF signal that includes its position coordinates (e.g., latitude, longitude), which can be detected by a mobile device. The position coordinates can provide a third location accuracy for the current location of the mobile device by virtue of the mobile device adopting the position coordinates of the beacon as its own position coordinates.

[00518] The known locations of a number of beacons in a geographic region (hereafter a “beacon infrastructure”) can define a geofence that encompasses the geographic region. In some implementations, the beacon can also advertise location based services provided by the beacon

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infrastructure. Upon determining that the mobile device crossed the geofence defined by the beacon infrastructure. The application can monitor for beacon signals and continuously update its location to be the location of the beacon currently in proximity with the mobile device.

[00519] When the mobile device loses contact with the beacon for a defined period of time (e.g., 5,10 minutes) or when the mobile device exits the geofence defined by the beacon infrastructure, the application can transfer the monitoring back to the application subsystem, so that the location of the mobile device can be determined using Wi-Fi and or Cellular ID.

[00520] In some implementations, the application can distinguish between beacons in the beacon infrastructure and mobile beacons that may be detected in a scan, such as other Bluetooth enabled mobile phones operating within the beacon infrastructure.

[00521] For example, each beacon in the beacon infrastructure can provide data in its broadcast signal that indicates that the beacon is part of a beacon infrastructure. Alternatively, or in addition, when a mobile device makes first contact with a beacon in the beacon infrastructure, that beacon can transmit to the mobile device a list of unique identifiers (e.g. beacons ID) of other beacons in the beacon close infrastructure and other information about the beacon infrastructure, such as a name, geofence data, one or more URLs to websites associated with the beacon infrastructure. Beacon infrastructure can be located in any geographic region, including businesses (e.g., shopping malls, retail stores, restaurants), landmarks (e.g., museums, airports, parks, entertainment venues) and any other environments where location based services are desired.

[00522] The system use and costs should scale well with its ability for multi-use in an emergency and in a non-emergency to provide local navigation on malls/store campuses, buildings, hospitals, hotels, malls etc.... using the Bluetooth beacon for navigation. Some of the key applications are:

[00523] NAV4Mall NAV4Store NAV4Sale or just University or Building Navigator, explore the indoor mall or inside a department store, navigate to the right place or the store or the department that you need. Navigate on the mall map/store mapping to find your way around all

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using your cellular phone or navigation system without a GPS. A new kind of service and new marketing way for the malls/store business owners, an add-on to local advertising.

[00524] With an indoor navigation based on the local map/ mall that will provide the user a navigation to his desired location in the mall/store and receives content according to his preferences or habits the user can be directed to a store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. The store will have also an option to deliver more content (advertising, sale, coupons, promo etc....) to the user when he approaches the store or already is inside via Bluetooth or Internet push to the user cellular Bluetooth enable. And in emergency-the nav4emergency will kick in, the nav4store mall module is the one that is described in more details in the patent application.

[00525] NAV4Museum NAV4Conference NAV4Show, explore museums or conference show exhibits in a new unique and easy way, find your way around when navigating on the floor map of the museum conference or the show, indoor navigation, navigate to exhibits restaurants, cafes, lavatories etc.... all to the "user" navigation or cellular phone. Any Museum Conference or show provided to the attended a mapping to the exhibits, some provide also additional audio device (headset) to get more information on the exhibits. The disclosed innovation will provide a unique indoor tools that will allow the attended to navigate the museum, conference or show in an easy way directly to his Bluetooth enabled cellular phone, when he reaches his desired exhibit he will be allowed to download directly to his cellular and or Bluetooth headset information about the exhibits. An indoor navigation to the exhibits as well to the restaurants, cafes, lavatories etc.... All to the "user" navigation or cellular phone and based on the facility map. And in emergency-the nav4emergency will kick in.

[00526] For all the users of mass transportation system the disclosed innovation will allow, locate, and point the "user" to the exact station or location on a route, an easy way to navigate in the train, subway, underground kind of system, a new way of "subway" or bus mapping in/out door and directly to the user's navigation or his cellular phone. Every day millions of people are using the mass transportation system, trains, sub- ways, buses, each of the passengers depend on the transportation map for the route information as well as schedules and additional services

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provided by the transportation system. Most of the passengers of today carry with them a cellular phone.

[00527] Such method can be used by the management of the transportation system, train, buses, taxi and road management where the RF beacons can be installed in any transportation facility or entity to provides traffic and even on-demand transportation request as well as on-line real time traffic and transportation "head count" of the mobile device exiting in the local area according to associate with a proximity beacons installed in the transportation entity of transportation infrastructure ether parking, traffic, sign, schedules and time to station and traffic – how many people at the station or bus stop or at area to create a need to taxi or public services as on-demand service.

[00528] Aside from such data gathering and the important of such statistically information to manage the flow of transportation in a local area where the beacon serve as "sensor" to detect the traffic in specific area to be monitored by collecting how many device are in that location and in event of emergency can provide emergency notification and alarming the local devices.

[00529] The method explained can be used to manage the transportation and provides automatic awareness into transportation managements and operators as well as the user on the road where he can automatically get information about traffic in his area generated from associates, his cellular id and/or the car Vin broadcasting method (a method where the car himself become an a long range RF beacon) and an RF beacon installed on the road – automatic traffic information that tracks the existence of the user in the area and proximity to a beacons installed in the road/transportation facility (even the traffic at intersection). infrastructure of wireless beacons to the benefit of transportation industry managements by providing automatic crowd sourcing data from the users along the road By delivering the beacons id they proximity to and have it statistically view as data guttering for events like traffic on the road automatically, adding such technology and infrastructure into the roads may take time so the use of the driver and passenger or the pedestrian cellular phone as a beacon and as automatic traffic notification can provide instant infrastructure- dynamic immediate deployment for the benefit of the transportation as well as the drivers in view of the driver and or the passenger and even the car

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can be set as a beacon and part of the automatic transportation system to alert for traffic and road safety and even for a car to car automatic notification of traffic and road information.

[00530] The disclosed innovation provides the passenger with the navigation inside the transportation system directly to the passenger's Bluetooth enabled phone; the passenger will know the exact location/station on the route as well as additional information on options like schedules. A new add-on service to the transportation providers as well to the passengers utilizes the disclosed indoor navigation method, and in an emergency-the nav4emergency will kick in.

[00531] The disclosed idea of implementing RF beacons alone the roads and in transportation facilities is designed to reduce the growing congestion on the roads and by providing a tools to provides intelligent transportation system, the implements of beacons can be part of a car, installed in red lights or in the road or in transportation facility, such system that installed in bus or subway or transportation entity n provides real time on line report if they empty or filled with travelers but just provide the automatic response from the user/car device associate with the RF beacons that will be installed in the bus/train the information will allow transportation control that can be done today only with installed high cost camera or sensors or depend on manually collect information from the users or GPS, and the GPS is not available indoor or provides an accurate information, in a simple way the user mobile phone automatically inform his "proximity" beacon ID, more of the same beacon ID reported meaning traffic or head count of cars/travelers etc.. in the transportation facility/entity area, in a way the method provides an "automatic waze" system, such system can even replace exiting sensors and provides the user as well of the transportation management with ability to know exactly where the bus/train/subway at a time, the data can be serve for schedule or on-demand public transportation, like sending bus/taxi to an area according to demand in the area. Such method can provide the user as add-on traffic and transportation information where he – the user play big part of it and it is not depend on manual transfer of information that some time proven to be not accurate enough. One application creates an echo system where the drivers of cars and the transportation entity are all integrated for an intelligent transportation system of tomorrow and all based on the same concept of infrastructure on RF beacons statics or dynamic in location where the user mobile phone as well as the car are integrated part of such system. Note that a mobile device as well as any Bluetooth device (desktop, laptop, tablet and cars etc.) can become also a beacon providing a

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new echo system where an infrastructure can be including static and dynamic deployments of beacons interact with each other's. Again, adding such technology and infrastructure into the roads may take time so the use of the driver and passenger or the pedestrian cellular phone as a beacon and as automatic traffic notification can provide instant infrastructure- dynamic immediate deployment for the benefit of the transportation as well as the drivers.

[00532] NAV4Theme Park -Theme and amusements Park navigation, navigate to your desire attractions as well with a new way for register to a "fast pass" kind off lane all in an easy way to the "user" cellular phone without the need for GPS Provides a new media and-on service. Ever wonder what it will be like to navigate inside the amusements park to the desired attraction, to know the schedules of the shows at the attractions and even to get your "fast pass" from a remote location instead of standing in line. All based on RF beacons that installed in the local attraction points and provides the triggering mechanism for guide navigation and the additional information about the ride/attraction. With the disclosed unique innovation, all can be become reality and directly to your cellular phone without the need for a GPS. It is understood that this technology can provide a new tool and service to the benefit of the amusements parks as well to the user.

[00533] Cellular next "Killer Application": Emerging technology markets are always on the lookout for that elusive "killer app"-the precious, irrefutable application that makes adopters stand up, take notice, and open their wallets. Once it's found, and as soon as adopters realize firsthand the value to be achieved, that killer application eventually expands into other, more advanced areas of adoption and innovation.

[00534] Hotel resort and cruise ship: A good example of use will be Nav4 Hotel Resort Cruise ship. The benefit of the proposed system and infrastructure of installed RF beacons in such places as cruise ships, hotels, resorts, and hospitality facilities to the business and to the guest.

[00535] The subject invention creates infrastructure of RF beacons in the facility, hotel, resort, and cruise ship areas to be integrated with the existing hospitality system and provide a trigger mechanism when the existence of the traveler/guest is detected.

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[00536] The association between the guest mobile phone or the hospitality employee mobile phone and the RF beacons ID will allow the example option below, as such there is two parts for the system to work, the infrastructure of the RF beacons installed in the local hotel, resort or cruise ship and the guest or employee mobile phone with the Bluetooth and or Wi-Fi and the application, note that the system can be work even without Internet and/or cellular communication and can utilize existing Wi-Fi system and local servers.

[00537] Example of some of the benefits and functionality to the hospitality system are:

Automatic check-in and interface to the front office system and billing folio

Link to key system or even replace the room key.

Recognize guest in-room, turn on Air condition and light – and turn off when the guest leaves the room to save electricity can be setup to automatic or manual.

Hotel resort cruise ship navigation.

Allow local messaging without Internet and or cellular communication based on local chat (especially fit to the cruise ships).

Allow push messaging to the guest by local services or by remote (when Internet is available).

Replace and ad-on to the guest in –room package of the area guide and deals and coupons.

Option of VIP services where the guest can be recognized automatically around the hotel, resort, and cruise ship for his profile preferences just by being in the area – providing personal treatment and services.

Room can be set to be open or close to clean according to guest or housekeeping existence.

Housekeeping management room status attended worksheet and productivity report.

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Increase security to the guest and to the hotel resort.

Allow the creation of profile preference of the guest companies group.

Provide check-in to a restaurant interface to a POS system bar system and menu selections.

Provide automatic ticketing and seat selection.

Guest loyalty, membership program incentive.

Increase security and provide add on to the security plan of the hotel, resort, and cruise ship to be part of the emergency evacuation and emergency procedure.

[00538] It is believed that the disclosed invention will meet the desire of hospitality service providers to increase their average revenue per user.

[00539] The main object of the present invention is to provide the indoor guide navigation and a special application for indoor use without the need for GPS communication.

[00540] It another object of the present invention to provide a method of providing special indoor application using an RF beacons Bluetooth and/or Wi-Fi and Bluetooth-enabled devices especially the cellular phone.

[00541] It is another object of the present invention to provide a method of special application for local business, mall/departments store or regular store, buildings, downtown centers and other facility area especially but not limited to indoors with a use of triggering application that uses the proximity ID of the detected beacons in the area.

[00542] It is another object of the present invention to provide a marketing model method especially but not limited for the LBS market.

[00543] It is another object of the present invention to provide a business model method especially but not limited for the LBS market.

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[00544] The foregoing and other objects of the present invention are achieved by providing an infrastructure of a Bluetooth beacons/tags installed in a known location in the area/facility, each tag/beacon has his own unique ID to ID the location in the area, the tags/beacons broadcast the ID to be pickup by the cellular Bluetooth mobile device.

[00545] An indoor mapping or mapping images of the area/facility will be part of the application and can be download before arriving to the area/ facility or trigger download at the area.

[00546] The application on the cellular phone/Bluetooth enabled device will scan the area/facility for the tags/beacons ID/name when a Bluetooth tag that matches the list responds to proximity detection and establishes a signal strength that may be calculated and when more than one beacon signal receives a simple triangulation can be done to find the current location. Other Bluetooth device not on the list will be filtered out.

[00547] The locating is established and will be displayed on the map. And because the location of the other tags/beacons is known navigation between the current location and a desired tag/beacons that represent waypoints are easy to achieve. In reality no communication is established at all between the tags/beacons and the cellular phone.

[00548] The disclosed innovation reverses the current idea of "locating" the user by letting the user navigate utilizing to the beacons of Bluetooth beacons (whose signal is sent by way points) directly to the user's mobile device. This will allow LBS (Local Base System) navigation, even indoors without GPS or Cellular network as well as triggering application and even link to existing system and software.

[00549] The RF beacons can reach from long distance depending on the application and the antenna used by the RF beacon (to get more accuracy less range and more beacons may needed so the 10 m is more than needed in building/room environment) getting more range to the "box" is as simple as attaching a bigger antenna or power buster to increase the signal.

[00550] The user is in a complete control, they have the choice to turn it on or off at any time.

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[00551] User can choose to be registered: membership privilege, student in a university, school, and business especially for receiving direct incentive specials coupons etc.... and for a full nav4emergency protection.

[00552] The disclosed applications let the user choose between participating and receiving incentives, specials, sales, coupons and local content tailor to the user preference, all for free, or they can choose not to participate and pay a small fee for the service and the software. In any case the user's privacy is still protected to the highest level compared to any normal daily use of the Internet ...!

[00553] There is also a great benefit to the user participating-they can have full emergency notification directly to their phone and in an emergency they can be directed by the emergency procedure in the area/building/mall/store and navigate to the exit route, even if the cellular network fails due to the high volume of traffic occurring in an emergency situation.

[00554] In the disclosed method, there is no detector or tracking for the user, the user themselves engage the scanning and detecting method to find the beacons in the area the user device with the proximity scan beacon providing the triggering mechanism.

[00555] Other than that, the proposed solutions create a full suite of applications for the benefit of the user, from parking to sales specials to indoor navigation, to be informed and notified in case of an emergency and directed to the exit route to safety.

[00556] The disclosed method can be attractive not only for shopping malls, department stores, or downtown strips but also to high-rise buildings, commercial buildings, universities, schools, museums, amusements parks, trains, subways, and hotels. It can also be attractive to search engines, advertising companies, cellular phone operators, manufactures, GPS companies, mapping, local businesses, local advertising, location based services (LBS), and the like. The disclosed method can give the LBS a new meaning-the business model that's made easy.

[00557] A facet of behavioral targeting has been around for a while but mostly on-line but it's been gaining traction among ad agencies retargeting program is now a key planning consideration for its advertisers.

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[00558] Why? The primary reason is because retargeting is a powerful means to bring lift to ad campaign results, generating higher conversion rates and lowering acquisition costs. You can't get much more effective than targeting a person who has shown interest in a product but didn't buy with a related ad that then gets him to buy, right? It generally fails to tap the unique opportunities of local advertising market estimates to be over $150 Billion in US alone . . ., Although people are spending more than 90% of their time indoor, there is no clear technology to provide indoor navigation and not clear business model, the advertisers, the business are disillusioned with the promise of location base services (LBS) but are still longing for a solution that properly addresses the significant audience represented by the explosion of cellular phones use and the availability of content.

[00559] It is understood that the disclosed innovation technology and business model can provide the next generation method for the LBS market to tap into the huge market opportunities.

[00560] The disclosed methods represent a very unique way of locating the exact location, in the method the user scans the area for a known list of beacons/tags, the user controls the scanning of the area for the known tags ID type, in reality there is no communication to be established at all between the user and the beacons (no pairing needed!), the user device scans the area for a known tags and the determination of the location done by beacon ID and signal strength to the proximity to the tag/beacon provides accuracy less than 5m.

[00561] Added to the navigation feature is the special indoor application design especially for indoor/store/mall shoppers from finding where the user parked his car to find/search of directory to an emergency alarming and notification.

[00562] Moreover this innovation is not depended on cell communication or Internet for the detection method as there is no need for central system nor expensive infrastructure, in fact the user device-cellular phone as well with the infrastructure tags/beacons have battery built in and can work even if the electricity is out, very important in emergency situations.

[00563] Moreover the sale sense marketing method comprising a unique way of delivering local content, advertising, coupons, special sales etc. pin point according to user ID and or profile preference that can be a record of behavioral activity and will provide simple and secure

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method for targeting user for LBS services and other services replacing like near field communication for marketing and even payments transactions.

[00564] The disclosed innovation provides a full line of indoor navigation application especially to places/area

[00565] An indoor navigation system may include a navigation computer, an arrival detection system. The navigation computer may be configured to receive a destination to which a user of the mobile navigation system wishes to travel and to provide guidance to the user about how to navigate to the destination. The arrival detection system may be configured to automatically detect when the mobile navigation system has arrived at the destination by being in a proximity to an RF beacon ID in the local area. The detection system is based on sense or scan of the existence of RF beacons installed in the local and be configured to wirelessly transmit automatically an arrival notice indicating when the user detects the existence of a proximity of a RF beacon and detects that the user has arrived at the destination in response to detection by the detection system of the arrival of the mobile navigation system at the destination.

[00566] The mobile navigation system may be part of a cellular telephone or any navigation device using a Bluetooth, part of the detection is a notification system is configured to wirelessly transmit the RF beacon ID of the proximity beacon and to associate the mobile ID of the user to determine the exact location of the user to provide for example: arrival notice to a representative of an airline. The arrival notice may be configured to cause the user to be checked into a flight of the airline.

[00567] The system may be configured to wirelessly transmit the arrival notice to a representative of a hotel. The arrival notice may be configured to cause the user to be checked into the hotel.

[00568] The system may be configured to wirelessly transmit the arrival notice to a representative of a food service.

[00569] The arrival notice may be configured to trigger the delivery of merchandise or a service to a vehicle in which the user is traveling. The arrival notice may include information about the location of the vehicle.

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[00570] The arrival notice may be configured to trigger promotional items to be delivered to the user relating to an establishment at or near the destination.

[00571] The system may be configured to wirelessly transmit the arrival notice to a representative of a conference that has been scheduled to take place at the destination.

[00572] The system may be configured to wirelessly transmit the arrival notice to multiple recipients. The multiple recipients may include attendees of a conference that has been scheduled to take place at the destination.

[00573] The system may be configured to wirelessly transmit the arrival notice to a social networking site in a fashion that causes notice of the arrival of the user to be published by the social networking site.

[00574] The system may be configured to ask the user for permission to transmit the arrival notice.

[00575] The system may be configured to automatically transmit the arrival notice upon detection by the arrival detection system of the arrival of the mobile navigation system at the destination.

[00576] At the time the navigation computer receives the destination to which the user wishes to travel, the system may be configured to ask the user whether the user wants the arrival notice to be transmitted in response to detection by the arrival detection system of the arrival of the mobile navigation system at the destination.

[00577] The system may include a global user setting which a user may set to automatically transmit or not transmit arrival notices in response to detection by the arrival detection system of the arrival of the mobile navigation system at destinations.

[00578] The system may be configured to ask the user to where it should transmit the arrival notice, to receive information indicative of this requested location from the user, and to transmit the arrival notice to this location.

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[00579] The system can create and utilize a network, which is referred to as dynamic deployment. The system will use the built-in Bluetooth protocol stack module that is able to simultaneously interconnect with other local devices, such as portable cellular phones in a "piconet", over the local area. The simultaneous connectivity limit of eight (8) devices at a time is overturned by the ability of creating a plurality of piconets which operate in a close proximity. It is understood that the Bluetooth enabled devices, such as portable cell phones, can rapidly move from one piconet to another. In fact, the Bluetooth devices need only remain a member of a piconet for the period of time required to complete one communication transaction. So the Bluetooth enabled devices can join and leave a local piconet frequently, effectively overcoming the eight (8) device limit. It is noted, even without the option to use a long range Bluetooth antenna, the configuration can effectively reach an unlimited distance.

[00580] The proposed invention provides an ability to form a wireless as hoc Bluetooth network or networks based on a collection of Bluetooth mobile devices that dynamically form a temporary network as long as these device are within a sufficient range (inside a room or a building, road store or a mall). The flexibility of the ad hoc network is what makes it a suitable choice for emergency deployment scenarios, where multiple devices would be deploy in a proximity area that is designated as an emergency to provide a new way of distributing emergency and alert information directly to those in the needed area.

[00581] Moreover, based upon normal human behavior, there is no need to inform everyone in a full room, or requiring all of the proximity devices participating in the network to be informed (for example in emergency). If only a few people within the occupied room are informed or receive the emergency information on their portable cell phone, they will convey the information to others located in the area..

[00582] The same method and idea is mimicked by the concept of dynamic deployment. The concept can be paralleled as a new way to deliver critical emergency alarming and notification without infrastructure in the localized area.

[00583] Moreover, the limitation of Bluetooth coverage can be overcome by utilizing the capabilities of the Bluetooth protocol in the methods described above. For example, in a very large conference location, the localized Bluetooth network (piconet) can join each other and form

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a larger network that covers the entire facility, which is much larger than the limited coverage of a single Bluetooth device. Portable cell phones located at one end of the facility can communicate with a second Bluetooth enabled device located at the opposite end, where the communication traffic is relayed by one or more intermediary, bridge devices. Any Bluetooth device, in our example Bluetooth enabled cellular phones, can become the bridge. The cellular phone owner does not need to know whether his/her device is a bridge, as the process is established and functions automatically as part of the Bluetooth protocol stack routine; in effect not changing any internal behavior of the Bluetooth.

[00584] And again, there is no need to reach all the people with an emergency or other message, as if the message were conveyed to only a few in a room, at least a portion of those would inform the remaining people of the emergency message.

[00585] Moreover, the present innovation will allow the user to use a "local instant emergency messaging system". The dynamic deployment configuration provides the ability for people to communicate with one another in the same local proximity using Bluetooth, where the people can chat and exchange important messaging for free exclusive of a need for a cellular network. Just think what it can be done in emergency or even in army deployment as other communication method.

[00586] From the old days in history, humans used messengers to deliver news and information. The disclosed invention uses applies these older concepts to a device that will make it easy to distribute and broadcast the information around, using the messengers as the mobile (emergency) notification, as referred to as dynamic deployment.

[00587] These, as well as other components, steps, features, objects, benefits, and advantages, will now become clear from a review of the following detailed description of illustrative embodiments, the accompanying drawings, and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

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[00588] The preferred embodiments of the invention will hereinafter be described in conjunction with the appended drawings provided to illustrate and not to limit the invention, in which:

[00589] FIG. 1 presents a schematic diagram representative of an infrastructure deploying a series of radio frequency(RF) wireless beacons;

[00590] FIG. 2 presents a schematic diagram representative of an indoor mapping system utilizing RF wireless beacons, wherein the diagram depicts an exemplary application within a shopping mall environment;

[00591] FIG. 3 presents a schematic diagram illustrating basic exemplary functions of an indoor mapping application as used on a mobile or cellular phone;

[00592] FIG. 4 presents an exemplary flow diagram representative of an indoor detection and navigation process;

[00593] FIG. 5 presents an exemplary series a gradient concentric circles indicative of a location;

[00594] FIG. 6 presents an exemplary flow diagram representative of a business based application utilizing a series of deployed RF beacons;

[00595] FIG. 7 presents an exemplary flow diagram representative of a marketing based application utilizing a series of deployed RF beacons, wherein the marketing based application utilizes a profile, preferences, and other information for sales and marketing purposes;

[00596] FIG. 8 presents an exemplary schematic diagram representative of a series of functions or applications associated with a series of deployed RF beacons, wherein the series of functions or applications are generally directed for use with an RF beacon infrastructure deployed within an indoor environment.

[00597] FIG. 9 presents an exemplary schematic diagram illustrating an infrastructure employing RF beacons deployed in the indoor environment;

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[00598] FIG. 10 presents an exemplary schematic diagram representative of a series of functions or applications associated with transportation and/or telematics applications, wherein the series of functions or applications are generally directed for use with a static and/or dynamic RF beacon infrastructure;

[00599] FIG. 11 presents an exemplary schematic diagram representative of a series of functions or applications associated with hospitality based applications, wherein the series of functions or applications are generally directed for use with hospitality related businesses and environments;

[00600] FIG. 12 presents an exemplary flow diagram representative of a next generation marketing tools employing RF beacon technology; and

[00601] FIG. 13 presents a schematic diagram illustrating an exemplary dynamic deployment of an RF based network for use in a variety of applications, including mobile to mobile communications, car to car communications, and emergency or local communications.

[00602] Like reference numerals refer to like parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[00603] In all the figures of the drawings, sub-features and integral parts that correspond to one another bear the same reference symbol.

[00604] Referring now to the drawings in detail and first particularly to FIGS. 1-13 thereof.

[00605] FIG. 1 presents an exemplary flowchart illustrating a use of RF beacons (102). The RF beacons can utilize at least one of Bluetooth and Wi-Fi signal protocols. The exemplary system utilizes a mobile cellular phone (101) to scan and detect a proximity of an installed beacon (102) in the most part for determining an indoor or outdoor location in a proximity to a known location of the installed beacon(102) and for initiating or triggering a notification of an existence to indoor and/or outdoor navigation and delivery of local content according to the

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determined location. The same method can be used by fix computers or portable computers (103), portable devices (104), pedestrians carrying a portable device (105)(such as a cellular phone), or a vehicle / car (106) that can be equipped with RF Bluetooth or Wi-Fi technology. It is noted that the static beacons (102) can be assisted by including other portable RF Bluetooth or Wi-Fi enabled devices within the network, thus creating a dynamic network. It is understood that a number of applications can be provided utilizing the infrastructure created by the series of deployed beacons. Additionally, the applications can utilize a precise location of the user, wherein the location is determined by information provided by beacons signals emitted from each of the deployed RF beacons (102).

[00606] FIG. 2 presents an exemplary use of the RF Bluetooth and/or Wi-Fi beacon infrastructure deployed in a mall environment. An indoor map (200) of the mall interior is downloaded and saved or installed on the cellular phone (101). The indoor map (200) includes building structure layout, business locations and descriptions, and known RF beacon (102) locations throughout the associated mall, building, or other facility. The RF beacons (102) can be deployed inside stores or at as any other Points of Interest (POI) located throughout or around the mall. Information associated with an RF beacon (102) located proximate the cellular phone (101) can be forwarded to the cellular phone (101) by the beacon signal. The associated information (109) can be displayed upon the cellular phone (101) as illustrated. A location of the beacon signal receiving device (such as a cellular phone (101)), can be determined based upon a close proximity to one or more of the RF beacons (102) of the series of deployed beacons, which create the infrastructure. The precise location of the receiving device (101) can be determined based upon an identified beacon ID and a signal strength from the detect beacon (102) or beacons (102). The precise location can then be displayed upon an indoor map (200), as shown in FIG. 9.

[00607] FIG. 3 presents an exemplary operational process completed by the cellular phone (101). The mobile device (101) activates an application program for indoor mapping of the facility, building, structure, and the like (200) and scans a local area for RF beacons (102) to determine the precise location (302) of the mobile phone (101). The location of the mobile phone (101) is determined done by scanning the infrastructure of RF beacons (102), wherein each beacon is installed in a known location within the structure, wherein the structure can be a mall,

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a building, any facility, or any other enclosed structure. The RF beacons (102) can be installed inside stores or at any specific Point of Information (POI), around the mall. The location of the cellular phone (101) can be determined by using information from any RF beacon (102) located in a close proximity to the cellular phone (101). The application would recognize the beacon ID embedded within a beacon signal emitted by the proximate beacon (102). The application would calculate the location of the cellular phone (101) by utilizing a signal strength of the emitted and received beacon signal. This process provides a solution for a user to determine their location exclusive of a global positioning system (GPS), access to the Internet, or any other bi-directional communication. The location of the cellular phone (101) is then displayed upon an indoor map (200) on a display on the cellular phone (101). Should the cellular phone (101) be located in a suitable area and comprise the ability to establish bi-directional communication, the cellular phone (101) can transmit a notification signal or message indicating that the cellular phone (101) is in a region proximate the RF beacon (102), such as by transmitting an "I am here" message to a predetermined recipient. This can provide an automatic check-in process, where the user "notifies" others of his local existence to the local area business to establish his local location. in turn, the system can forward local contents to the cellular phone (101), wherein the local contents would be information associated with the current position of the cellular device (101). The system can be enhanced to utilize a direction of travel of the cellular phone (101) and anticipate approaching beacons. The system would then determine and transmit information associated with RF beacons located along the current projected path of travel of the cellular phone (101).

[00608] FIG. 4 presents an exemplary flowchart illustrating an indoor detection and navigation procedure. A user of the mobile cellular phone (101) approaches a facility/area where the user can download the facility/area map (200) having a series of RF Bluetooth and/or Wi-Fi beacons (102) installed in known locations throughout the facility/area. The application installed on the cellular phone (101) will scan the area/facility for broadcasted beacon signals. Upon receiving a broadcast beacon signal, the application will determine if the received beacon signal is associated with any beacons included in the list of known beacons (102). If the signal is determined to be associated with any beacons included in the list of known beacons (102), then the application proceeds with a location determination process (303). The location of the user (cellular phone (101)) is determined to be in a proximity of the identified beacon (102)

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transmitting the received beacon signal. The location is refined by using a signal strength of the beacon signal of the identified beacon (102) enabling determination of a more precise indoor location of the cellular phone (101). The location is then identified and displayed on an associated indoor map (200). In a condition where the cellular phone (101) fails to receive a beacon signal, the cellular phone (101) continues to scan the area (107). An optional feature includes a step of transmitting a notification of existence upon identification of a location; essentially having the cellular phone (101) transmit a message stating "I am here" (304) to the local area as a way of automatically check-in and/or a method of notifying a system that the user is within a local region. For example, the system can notify a local area business that a user is within the vicinity. In another example, the system can convey local contents to the cellular phone (101) based upon receipt of the notification that the user is within the area. The system can provide the user with a navigation heading (305) to waypoints based upon the current location of the cellular phone (101). In yet another example, the system can transmit Points Of Interest (POI) to the cellular phone (101) as illustrated in FIG. 2.

[00609] FIG. 4 is a flowchart illustrating of the indoor detection and navigation procedure according to an embodiment of the present invention. Referring to FIG. 4, the user with mobile cellular phone (101) approach a facility/area where he can download the facility/ area map (200) with RF wireless Bluetooth and or Wi-Fi beacons (102) installed in the facility area in a known place. The user mobile cellular phone (101) application will scan the area/facility for the known list of the beacons (102), if beacons was found then a location determination process (303) where is location of the user is determine as proximity to the find and match beacon ID, being in a close proximity to a beacon and recognize the beacon ID as well as calculating the Signal strength from the detect beacons (102) allow determination of the precise location indoor and ability to show the location over the indoor mapping (200), scanning is continue if no beacons (407) was found, when found the location is display on the loaded map over the mobile cellular phone(101) or Bluetooth device (103-106), part of the detection is to notify of existence "I am her" (304) to the local area as a way of automatic check-in method where the user "notify" his local existence to the local area business to establish his local location (303) and receive local contents, according to his location a heading navigation(305) between Points Of Interest (POI) can be establish.

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[00610] FIG. 5 presents an exemplary RF beacon accuracy radius circle (501) that is utilized in at least two distinct manners: one manner is used for the application, and a second manner is used to identify when the user's cellular phone (101) enters and/or exits the area around and in a proximity to a beacon (102) of the series of beacons (102). The central circle (502) and inner circle (503) illustrate different radii from the respective beacon presenting an accuracy of the location of the cellular phone (101). The radius circle (501) would be placed as an overlay circle over a portion of the local indoor map (200). This displayed configuration would identify an accurate location of the cellular phone (101) respective to the proximity of the beacon signal received from the Bluetooth and or Wi-Fi RF beacon (102) installed in the vicinity of the cellular phone (101).

[00611] FIG. 6 presents an exemplary flow diagram of a business application utilizing the series of RF beacons (102) deployed throughout a facility, one or more buildings, a mall, a store, and the like. Each RF beacon (102) can be installed by the facility owner, a business owner (601), an advertising company, and the like. In one application, a business owner (601) would install an RF beacon(102) in their business. When the user of the cellular phone (101) approaches the RF beacon, the cellular phone (101) detects the beacon signal transmitted by beacon (102) in the proximity thereof. The cellular phone (101) receives the beacon signal and determines the identification of the beacon (102) associated with the received signal. Once the location and/or identity of beacon is known, the application initiates a procedure to obtain local content delivery (604) from the business and/or business owner. In one option, the system can provide business or local content (605) to the cellular phone (101). In a second option, the cellular phone (101) can transmit a signal that will directly or indirectly notify the business owner that the cellular phone (101) is located proximate a specific beacon (102), wherein the specific beacon (102) is associated with the business owner's store, located either proximate to or within the business owners store, and the like. In turn, the business owner can provide local content (605) to the cellular phone (101).

[00612] FIG. 7 presents a flow diagram illustrating an exemplary target marketing feature. The application uses a profile preference provided by the user's cellular phone (101) wherein the mobile device scans the local area and determines the location of the cellular phone (101) using information obtain from a beacon signal broadcasted by an RF beacon (102) and optionally

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utilizing a beacon identifier (302). The profile preference is associated with the user of the cellular phone (101). The profile preference is provided to the local business in conjunction with a notification that the cellular phone (101) is located in the proximity to the specific RF beacon (702). The process can filter information to determine local based services contents (704), wherein the local based services content (704) is based upon the profile preferences of the Local Based Services (LBS), and the user's behavior (703). The system can determine local based services content (704) such as deals, offers, coupons and specials, and the like, as well as store or business information, and provide the information accordingly to the user through the user's cellular phone (101).

[00613] FIG. 8 presents a series of Local Based Service (LBS) applications that can be utilized in conjunction with infrastructure provided by the series of deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. One application (Parking and Return to Parking (810)) provides a method for searching for available parking spaces and/or a process for assisting a user to return to the parking location of the user's car. The Parking and Return to Parking (810) application can provide parking information within a parking garage, in a mall parking area, for street parking, and the like, wherein the Parking and Return to Parking (810) provides the user with direct navigation to empty parking spots and/or to provide the user guidance to return to the location where the car was previously parked.

[00614] In another application (Nav realty (802)), information associated with real estate is provided to a user using RF beacons (102) installed at each real estate property. Each RF beacon (102) would provide local information about the associated real estate property and can include navigation information respective to the local area real estate directly to the user's cellular phone (101).

[00615] In yet another application Navmall/store (803), information can be provided to business operators and subsequently, business related information can be provided to the application user.

[00616] In yet another application, Navsale marketing (804), sales, specials, coupons and the like can be transmitted to the cellular phone (101) and/or the system can provide directions /

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navigation to the user to guide the user to areas displaying items associated with the sales, specials, coupons and the like.

[00617] In yet another application, Navmuseum, Navconference, Navshow 805, the RF beacons (102) would be installed in known locations within a museum, a conference center, and any other related location, whereby the RF beacons (102) directly or indirectly provide information and/or navigation associated with the location to the user of the application.

[00618] In yet another application, Navamusement (819), the RF beacons (102) would be installed in known locations about any amusement park, theme park, or other entertainment venue, whereby the RF beacons (102) directly or indirectly provide information and/or navigation associated with the venue to the user of the application. The application can be enhanced by including an optional feature to assist a user in reducing wait times for access to rides, events, shows, and the like.

[00619] In yet another application, Navemergency (818), the RF beacons (102) provide critical information and/or navigation to the user during an emergency event including instructions pertaining to an emergency procedure, an emergency evacuation map and directions for evacuating the facility to a safe location.

[00620] In yet another application, Transportation (810), the RF beacons (102) would be deployed in a subway, on a train, on a bus, and/or in any mass transit system. This infrastructure would provide the user with information directly to their cellular phone (101) from the deployed RF beacons (102) installed along the route. This gives the user a complete navigation on a map of the train/subway mass transit directly to the user's cellular phone (101). In an alternative mode of the Transportation Application (810), the RF beacons (102) can be deployed along a side of a road, a cellular phone (101) residing within a vehicle, integrated into a vehicle, and the like. When the cellular phone (101) is mobile, the cellular phone (101) provides wireless vehicle-to-vehicle communication. One optional feature of this application would be an inclusion of automatic traffic notifications, what can be referred to as automatic “waze”, whereby the cellular phone (101) can provide automatic traffic and road notifications. In an alternate embodiment, a Bluetooth device can be located within a vehicle (106) (as either a fixed or a portable device), on

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a driver (105), on a pedestrian, and the like. The cellular phone (101) can be included as an integral element in gathering traffic information.

[00621] In yet another application, Navsign (811), the RF beacons (102) can be installed along a roadway at locations either proximate traffic signs or at locations exclusive of traffic signs, but would be appropriate for conveying traffic related information to a driver. Each RF beacon (102) would be installed at a location enabling passing vehicles to receive beacon signals from the deployed series of RF beacons (102). The related infrastructure would provide a telematics system to the driver's cellular phone (102), a system integrated into a vehicle, and the like.

[00622] In yet another application, Indoor Navigation (808), the RF beacons (102) can be employed to provide an infrastructure enabling the application to determine a precise location of the receiving device. The application would additionally include a capability of providing navigation between various deployed RF beacons (102). This application provides a solution in areas where the global positioning system (GPS) is ineffective, such as indoors. The system also eliminates a need for bidirectional communication.

[00623] In yet another application, Nav Hotel, Resort, Cruise Ship (816), the RF beacons (102) can be deployed within a hospitality environment to provide an infrastructure enabling the application to determine a precise location of the receiving device within the hospitality environment or venue. Since most of the environments of the hospitality venues are located indoors, this application provides a solution in areas where the global positioning system (GPS) is ineffective.

[00624] In yet another application, Notification/Automatic Check-In (815), the cellular phone (101) is directed to automatically transmit an arrival message, which notifies a recipient that the cellular phone (101) has received a beacon signal from an RF beacon (102) within the infrastructure of beacons and that the cellular phone (101) is in proximity of the RF beacon (102). The application can additionally consider elements of the user's profile when determining whether to send the arrival message and/or what is included in the arrival message.

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[00625] In yet another application, Payments (814), a payment transaction method can utilize a location determined by the proximity of the cellular phone (101) to an RF beacon (102) of the series of RF beacons (102). The location, the identification of the RF beacon (102) and/or the user profile can be associated with the payment.

[00626] In yet another application, NAV Dating / Social Networking Link (812), a precise location of the cellular phone (101) is determined using information associated with the beacon signal. The location information is then utilized to assist the user in regards to social networking as well as indoor navigation.

[00627] In yet another application, Dynamic Deployment / Local Communication (813), the application establishes an ad hoc network between a series of mobile Bluetooth based RF beacons, such as Bluetooth transceivers of cellular phones (101) to provide local messaging between a message transmitting user and a message receiving user, wherein the message is conveyed through at least one intermediary Bluetooth RF beacon.

[00628] In yet another application, Nav Emergency (818) the RF beacons (102) provide navigation to the cellular phone (101) from the current location of the cellular phone (101) to an exit location using a predetermined optimal emergency exit route. The location and routing would be based upon the initial location, which is determined by a proximity to an RF beacon (102) of the localized RF beacon infrastructure. The application can additionally provide an emergency procedure and any other necessary notifications to the user through the user's cellular phone (101).

[00629] In yet another application, Scanning For Life (817), the cellular phone (101) converts into a beacon in a condition where two-direction communication networks are unavailable by either lack of installation or an outage. The beacon repetitiously transmits a beacon signal using at least one of cellular transmissions, Bluetooth transmissions, and Wi-Fi Transmissions. Search and rescue parties utilize a portable receiver to scan for and locate the Scanning for Life beacon signal. The beacon signal can optionally include embedded information associated with the cellular phone (101), which can include specific information associated with the user of the cellular phone (101).

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[00630] It is noted that the RF beacon infrastructure enables execution of the above-described application exclusive of cellular communications and/or access to the Internet.

[00631] FIG. 9 presents an exemplary indoor infrastructure of RF beacons (102), wherein the RF beacons (102) are installed in known locations throughout a local area. Each RF beacon (102) broadcasts at least one of a Bluetooth signal and a Wi-Fi signal. The RF beacons (102) enable an application to determine a precise location of the cellular phone(101) on a local map (200). Once the application determines the location of the cellular phone (101) respective to a proximate RF beacon (102), the application can utilize a user profile or profile preferences to obtain marketing information. The user profile or profile preferences can be used to filter information provided to the cellular phone (101). The application can provide information to a remote recipient using Application Information (API (901) triggering or initiating content delivery (604). When triggering content delivery (604), a 3rd party application (903) would respond to the transmission directed by the application by conveying or pushing local content or other associated information to the cellular phone (902). The bi-directional communication can be accomplished using cellular communication, an ad hoc network, an Internet based communication, and the like. In another embodiment, the remote recipient can include a local business owner, thus notifying the business owner that the specific cellular phone (101) is in a vicinity of the business.

[00632] FIG. 10 presents a series of transportation based applications that can be utilized in conjunction with infrastructure provided by the series of fixed or dynamically deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. A portion of the applications introduce telematics therewith.

[00633] One application (Automatic Traffic Alert (1103)) provides beacon signals comprising telematics including traffic alerts.

[00634] In a second application (Dynamic Deployment (1104)), an ad hoc network is created between vehicles providing vehicle to vehicle communication using an intermediary communication link. The vehicle to vehicle communication is preferably accomplished using a Bluetooth protocol.

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[00635] In another application (Find Parking and Return to Parking (1105)), the RF beacon infrastructure is used to inform a user of available parking locations and/or provide navigation guiding the user to the location where the user parked their vehicle.

[00636] In yet another application (Automatic Traffic Alert (1103)), a driver (105) can employ their cellular phone (101) to deliver automatic traffic information (1103).

[00637] In yet another application (Trigger Application (1102)), the system identifies an RF beacon, which subsequently triggers or initiates an application.

[00638] In yet another application (Local Tracking (1106)), the system utilizes a Bluetooth beacon that can recognize the car/driver ID and subsequently track the car/driver.

[00639] In yet another application (Access Control (1107)), recognition of either a proximate RF beacon or an approaching cellular phone (102) causes activation of a device. This can be accomplished using any of many suitable processes. For example, when a vehicle is approaching a gate, the vehicle would receive a beacon signal from a local beacon. The signal would be deciphered to determine the identity of the beacon. Once known, the system would act according a directive that is associated with the proximate beacon identity. In one example, the system would transmit a signal to open a gate when the vehicle approaches the gate.

[00640] In yet another application (Theft Prevention (1109)), the RF beacon (102) would recognize the vehicle and prevent theft.

[00641] In yet another application (Automatic Payment (1114)), the cellular phone (101), an RF beacon device integrated into a vehicle, and the like, broadcasts a beacon signal comprising a beacon identifier, wherein the beacon identifier is used in conjunction with an automatic payment method.

[00642] In yet another application (Transportation Management (1110)), the RF beacons provide assistance for management of transportation systems.

[00643] In yet another application (Accident Prevention (1111)), the RF beacons provide assistance for prevention of accidents, such as by notification to a user when two RF beacons become too close to one another.

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[00644] In yet another application (Saving Fuel (1114)), the application or series of applications can reduce fuel consumption by optimize navigation, reducing time finding parking spots, provide telematics associated with traffic, provide management support of transportation systems, and the like.

[00645] In yet another application (GPS Add-On Navigation (1113)), the series of RF beacons (102) can be used to determine a location of a receiving device and can additionally be used to obtain navigation. This is particularly beneficial in areas where the global positioning system (GPS) is ineffective (such as indoors).

[00646] In yet another application (Nav Sign (1112)), the RF beacons can convey information associated with road signs.

[00647] FIG. 11 presents a series of navigation based applications that can be utilized in conjunction with infrastructure provided by the series of deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. Each RF beacon (102) contains and broadcasts a beacon signal comprising a beacon identifier to enable a receiving device to determine a precise location of the device within a facility, a mall, a show, a store, and the like. The RF beacons would broadcast a beacon signal using at least one of Bluetooth and Wi-Fi protocol. At least a portion of the RF beacons (102) can be associated with a Waypoint.

[00648] Each of the series of exemplary applications provides a location determining solution and navigation in an environment that is not conducive for the global positioning system (GPS), such as within a mall, a store, a parking garage, and any other indoor location.

[00649] One application (Parking and Return to Parking (1510)), the RF beacons (102) are deployed in a parking area. Each RF beacon (102) includes at least one sensor to determine a presence of a vehicle in the associated parking spot. The RF beacons (102) identify vacant parking spots and provide navigation to each vacant parking spot to a user. The application can additionally or alternatively provide navigation directing the user to the parking spot containing their vehicle.

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[00650] In a second application (Stores Directory (1520)), a directory of merchants is provided to the cellular phone (101). The directory can include displaying locations of the merchants on a local map (200).

[00651] In another application (Search and Find (1111)), the RF beacon infrastructure is used to provide directions or navigation between known waypoints within an indoor facility, such as a mall. The known waypoints would be displayed upon the indoor map (200).

[00652] In yet another application (Sales, Deals, and Specials (1540)), the network provides information pertaining to sales, deals, specials, and the like to the receiving device. The sales, deals, specials, and the like can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102).

[00653] In yet another application (Entertainment (1530)), the network provides information pertaining to entertainment to the receiving device. The entertainment can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102). The application can additionally provide navigation to a location associated with the entertainment.

[00654] In yet another application (Information and Events (1590)), the network provides information pertaining to entertainment to the receiving device. The entertainment can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102). The application can additionally provide navigation to a location associated with the entertainment.

[00655] In yet another application (Dining (1580)), the network provides information pertaining to dining in the local area to the receiving device. The dining information can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102). The application can additionally provide navigation to a dining location.

[00656] In yet another application (Emergency (1560)), the network provides a notification of an emergency situation, emergency procedural information, and navigation from the current

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location, through the structure, and to a predetermined exit location. The information would be respective to the proximate RF beacon (102).

[00657] FIG. 12 presents an exemplary flow diagram illustrating a next generation of marketing tools utilizing the RF beacon (102) infrastructure deployed in a local area. The network obtains a user's profile or preferences (701) as well as a user's behavioral pattern (704) associated with the user's cellular phone (101). The information is conveyed to a business owner (702) for marketing purposes. The profile and/or preferences are filtered to determine applicable local based services (LBS) (703). The information can trigger or initiate an application (304), establish a link to an existing system and software, and the like to provide at least one of local content (503) and indoor navigation (108) to the cellular phone (101) or similar receiving device.

[00658] FIG. 13 presents an exemplary schematic diagram illustrating a method of utilizing dynamic deployment to create an ad hoc network. Exemplary applications include vehicle-to-vehicle communication, emergency communication, local communication, and the like. The method establishes communication between a series of Bluetooth devices located proximate one another. One exemplary implementation employs cellular phones (101), utilizing the Bluetooth transceivers integrated therewith. The dynamic network is created by placing proximally located Bluetooth devices into an ad hoc or mesh network. The network is based upon overlapping signal transmission radii. The network can include installed and/or mobile Bluetooth devices, exclusive of cellular or other higher powered and costly communication interfaces. The method can be utilized in transportation creating a road size networking of vehicles and/or drivers for telematics or traffic information, a push alert providing road information, and creating a vehicle-to-vehicle communication capability. In another option, the network can be utilized in an emergency situation, more specifically, when and where the cellular network are unavailable, interrupted, down, or fail. The ad hoc network creates a longer range communication capability utilizing local low power Bluetooth and/or Wi-Fi devices to convey information to local emergency responders or other parties. Another optional feature of the dynamic deployment enables creation of an ad hoc network within a structure, a mall, a store, a building, an office, an entertainment complex, and the like, exclusive of cellular communication. The ad hoc network provides capability for local messaging between users in a proximity area. The network can be utilized to deliver local content to the cellular phone (101) exclusive of any broader and higher powered

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communication networks, such as cellular, and the like. The network would be applicable between cellular phones (101) vehicles comprising the appropriate transceiver technology (106), within a facility/building/area, and the like.

Google Ex. 1029, p. 324

Electronic Patent Application Fee Transmittal

Application Number:	14285273
Filing Date:	22-May-2014
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Filer:	Allen D. Hertz
Attorney Docket Number:	MEN-14-002

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	2202	15	40	600
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	100	100
Miscellaneous:				
		Total in USD ($)		**700**

Electronic Acknowledgement Receipt

EFS ID:	22970699
Application Number:	14285273
International Application Number:	
Confirmation Number:	9122
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Customer Number:	31877
Filer:	Allen D. Hertz
Filer Authorized By:	
Attorney Docket Number:	MEN-14-002
Receipt Date:	20-JUL-2015
Filing Date:	22-MAY-2014
Time Stamp:	22:24:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$700
RAM confirmation Number	7445
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		00_MEN-14-002_Mendelson_Mapping_NFOA_032015_Reply_072015_Comp.pdf	1392104 c5884a8a648ad8d9cbdaf6864307460e3c580593	yes	285

Multipart Description/PDF files in .zip description

Document Description	Start	End
Extension of Time	1	1
Amendment/Req. Reconsideration-After Non-Final Reject	2	7
Claims	8	21
Applicant Arguments/Remarks Made in an Amendment	22	74
Specification	75	180
Specification	181	285

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	32328 67f1c312a654397f444a5b07b8db63f51623454e	no	2

Warnings:

Information:

Total Files Size (in bytes):	1424432

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/22 (03-13)
Approved for use through 7/31/2015. OMB 0651-0031
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): MEN-14-002

Application Number: 14/285,273 | Filed: May 22, 2014

For: INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

Art Unit: 2642 | Examiner: Nghi H. LY

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☑ One month (37 CFR 1.17(a)(1))	$200	$100	$50	$ 100
☐ Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☐ Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$
☐ Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐ Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☑ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 506583.

☑ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 50,942.

☐ attorney or agent acting under 37 CFR 1.34. Registration number .

Signature	July 20, 2015 (Date)
Allen D. Hertz (Typed or printed name)	561-716-3915 (Telephone Number)

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/285,273	Filing Date 05/22/2014	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	21 minus 20 =	* 1	x $40 =	**40**
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	* 0	x $210 =	**0**
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**40**

APPLICATION AS AMENDED – PART II

AMENDMENT **07/20/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 36	Minus	** 21	= 15	x $40 =	600
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	x $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	**600**

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/GLENN BURNS JR/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/285,273	05/22/2014	Ehud Mendelson	MEN-14-002	9122

31877 7590 03/20/2015

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BOCA RATON, FL 33428

EXAMINER	
LY, NGHI H	

ART UNIT	PAPER NUMBER
2642	

MAIL DATE	DELIVERY MODE
03/20/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/285,273	Applicant(s) MENDELSON, EHUD	
	Examiner NGHI H. LY	Art Unit 2642	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05/22/2014*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-21* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-7 and 9-21* is/are rejected.

8)☒ Claim(s) *8* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *05/22/2014* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Claim Objections

1. Claim 14 is objected to because of the following informalities:

A comma (,) should be added as follow: "receiving at least one of the beacon signal by the mobile device, decoding the received beacon signal,". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

3. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-4 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A).

Regarding claim 1, Simons teaches a method of mapping a localized area comprising an interior of at least one enclosed structure, the method comprising steps of: deploying a series of beacons about the localized area comprising at least one enclosed structure (Abstract, "beacons 30, 32, 33", and [0016], "several beacons located a few meters apart", also see [0002], [0016], [0020], [0041] and [0051], see "*shopping mall", "airport", "shop" restaurant", "hotel", "internet cafs, museums and other places of public interest and commerce*", and see [0012] and [0013], "*wall*"), wherein at least a portion of the series of beacons are located to transmit within an interior of the at least one enclosed structure (Abstract, "beacons 30, 32, 33", and [0016], "several beacons located a few meters apart", also see [0002], [0016], [0020], [0041] and [0051], see "*shopping mall", "airport", "shop" restaurant", "hotel", "internet cafs, museums and other places of public interest and commerce*", and see [0012] and [0013], "*wall*"), broadcasting a beacon signal from each beacon of the series of beacons (see Abstract, [0005] *to* [0018], "beacons" and "broadcast"), determining a location of a mobile device

in accordance with following steps: scanning for any of the beacon signals using a mobile device, detecting at least one of the broadcast beacon signals (see Abstract, [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "position", "zone", "range", "broadcast"), receiving at least one of the beacon signal by the mobile device (see Abstract, [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "broadcast"), wherein the beacon signal is broadcast from a beacon of the series of beacons located proximate the mobile device (see Abstract, [0006], [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "beacon, "position", "zone", "range", "broadcast", "proximity"), and determining a current location of the mobile device within the interior of an enclosed structure of the at least one enclosed structure (see Abstract, [0006], [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "beacon, "position", "zone", "range", "broadcast", "proximity", and see fig.1, **range** 12, [0034], see "*the CA terminal 14 is just within the broadcast **range** 12, and therefore the user may receive unsolicited or pushed **service offers**, **adverts** and **the like** on their CA terminal 14 from the beacon 10*", also see [0002], [0016], [0020], [0041] and [0051], see "*shopping mall", "airport", "shop" restaurant", "hotel", "internet cafs, museums and other places of public interest and commerce*"), wherein the current location of the mobile device is determined based upon information collected from the received beacon signal (see Abstract, [0006], [0008] to [0022], [0035], [0036], [0038], [0039], [0041], [0042], [0046], "beacon, "position", "zone", "range", "broadcast", "proximity", and see fig.1, **range** 12, [0034], see "*the CA terminal 14 is just within the broadcast **range** 12, and therefore the user may receive unsolicited or pushed **service***

offers*, *adverts* *and* *the like *on their CA terminal 14 from the beacon 10*", also see [0002], [0016], [0020], [0041] and [0051], see "*shopping mall", "airport", "shop" restaurant", "hotel", "internet cafs, museums and other places of public interest and commerce*"), determining an indoor map associated with the localized area (see [0041], "shopping mall… provide…map"), displaying the localized area indoor map (see [0041], "shopping mall…provide…map").

Simons does not specifically disclose displaying the current location of the mobile device on the localized area indoor map.

Yamazaki teaches displaying the current location of the mobile device on the localized area indoor map (see Basic-Abstract, "*User terminal receives this information based on which the current position of user and route to destination are displayed on indoor map*").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Yamazaki into the system of Simons in order to make the reaching of the destination easier without fear of moving in a wrong path (also see Yamazaki, Basic-Abstract).

Regarding claim 2, Simons teaches the beacon signal is a short range radio frequency being at least one of a Bluetooth signal and a Wi-Fi signal, the method further comprising a step of: transmitting the beacon signal as at least one of the Bluetooth signal and the Wi-Fi signal (see [0033], [0038], [0046], [0047] and [0048], "*Bluetooth*", "*IEEE*").

Regarding claim 3, Simons teaches utilizing beacon signals from the series of

beacons to aid in navigation to the mobile device, when the mobile device is located within an interior of a structure where a global positioning system (GPS) is ineffective (see [0002], [0016], [0020], [0041] and [0051], see "*shopping mall", "airport", "shop" restaurant", "hotel", "internet cafs, museums and other places of public interest and commerce*". In addition, see the teaching of Wrappe, [0044] and [0046], in claim 20 below, "*where GPS signal blockage severely degrades*").

Regarding claim 4, Simons teaches the step of determining the current location of the mobile device is accomplished by utilizing a signal strength of the received beacon signal (see fig.1, range 12, and see [0009], "*range dependent upon the power of the beacon*". In this case, if the power of the beacon is strong, a geographic location proximate the beacon is closer, on the other hand, if the power of the beacon is weak, a geographic location proximate the beacon is faraway. **In addition, see claims 5 and 17 below, where Gwon teaches "*determining the current location of the mobile device is accomplished by utilizing a signal strength of the received beacon signal*").**

6. Claim 5 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Gwon (US 2002/0131386A1).

Regarding claim 5, the combination of Simons and Yamazaki teaches claim 1. The combination of Simons and Yamazaki does not specifically disclose the step of determining the current location of the mobile device is accomplished by utilizing

triangulation and at least two received beacon signals from at least two beacons.

Gwon teaches the step of determining the current location of the mobile device is accomplished by utilizing triangulation and at least two received beacon signals from at least two beacons (see [0076], "*If a number of BTS cells are present such that the mobile node is receiving beacon signal**s*** *from at least three BTS', conventional triangulation techniques based on relative beacon signal **strength** measurements can be used to determine the mobile node's distance from each BTS. Another way is to use GPS*").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Gwon into the system of Simons and Yamazaki in order to enable fast route pre-establishment and reduced packet latency, and for optimizing quality of service by facilitating selection of best base station transceiver in overlapping cell environments, among other applications (see Gwon, Abstract)

7. Claim 6 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Carter (US 2002/0129138A1).

Regarding claim 6, the combination of Simons and Yamazaki teaches claim 1. The combination of Simons and Yamazaki does not specifically disclose the localized area indoor map is a floor plan image of the localized area.

Carter teaches the localized area indoor map is a floor plan image of the localized area (see [0009], [0010], [0011] and [0032]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Carter into the system of Simons and Yamazaki in order to allow relative data points to be collected (also see Carter, [0032]).

8. Claim 7 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Yasukawa et al (US 2004/0066917A1).

Regarding claim 7, the combination of Simons and Yamazaki teaches claim 1. The combination of Simons and Yamazaki does not specifically disclose the localized area indoor map is an indoor image of the localized area.

Yasukawa the localized area indoor map is an indoor image of the localized area (see [0043], "*…map information including images taken from various angles of the inside of the house*").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Yasukawa into the system of Simons and Yamazaki in order to provide a robot suitable for reporting emergencies (see Yasukawa, [0010]).

9. Claim 9 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Maeda et al (US 7,743,337).

Regarding claim 9, the combination of Simons and Yamazaki teaches indoor map (see Simons, [0041]). The combination of Simons and Yamazaki does not specifically disclose overlaying a series a gradient concentric circles onto the localized area indoor map, wherein the series a gradient concentric circles provide a distance relationship between the mobile device and a secondary object.

Maeda teaches overlaying a series a gradient concentric circles onto the localized area indoor map, wherein the series a gradient concentric circles provide a distance relationship between the mobile device and a secondary object (see fig.2B, 3, 4 and 5, and see column 3, lines 7-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Maeda into the system of Simons and Yamazaki, as a result, it is possible to know an approximate geographical distance to a destination intuitively and easily in the electronic map apparatus which is typically used for car navigation (see Maeda, Abstract).

10. Claims 10 and 11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Wrappe (US 2008/0280624).

Regarding claim 10, the combination of Simons and Yamazaki teaches indoor map (see Simons, [0041], "… *may be used in places like shopping malls to provide location-specific information such as* ***local maps****, information on nearby* ***shops and restaurants*** *and so on, with a beacon downloading information keys to a mobile device*", and/or see Yamazaki, Basic-Abstract, "*User terminal receives this information based on which the current position of user and route to destination are displayed on indoor map*"). The combination of Simons and Yamazaki does not specifically disclose displaying each point of interest (POA) associated a beacon identifier determined from the beacon signal on the localized area indoor map.

Wrappe teaches displaying each point of interest (POA) associated a beacon identifier determined from the beacon signal on the localized area indoor map (see [0013], [0033] and [0052], "*data* ***identify*** *the site, e.g., unique ID of the transmitter, identification*". Also see [0013], "*placing one or more beacon stations within a site*", also see [0013], [0052], "*when a mobile station is identified to be entering (or exiting) the site, the* ***commercial information*** *(e.g.,* ***electronic coupon, a web page of advertisement****) is automatically transmitted to the mobile station* ***for display***", also see [0046], "*stores and shops*", "*whether or not the mobile station is in a store can be determined from a map of the building*").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Wrappe into the system of Simons and Yamazaki in order to provide low cost electronic components can be used

for short range wireless data communication in accordance with wireless communication standards (see Wrappe, [0028]).

Regarding claim 11, the combination of Simons, Yamazaki and Wrappe further teaches displaying each point of interest (POA) associated a beacon identifier determined from the beacon signal on the localized area indoor map (see Simons, [0041], "… *may be used in places like shopping malls to provide location-specific information such as* ***local maps****, information on nearby* ***shops and restaurants*** *and so on, with a beacon downloading information keys to a mobile device*", and/or see Yamazaki, Basic-Abstract, "*User terminal receives this information based on which the current position of user and route to destination are displayed on indoor map*"), selecting a beacon location from each displayed beacon location on the localized area indoor map, obtaining information associated with each the point of interest (POA), and displaying the information associated with each the point of interest (POA) (see Wrappe, [0013], [0033] and [0052], "*data identify the site, e.g., unique ID of the transmitter, identification*". Also see [0013], "*placing one or more beacon stations within a site*", also see [0013], [0052], "*when a mobile station is identified to be entering (or exiting) the site, the* ***commercial information*** *(e.g.,* ***electronic coupon, a web page of advertisement****) is automatically transmitted to the mobile station* ***for display***").

11. Claim 12 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Wrappe (US 2008/0280624) and McCall et al (US 6,738,628).

Regarding 12, the combination of Simons and Yamazaki teaches scanning for any of the beacon signals using a mobile device (see Simons, [0034], see "*the CA terminal 14 is just within the broadcast range 12, and therefore the user may **receive** unsolicited or pushed service offers, adverts and the like on their CA terminal 14 from the beacon 10*". Note that, in order to "receive", the terminal 14 must "scan" for the signal), detecting at least one of the broadcast beacon signals (see Simons, [0034], see "*the CA terminal 14 is just within the broadcast range 12, and therefore the user may **receive** unsolicited or pushed service offers, adverts and the like on their CA terminal 14 from the beacon 10*". Note that, in order to "receive", the terminal 14 must "detect" for the signal), receiving at least one of the beacon signal by the mobile device (see Simons, [0034], see "*the CA terminal 14 is just within the broadcast range 12, and therefore the user may **receive** unsolicited or pushed service offers, adverts and the like on their CA terminal 14 from the beacon 10*". Note that, in order to "receive", the terminal 14 must "scan" for the signal),

The combination of Simons and Yamazaki does not specifically disclose customizing each beacon signal by embedding a beacon identifier within the beacon signal, wherein the beacon identifier distinguishes the beacon from the series of beacons, broadcasting the respective beacon signal comprising the embedded beacon identifier from each beacon of the series of beacons, initiating a process for obtaining marketing information associated with the beacon identifier from a remote information provider, obtaining the marketing information associated with the beacon identifier from

the remote information provider, and displaying the obtained marketing information associated with the beacon identifier on the mobile device.

Wrappe teaches customizing each beacon signal by embedding a beacon identifier within the beacon signal (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID, identification"), wherein the beacon identifier distinguishes the beacon from the series of beacons (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID of the transmitter, identification"), broadcasting the respective beacon signal comprising the embedded beacon identifier from each beacon of the series of beacons (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID of the transmitter, identification". Also see [0013], "*placing one or more beacon stations within a site*"), initiating a process for obtaining marketing information associated with the beacon identifier from a remote information provider (also see [0013], "*commercial information of the site*"), obtaining the marketing information associated with the beacon identifier from the remote information provider (also see [0013] and [0052], "*commercial information of the site*"), and displaying the obtained marketing information associated with the beacon identifier on the mobile device (also see [0052], "*when a mobile station is identified to be entering (or exiting) the site, the* ***commercial information*** *(e.g.,* ***electronic coupon, a web page of advertisement***) *is automatically transmitted to the mobile station* ***for display***").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Wrappe into the system of Simons and Yamazaki in order to provide low cost electronic components can be used

for short range wireless data communication in accordance with wireless communication standards (see Wrappe, [0028]).

The combination of Simons, Yamazaki and Wrappe does not specially disclose decoding the received beacon signal to determine the beacon identifier, transmitting a request for marketing information associated with the beacon identifier from the remote information provider.

McCall teaches decoding the received beacon signal to determine the beacon identifier (see column 4, lines 26-45, "*If a signal is received from more than one beacon, then each of the signals is decoded to determine the beacon ID*"), transmitting a request for marketing information associated with the beacon identifier from the remote information provider (see column 4, lines 26-45, "*request", "beacon ID*").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of McCall into the system of Simons, Yamazaki and Wrappe in order to automatically updates location information in a manner that needs no user intervention and is transparent to the overall management system (see McMcall, column 2, lines 43-47).

12. Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Yamazaki (JP 09126804 A) and further in view of Welch et al (US 5,319,363).

Regarding claim 13, the combination of Simons and Yamazaki teaches determining a floor of the at least one enclosed structure on which the beacon signal is

associated with (see Simons, [0010], [0015], [0035] and [0036], "floor"), identifying an associated floor map portion of a series of floor map portions of the localized area indoor map (see Carter, [0009], [0010], [0011] and [0032]), wherein the associated floor map portion represents the floor associated with the beacon signal (see Simons, [0010], [0015], [0035] and [0036], "beacon", "floor", [0041], "beacon", "shopping mall… provide …map"). The combination of Simons and Yamazaki does not specifically disclose displaying the associated floor map portion of the localized area indoor map, displaying the current location of the mobile device on the associated floor map portion of the localized area indoor map.

Welch teaches displaying the associated floor map portion of the localized area indoor map (see column 3, lines 20-23, "floor map", where "*the devices currently in use*" indoor), displaying the current location of the mobile device on the associated floor map portion of the localized area indoor map (also see column 3, lines 20-23, "*floor map*", where "*the devices currently in use*" indoor).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Welch into the system of Simons and Yamazaki in order to allow the user to visualize virtual images of the front panels of numerous (e.g., up to eight) devices (see Welch, column 3, lines 26-28).

13. Claims 14-17, 20 and 21 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Wrappe (US 2008/0280624) and further in view of McCall et al (US 6,738,628).

Regarding claim 14, Simons teaches a method of mapping a localized area comprising an interior of at least one enclosed structure (Abstract, “beacons 30, 32, 33”, and [0016], “several beacons located a few meters apart”), the method comprising steps of: deploying a series of beacons about the localized area comprising at least one enclosed structure (Abstract, “beacons 30, 32, 33”, and [0016], “several beacons located a few meters apart”), wherein at least a portion of the series of beacons are located to transmit within an interior of the at least one enclosed structure (see Abstract, [0005] *to* [0018], “beacons” and “broadcast”), scanning for any of the beacon signals using a mobile device, detecting at least one of the broadcast beacon signals (see [0034], see “*the CA terminal 14 is just within the broadcast range 12, and therefore the user may **receive** unsolicited or pushed service offers, adverts and the like on their CA terminal 14 from the beacon 10*”. Note that, in order to “receive”, the terminal 14 must “scan” for the signal), receiving at least one of the beacon signal by the mobile device (see [0034], see “*the CA terminal 14 is just within the broadcast range 12, and therefore the user may **receive** unsolicited or pushed service offers, adverts and the like on their CA terminal 14 from the beacon 10*”).

Simons does not specifically disclose customizing each beacon signal by embedding a beacon identifier within a beacon signal, wherein the beacon identifier distinguishes the beacon from the series of beacons, broadcasting the respective beacon signal comprising the embedded beacon identifier from each beacon of the series of beacons, initiating a process for providing marketing information associated with the beacon identifier to the mobile device, obtaining the marketing information

associated with the beacon identifier, and displaying the marketing information on the mobile device.

Wrappe teaches customizing each beacon signal by embedding a beacon identifier within a beacon signal (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID, identification"), wherein the beacon identifier distinguishes the beacon from the series of beacons (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID of the transmitter, identification"), broadcasting the respective beacon signal comprising the embedded beacon identifier from each beacon of the series of beacons (see [0013], [0033] and [0052], "data identify the site, e.g., unique ID of the transmitter, identification". Also see [0013], "*placing one or more beacon stations within a site*"), initiating a process for providing marketing information associated with the beacon identifier to the mobile device (also see [0013], "*commercial information of the site*"), obtaining the marketing information associated with the beacon identifier (also see [0013] and [0052], "*commercial information of the site*"), and displaying the marketing information on the mobile device (also see [0052], "*when a mobile station is identified to be entering (or exiting) the site, the* ***commercial information*** *(e.g.,* ***electronic coupon, a web page of advertisement****) is automatically transmitted to the mobile station* ***for display***").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Wrappe into the system of Simons in order to provide low cost electronic components can be used for short range

wireless data communication in accordance with wireless communication standards (see Wrappe, [0028]).

The combination of Simons and Wrappe does not specially disclose decoding the received beacon signal.

McCall teaches decoding the received beacon signal (see column 4, lines 33-36, "*If a signal is received from more than one beacon, then each of the signals is decoded to determine the beacon ID*").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of McCall into the system of Simons and Wrappe in order to automatically updates location information in a manner that needs no user intervention and is transparent to the overall management system (see McCall, column 2, lines 43-47).

Regarding claim 15, Simons teaches the beacon signal is a short range radio frequency being at least one of a Bluetooth signal and a Wi-Fi signal, the method further comprising a step of: transmitting the beacon signal as at least one of the Bluetooth signal and the Wi-Fi signal (see [0033], [0038], [0046], [0047] and [0048], "*Bluetooth*", "*IEEE*").

Regarding claim 16, the combination of Simons, Wrappe and McCall further teaches determining a location of the mobile device respective to the beacon associated with the received beacon signal (see Simons, fig.1, **range** 12, [0034], see "*the CA terminal 14 is just within the broadcast **range** 12, and therefore the user may receive unsolicited or pushed **service offers**, **adverts** and **the like** on their CA terminal 14 from*

the beacon 10", see Simons, [0016], "*airport*", [0020], "*shopping mall*", "*airport*", "*service*", and/or see Wrappe, [0052], "*when a mobile station is identified to be **entering** (or exiting) **the site**, the **commercial information** (e.g., **electronic coupon, a web page of advertisement**) is automatically transmitted to the mobile station **for display***"), displaying the location of the mobile device respective to the beacon associated with the received beacon signal on the mobile device (see Wrappe, [0052], "*when a mobile station is identified to be **entering** (or exiting) **the site**, the **commercial information** (e.g., electronic coupon, a web page of advertisement) is automatically transmitted to the mobile station **for display***". Note that in [0013], where Wrappe teaches associating "*the data identifying the site*" with "*commercial information*", where "*the data identifying the site*" includes "*a coordinate position*", so that when the mobile station enters the site, the location of the site which is the same location of the mobile device is displayed on the mobile station. In addition, also see [0013], "*transmitted according Bluetooth*", [0029], "*Bluetooth provides a short range (e.g., 10 centimeters to 10 meters*").

Regarding claim 17, the combination of Simons, Wrappe and McCall further teaches determining a location of the mobile device respective to the beacon associated with the received beacon signal, wherein location is determined using at least one of: signal strength of the beacon signal, triangulation using two or more beacon signals, and location information embedded within the beacon signal, and displaying the location of the mobile device respective to the beacon associated with the received beacon signal on the mobile device (see Simons, fig.1, range 12, and see [0009], "*range dependent upon the power of the beacon*". In this case, if the power of the beacon is

strong, a geographic location proximate the beacon is closer, on the other hand, if the power of the beacon is weak, a geographic location proximate the beacon is faraway. **In addition, see claim 5 above, where Gwon, [0076], teaches "*If a number of BTS cells are present such that the mobile node is receiving beacon signals from at least three BTS', conventional triangulation techniques based on relative beacon signal strength measurements can be used to determine the mobile node's distance from each BTS. Another way is to use GPS*"**).

Regarding claim 20, the combination of Simons, Wrappe and McCall further teaches utilizing beacon signals from the series of beacons to aid in navigation to the mobile device, when the mobile device is located within an interior of a structure where a global positioning system (GPS) is ineffective (see Wrappe, [0044] and [0046], "*where GPS signal blockage severely degrades*").

Regarding claim 21, the combination of Simons, Wrappe and McCall further teaches transmitting an arrival notification signal upon arrival proximate to one beacon of the series of beacons to notify at least one other party of arrival at the one beacon (see Wappe, [0046], "*when the mobile station enters the store, the dominant beacon signals received at the mobile station identifies the store*", and/or see McCall, column 6, lines 39-42, "*At each point on the grid, the system sends a message back to the server with its position, entered by the technician, and a list of the beacons it can receive*").

14. Claims 18 and 19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Simons (US 2003/0045280A1) in view of Wrappe (US

2008/0280624) and further in view of McCall et al (US 6,738,628) and Kishi et al (US 5,638,279).

Regarding claim 18, the combination of Simons, Wrappe and McCall further teaches determining a location of the mobile device respective to the beacon associated with the received beacon signal (see Simons, fig.1, **range** 12, [0034], see "*the CA terminal 14 is just within the broadcast **range** 12, and therefore the user may receive unsolicited or pushed **service offers**, **adverts** and **the like** on their CA terminal 14 from the beacon 10*", see Simons, [0016], "*airport*", [0020], "*shopping mall*", "*airport*", "*service*"), obtaining a localized area map associated with the location of the beacon (see Simons, [0041], "beacon", "shopping mall… provide…map"), determining a location of each of the mobile device and the beacon on the localized area map (see Simons, [0041], "beacon", "shopping mall… provide…map", and/or see Wrapper, [0046], "*stores and shops*", "*whether or not the mobile station is in a store can be determined from a map of the building"*), displaying the location of the mobile device respective to the beacon (see Wrappe, [0052], "*when a mobile station is identified to be **entering** (or exiting) **the site**, the **commercial information** (e.g., electronic coupon, a web page of advertisement) is automatically transmitted to the mobile station **for display***". Note that in [0013], where Wrappe teaches associating "*the data identifying the site*" with "*commercial information*", where "*the data identifying the site*" includes "*a coordinate position*", so that when the mobile station enters the site, the location of the site which is the same location of the mobile device is displayed on the mobile station. In addition,

see [0013], "*transmitted according Bluetooth*", [0029], "*Bluetooth provides a short range (e.g., 10 centimeters to 10 meters*", also see [0046], "*map of the building*").

The combination of Simons, Wrappe and McCall does not specifically disclose displaying the location of the mobile device respective to the beacon identifier overlaid upon the localized area map on the mobile device.

Kishi teaches displaying the location of the mobile device respective to the beacon identifier overlaid upon the localized area map on the mobile device (see fig.10, column 2, lines 63-67, "*a single wave (or beacon) generated from a signpost in the vicinity of an intersection*", and see column 7, lines 30-52, "*the name of the intersection is displayed at an intersection-name display 34a in the upper-right portion of the screen on which the map around the present position is displayed*").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Kishi into the system of Simons, Wrappe and McCall in order to automatically updates location information in a manner that needs no user intervention and is transparent to the overall management system (see Kishi, column 2, lines 43-47).

Regarding claim 19, the combination of Simons, Wrappe, McCall and Kishi further teaches the beacon associated with the received beacon signal is located within an enclosed structure (see Simons, fig.1, **range** 12, [0034], see "*the CA terminal 14 is just within the broadcast **range** 12, and therefore the user may receive unsolicited or pushed **service offers**, **adverts** and **the like** on their CA terminal 14 from the beacon 10*", also see [0016], "*airport*", [0020], "*shopping mall*", "*airport*", "*service*"), the method

further comprising steps of: determining a location of the mobile device respective to the beacon associated with the received beacon signal (also Simons, fig.1, **range** 12, [0034], see "*the CA terminal 14 is just within the broadcast **range** 12, and therefore the user may receive unsolicited or pushed **service offers**, **adverts** and **the like** on their CA terminal 14 from the beacon 10*", also see [0016], "*airport*", [0020], "*shopping mall*", "*airport*", "*service*"), obtaining a localized area indoor map associated with the location of the beacon (see [0041], "beacon", "shopping mall… provide…map"), determining a location of each of the mobile device and the beacon on the localized area indoor map (also Simons, fig.1, **range** 12, [0034], see "*the CA terminal 14 is just within the broadcast **range** 12, and therefore the user may receive unsolicited or pushed **service offers**, **adverts** and **the like** on their CA terminal 14 from the beacon 10*", also see [0016], "*airport*", [0020], "*shopping mall*", "*airport*", "*service*", [0041], "beacon", "shopping mall… provide…map", and/or see Wrapper, [0046], "*stores and shops*", "*whether or not the mobile station is in a store can be determined from a map of the building"*), displaying the location of the mobile device respective to the beacon associated with the received beacon signal overlaid upon the localized area map on the mobile device (see Kishi, fig.10, column 2, lines 63-67, "*a single wave (or beacon) generated from a signpost in the vicinity of an intersection*", and see column 7, lines 30-52, "*the name of the intersection is displayed at an intersection-name display 34a in the upper-right portion of the screen on which the map around the present position is displayed*").

Allowable Subject Matter

15. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 8, the combination of Simons and Yamazaki teaches traveling from the current location towards a subsequent location (see Simons, [0019] and [0020], "*move*"). The combination of Simons and Yamazaki fails to teach repeating the steps of determining a location of a mobile device to determine the subsequent location, determining a path between the current location and the subsequent location, and associating the current location and the subsequent location.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGHI H. LY whose telephone number is (571)272-7911. The examiner can normally be reached on 9:30am-8:00pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rafael Perez Gutierrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly
/Nghi H. Ly/
Primary Examiner, Art Unit 2642

Notice of References Cited	Application/Control No. 14/285,273	Applicant(s)/Patent Under Reexamination MENDELSON, EHUD	
	Examiner NGHI H. LY	Art Unit 2642	Page 1 of 1

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*	D	US-2004/0066917 A1	04-2004	Yasukawa et al.	379/088.01
*	E	US-7,743,337	06-2010	Maeda et al.	715/781
*	F	US-2008/0280624 A1	11-2008	Wrappe, Thomas Keith	455/456.1
*	G	US-6,738,628	05-2004	McCall et al.	455/456.1
*	H	US-5,319,363	06-1994	Welch et al.	340/8.1
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	J	US-			
	K	US-			
	L	US-			
	M	US-			

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	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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Ｇ０１Ｃ　21/00			Ｇ０１Ｃ　21/00	Ｚ	
Ｇ０１Ｓ　5/02			Ｇ０１Ｓ　5/02	Ｚ	
Ｇ０８Ｇ　1/0969			Ｇ０８Ｇ　1/0969		
Ｇ０９Ｂ　29/10			Ｇ０９Ｂ　29/10	Ａ	

審査請求　未請求　請求項の数12　ＯＬ　（全 27 頁）

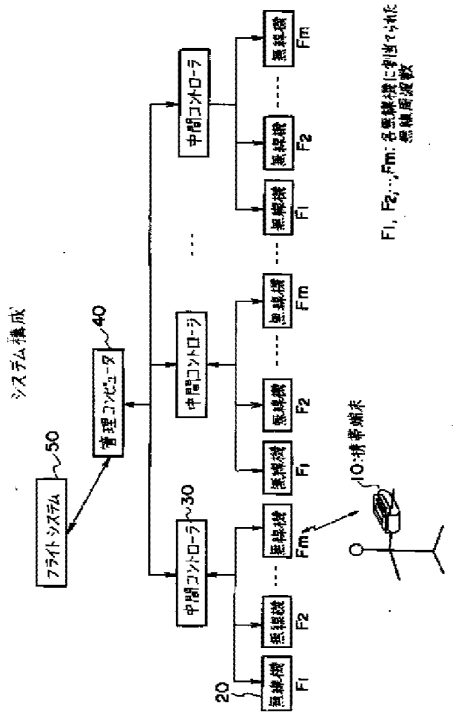
(21)出願番号　特願平7－287601

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(54)【発明の名称】　ルート案内システム

(57)【要約】
【課題】　空港ビル内等で利用者を案内する。
【解決手段】　各無線機２０の電波範囲にて空港ビル内の必要な領域を網羅できるよう空港ビル内に複数の無線機２０を分散配置し、電波範囲が重複する無線機２０同士が同じ無線周波数とならないよう各無線機２０に無線周波数Ｆ１～Ｆｍを割り当てる。旅客等の利用者により携帯される携帯端末１０は、各無線機２０から送信されその位置を示す無線機ＩＤを受信し、受信した無線機ＩＤに基づき自分の現在地を求め、さらに目的地に至るルートを求め、階間移動装置に留意して表示する。管理コンピュータ４０は、無線機２０を介し携帯端末１０から現在地情報を収集し、フライト情報及び旅客情報に基づき個別の携帯端末１０に対しメッセージ送信や呼出しを行う。



Google Ex. 1029, p. 359

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【特許請求の範囲】

【請求項１】　携帯端末との無線通信可能範囲が互いに重複する無線機同士の無線周波数が互いに異なるよう、複数の階を有する建物の屋内空間に分散配置された複数の無線機と、上記屋内空間を移動する利用者により携帯される上記携帯端末と、を有し、

上記無線機が、その位置を示す無線機位置情報を無線送信する手段を備え、

上記携帯端末が、上記無線機位置情報を無線受信する手段と、当該無線機位置情報に基づき当該携帯端末の現在地を示す現在地情報を生成する手段と、当該現在地情報、目的地を示す目的地情報及び上記建物の屋内地図を示す地図情報に基づき、現在地から目的地に至るルートを示すルート情報を生成する手段と、上記ルートの各階部分が含まれる各階地図を、上記ルート情報に基づき、かつ、同一階間移動装置の行方向又は列方向の位置が揃うよう単一画面上に並べて、可視表示する手段と、を備え、

複数階に亘る屋内空間にて上記携帯端末の利用者を目的地まで案内することを特徴とするルート案内システム。

【請求項２】　請求項１記載のルート案内システムにおいて、

上記携帯端末が、目的地の候補の分類を可視表示する手段と、利用者により操作される可操作部材と、利用者が可操作部材の操作によりいずれかの分類を選択した場合にその分類をさらに細かく分類して可視表示させる手段と、利用者が可操作部材の操作により入力終了を指示した場合にそれまでに選択された階層的な分類に従い目的地を決定する手段と、を備えることを特徴とするルート案内システム。

【請求項３】　請求項１又は２記載のルート案内システムにおいて、

上記無線機が、上記携帯端末の利用者の呼出し先を示す呼出し先情報及び／又は当該利用者に伝達すべきメッセージを示すメッセージ情報を無線送信する手段を備え、

上記携帯端末が、上記無線機から上記呼出し先情報及び／又はメッセージ情報を無線受信する手段と、上記呼出し先情報を上記目的地情報として扱う手段と、上記メッセージ情報に基づき上記メッセージを上記ルートと共に又は当該ルートに代えて可視表示する手段と、を備えることを特徴とするルート案内システム。

【請求項４】　請求項１乃至３記載のルート案内システムにおいて、

上記携帯端末が、相異なる階に配置されている複数の無線機からそれぞれ無線機位置情報を無線受信した場合に、当該無線機位置情報を無線送信した無線機の各階毎個数を判定し、当該個数が他の階に比べ少ない階に配置されている無線機からの無線機位置情報を、上記現在地情報の生成に使用することを禁止する手段を備えることを特徴とするルート案内システム。

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【請求項５】　請求項１乃至４記載のルート案内システムにおいて、

上記携帯端末が、上記建物内に設けられているトイレ、レストラン、階間移動装置等の設備の位置を示す情報を、外部記憶媒体から上記地図情報として読み出す手段を備えることを特徴とするルート案内システム。

【請求項６】　請求項１乃至５記載のルート案内システムにおいて、

上記携帯端末が、その携帯端末の現在地がルートから所定程度以上外れた場合に、ルートから外れた旨を当該携帯端末の利用者に報知する手段を備えることを特徴とするルート案内システム。

【請求項７】　請求項１乃至６記載のルート案内システムにおいて、

上記携帯端末が、その携帯端末の現在地がルートから所定程度以上外れた場合に、その時点での現在地から目的地に至るルートを示すルート情報を生成する手段を備えることを特徴とするルート案内システム。

【請求項８】　請求項１乃至７記載のルート案内システムにおいて、

上記携帯端末が、上記ルートの全体が単一画面上に表示されかつ当該ルートが最大表示されるよう、その現在地の変化に応じ表示倍率を変化させる手段を備えることを特徴とするルート案内システム。

【請求項９】　請求項８記載のルート案内システムにおいて、

上記携帯端末が、ルート及びその周辺のエリアを示す地図を表示するのみでは画面上の表示可能領域に対する実表示領域の不足が生じる場合に、隣接するエリアの地図にて表示を補填する手段と、補填の際、既に踏破されたルートの少なくとも一部を含むエリアの地図を優先的に使用する手段と、を備えることを特徴とするルート案内システム。

【請求項１０】　請求項１乃至９記載のルート案内システムにおいて、

上記携帯端末が、上記現在地情報を無線送信する手段を備え、

上記無線機が、上記現在地情報を無線受信する手段を備え、

上記ルート案内システムが、上記無線機により無線受信された上記現在地情報を収集することにより上記利用者の動向を管理する手段を有することを特徴とするルート案内システム。

【請求項１１】　請求項１０記載のルート案内システムにおいて、

上記無線機が、上記携帯端末からの返答を求める返答要求信号を、必要に応じ無線送信する手段を備え、

上記携帯端末が、上記返答要求信号を無線受信する手段と、当該返答要求信号に応じ上記現在地情報の無線送信を実行させる手段と、を備えることを特徴とするルート

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案内システム。

【請求項１２】　請求項１乃至１１記載のルート案内システムにおいて、

上記携帯端末が、その携帯端末の利用者の身体に当該携帯端末を着脱可能に固定するベルトを備えることを特徴とするルート案内システム。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、空港、大規模店舗、大規模公共施設等の屋内において利用者に対し進むべきルートに関する情報を提供するルート案内システムに関する。

【０００２】

【従来の技術】自位置等を示す位置情報を屋外の利用者に提供するシステムとしては、例えば、速度センサ及び方位センサを用いて自位置を求める推測航法や、インフラストラクチャから受信した情報に基づき自位置を求めるＧＰＳ（Global PositioningSystem ）等のシステムや、間隔配置されたビーコン局から識別符号を無線受信しこれを目的地に係る識別符号と比較することにより目的地への到来を検出するビーコンシステム（特開平６－５２４８７号参照）が知られている。また、これらのシステムと、ＣＤ－ＲＯＭ等により提供される地図データベースとを組み合わせることにより、現在地から目的地に至るルートを示すルート情報を利用者に提供することができる。例えば、ＧＰＳ等から得られる自位置、利用者から与えられる目的地、及びＣＤ－ＲＯＭ等に格納されている地図を用いてルート情報を生成し、可視表示する車載ナビゲーションシステムが既に普及している。

【０００３】

【発明が解決しようとする課題】しかし、このシステムは、屋内にいる者に対しルート情報を提供するには適していない。第１に、人工衛星（ＧＰＳ衛星）等のように屋外にあるインフラストラクチャからの信号は、屋根や壁により遮蔽される結果屋内では受信できないから、ＧＰＳ等のシステムを屋内で利用することは原理上不可能である。

【０００４】第２に、特開平６－５２４８７号に記載されているビーコンシステムは、単一の無線周波数を複数のビーコン局にて共用するシステムであるから、利用者がビーコン信号を受信した場合にその信号をどのビーコン局から受信したか確実に特定できるようにするためには、ビーコン局の間隔を疎にする（例えば無線通信可能範囲が互いに重複しないよう、かつ周辺環境の影響をも考慮しながら、相隣接するビーコン局の位置を広めに定める）必要がある。このようなビーコン局配置では利用者がビーコン信号を受信できない空白エリアが必ず発生するため、高々目的地又は経由地への到来・接近を検出できるに過ぎず、現在地から目的地に至るルートを利用者に知らしめることはできない。

【０００５】第３に、特開平６－５２４８７号に記載されているビーコンシステムを周知のセルラシステムを参考にして変形し、相異なる無線周波数を相隣接するビーコン局に割り当てかつ相隣接するビーコン局の無線通信可能範囲を重複させれば、上述の空白エリアの問題を解消できる。しかし、そのような変形を施すのみでは、単一平面上におけるルート情報を生成できるようになるに過ぎないから、一般に複数の階を有する建物の中で利用者を効率的かつ確実に目的地まで案内することはできない。

【０００６】本発明の第１の目的は、無線通信技術を利用することにより、屋内にいる者に対しルート情報を提供可能にすることにある。本発明の第２の目的は、利用者に対し無線信号を送信する無線機の間隔を密にしかつ電波範囲が重複する無線機に互いに異なる無線周波数を割り当てることにより、いずれの無線機からも無線信号を受信できない空白エリアをなくし利用者が常にルート情報の提供を受けられるようにすると共に、無線信号同士の衝突を防止することにある。本発明の第３の目的は、ルート表示方法を工夫することにより、利用者がルートを直観的に把握できるようにし、さらには複数の階を有する建物の中でも利用者を効率的かつ確実に目的地まで案内できるようにすることにある。

【０００７】本発明の第４の目的は、目的地の階層的入力を可能にすることにより、できるだけ少ない入力操作にて目的地を設定可能にし、利用者を行きたいところへ迅速に案内できるようにすることにある。本発明の第５の目的は、無線通信を利用することにより、必要に応じ利用者を所定又は特定の場所へ呼び出すことを可能にすることにある。本発明の第６の目的は、受信した無線信号の送信元の所属階に着目することにより、利用者が階段脇に立ち止まったときや通り過ぎたとき等においても間違いなく利用者を案内できるようにすることにある。本発明の第７の目的は、利用者が頻繁に利用するであろう設備又は利用者が利用する確率の高い設備に関する情報をデータベース化することにより、できるだけ少ない情報量の地図情報を用いて上述の各目的を達成可能にし、ひいては利用者が携帯する装置を小型簡素にすることにある。本発明の第８の目的は、案内されたルートを利用者が見失った場合に自力又は他力でリカバリする機会をその利用者に与えることにより、利用者を目的地まで確実かつ迅速に案内可能にすることにある。本発明の第９の目的は、ルートの表示方法を工夫することにより、現在地の変化によらず常に見易い形で利用者にルート情報を提供可能にし、以て使用性の高い装置を実現することにある。本発明の第１０の目的は、無線通信を利用することにより、利用者の動向を常に又は定期的に把握可能にすることにある。本発明の第１１の目的は、装置構造の工夫により、利用者が携帯しやすい装置を実現することにある。

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【０００８】

【課題を解決するための手段】このような目的を達成するために、本発明の第１の構成に係るルート案内システムは、携帯端末との無線機の無線通信可能範囲が互いに重複する無線機同士の無線周波数が互いに異なるよう、複数の階を有する建物の屋内空間に分散配置された複数の無線機と、上記屋内空間を移動する利用者により携帯される上記携帯端末と、を有し、上記無線機が、その位置を示す無線機位置情報を無線送信する手段を備え、上記携帯端末が、上記無線機位置情報を無線受信する手段と、当該無線機位置情報に基づき当該携帯端末の現在地を示す現在地情報を生成する手段と、当該現在地情報、目的地を示す目的地情報及び上記建物の屋内地図を示す地図情報に基づき、現在地から目的地に至るルートを示すルート情報を生成する手段と、上記ルートの各階部分が含まれる各階地図を、上記ルート情報に基づき、かつ、同一階間移動装置の行方向又は列方向の位置が揃うよう単一画面上に並べて、可視表示する手段と、を備え、複数階に亘る屋内空間にて上記携帯端末の利用者を目的地まで案内することを特徴とする。

【０００９】本構成においては、建物の屋内空間に分散配置された無線機を利用している。各無線機は、携帯端末との無線通信可能範囲が互いに重複するよう配置され、また各無線機には、携帯端末との無線通信可能範囲が互いに重複する無線機が同じ無線周波数を使用することがないよう、無線周波数が割り当てられている。従って、各携帯端末は常にいずれかの無線機から無線機位置情報を受信でき、従来のビーコンシステムで生じていたような空白エリアは生じないから、屋内空間を移動する利用者が常にルート情報を受け取ることができる。その際、無線機からの無線信号が衝突することもない。さらに、受信した無線機位置情報に基づきルート情報を生成する際、その携帯端末が複数の無線機と無線通信可能な位置にあれば、当該複数の無線機からの無線機位置情報をいずれも利用できるから、現在地情報の精度・分解能は高く、従ってルート情報もより正確になる。本構成においては、さらに、ルート情報に基づきルートを可視表示する際、ルートの各階部分が含まれる各階地図が単一画面上に並べて可視表示される。従って、利用者は複数階にまたがるルートを常に一覧できる。同時に、各階地図を並べて可視表示する際、同一の階間移動装置（例えばエレベータ、エスカレータ、階段等）の行方向又は列方向の位置が揃うよう各階位置を位置決めしているから、利用者は表示画面から直観的に現在地、目的地、ルート等の相互関係を見て取ることができる。このように、本構成においては、複数の階を有する建物における利用者の案内が、効率化及び確実化される。

【００１０】本発明の第２の構成に係るルート案内システムは、第１の構成において、上記携帯端末が、目的地の候補の分類を可視表示する手段と、利用者により操作

される可操作部材と、利用者が可操作部材の操作によりいずれかの分類を選択した場合にその分類をさらに細かく分類して可視表示させる手段と、利用者が可操作部材の操作により入力終了を指示した場合にそれまでに選択された階層的な分類に従い目的地を決定する手段と、を備えることを特徴とする。本構成においては、目的地の階層的入力を可能にしているため、最少の入力操作にて目的地を設定でき、利用者を行きたいところへ迅速に案内可能になる。

【００１１】本発明の第３の構成に係るルート案内システムは、第１又は第２の構成において、上記無線機が、上記携帯端末の利用者の呼出し先を示す呼出し先情報及び／又は当該利用者に伝達すべきメッセージを示すメッセージ情報を無線送信する手段を備え、上記携帯端末が、上記無線機から上記呼出し先情報及び／又はメッセージ情報を無線受信する手段と、上記呼出し先情報を上記目的地情報として扱う手段と、上記メッセージ情報に基づき上記メッセージを上記ルートと共に又は当該ルートに代えて可視表示する手段と、を備えることを特徴とする。本構成においては、呼出し先情報の無線送信にて各携帯端末に目的地を設定しまたメッセージを送信しているため、必要に応じ利用者を所定の又は特定の場所へ呼び出またメッセージを伝達することが可能になる。

【００１２】本発明の第４の構成に係るルート案内システムは、第１乃至第３の構成において、上記携帯端末が、相異なる階に配置されている複数の無線機からそれぞれ無線機位置情報を無線受信した場合に、当該無線機位置情報を無線送信した無線機の各階毎個数を判定し、当該個数が他の階に比べ少ない階に配置されている無線機からの無線機位置情報を、上記現在地情報の生成に使用することを禁止する手段を備えることを特徴とする。本構成においては、各階毎に受信無線信号の多寡を判定し多数階からの無線機位置情報を現在地決定に利用しているため、例えば、利用者が階段脇に立ち止まったときや通り過ぎたとき等のように複数の階から同時に無線機位置情報を受信できるような状況でも、間違いなく利用者が案内される。

【００１３】本発明の第５の構成に係るルート案内システムは、第１乃至第４の構成において、上記携帯端末が、上記建物内に設けられているトイレ、レストラン、階間移動装置等の設備の位置を示す情報を、外部記憶媒体から上記地図情報として読み出す手段を備えることを特徴とする。本構成においては、利用者が頻繁に利用するであろう設備又は利用者が利用する確率の高い設備に関する情報が外部記憶媒体上にデータベース化されているため、地図情報の情報量が少なくて済み、従って携帯端末が小型簡素になる。

【００１４】本発明の第６の構成に係るルート案内システムは、第１乃至第５の構成において、上記携帯端末が、その携帯端末の現在地がルートから所定程度以上外

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れた場合に、ルートから外れた旨を当該携帯端末の利用者に報知する手段を備えることを特徴とする。本発明の第７の構成に係るルート案内システムは、第１乃至第６の構成において、上記携帯端末が、その携帯端末の現在地がルートから所定程度以上外れた場合に、上記現在地情報、目的地情報及び地図情報に基づき、ルート情報を再度生成する手段を備えることを特徴とする。これらの構成においては、案内されたルートを利用者が見失った場合に、ルート外れ報知（第６の構成）又は再案内（第７の構成）によりリカバリの機会が利用者に与えられるから、利用者が目的地までより確実かつ迅速に案内される。さらに、携帯端末の現在地がルートから所定程度以上外れたか否かの判定は、その時点で無線機から受信できる無線周波数や無線機位置情報が予測から外れたか否かの判定として実現できるから、上記ルート外れ判定により格別の負荷が発生することもない。

【００１５】本発明の第８の構成に係るルート案内システムは、第１乃至第７の構成において、上記携帯端末が、上記ルートの全体が単一画面上に表示されかつ当該ルートが最大表示されるよう、その現在地の変化に応じ表示倍率を変化させる手段を備えることを特徴とする。本発明の第９の構成に係るルート案内システムは、第８の構成において、上記携帯端末が、ルート及びその周辺のエリアを示す地図を表示するのみでは画面上の表示可能領域に対する実表示領域の不足が生じる場合に、隣接するエリアの地図にて表示を補填する手段と、補填の際、既に踏破されたルートの少なくとも一部を含むエリアの地図を優先的に使用する手段と、を備えることを特徴とする。これらの構成においては、利用者の移動に伴いルート表示が適宜変化（通常は拡大）していくから、現在地の変化によらず常に見易いルート表示が実現され、これにより使用性が高まる。特に、第９の構成においては、ルートが属するエリアのみでは画面を満たせない場合に既に踏破されたルートの少なくとも一部を優先的に表示できるから、さらに見易いルート表示が実現され、より使用性が高まる。

【００１６】本発明の第１０の構成に係るルート案内システムは、第１乃至第９の構成において、上記携帯端末が、上記現在地情報を無線送信する手段を備え、上記無線機が、上記現在地情報を無線受信する手段を備え、上記ルート案内システムが、上記無線機により無線受信された上記現在地情報を収集することにより上記利用者の動向を管理する手段を有することを特徴とする。本発明の第１１の構成に係るルート案内システムは、第１０の構成において、上記無線機が、上記携帯端末からの返答を求める返答要求信号を、必要に応じ無線送信する手段を備え、上記携帯端末が、上記返答要求信号を無線受信する手段と、当該返答要求信号に応じ上記現在地情報の無線送信を実行させる手段と、を備えることを特徴とする。これらの構成においては、利用者の動向が常に又は定期的に把握される。特に、第１１の構成においては、返答要求信号の送信及びその受信に応じた現在地情報の送受信を介し随時利用者の動向を知ることができるから、第３の構成に係る呼出し等をより好適に実行可能になる。

【００１７】本発明の第１２の構成に係るルート案内システムは、第１乃至第１１の構成において、上記携帯端末が、その携帯端末の利用者の身体に当該携帯端末を着脱可能に固定するベルトを備えることを特徴とする。本構成においては、ベルトを用いた身体への装着により、利用者が携帯しやすい携帯端末が実現される。

【００１８】

【発明の実施の形態】以下、図面に基づきかつ本発明を空港内のルート案内システムとして実施した場合を例として、本発明に関し説明する。なお、本発明は、空港ビル以外の建物、例えば駅やショッピングセンター等にも適用できる。

【００１９】（１）システム構成

図１には、本発明の一実施形態に係る空港内ルート案内システムの一例が示されている。このシステムは、携帯端末１０、無線機２０、中間コントローラ３０及び管理コンピュータ４０から構成されており、さらにフライトシステム５０と接続されている。

【００２０】これらのうち携帯端末１０は、空港ビルの利用者、例えば搭乗待ちの旅客がそれぞれ１個ずつ携帯する小型の無線端末であり、利用者に対し、その現在地、現在地から目的地に至るルート、管理コンピュータ４０からのメッセージ、ルート外れを警告するメッセージ等を提供する機能を有している。また、携帯端末１０は、後述する無線周波数Ｆ１～Ｆｍをスキャンするマルチスキャン機能や、受信した信号の無線周波数にて返答を送信する機能を備えている。携帯端末１０は、近接電磁界通信が可能であればよいため、無線端末としては省電力・小形である。

【００２１】各無線機２０は、対応する中間コントローラ３０又はこれを介した管理コンピュータ４０からの指令に応じ、あるいは携帯端末１０における現在地演算のため定期的に、携帯端末１０に宛てて無線信号を送信する無線中継機である。無線機２０も、近接電磁界通信が可能であればよいため、無線中継機としては省電力・小形である。また、無線機２０は、少なくとも旅客等が進入可能な全てのエリアをその電波範囲（携帯端末１０への電波の送信及び携帯端末１０からの電波の受信が可能な範囲）の網でカバーできるよう、空港ビル内に分散配置されている。従って、そのようなエリア内では、相隣接する無線機２０の電波範囲は一般に互いに一部重複している。本実施形態では、このように無線機２０を配置しているため、各携帯端末１０は常にいずれかの無線機２０から無線信号を受信できる。すなわち、従来のビーコンシステムで生じていたような空白エリアは生じな

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い。無論、屋外のインフラストラクチャを利用したりまた屋外に新たなインフラストラクチャを設ける必要もない。

【００２２】さらに、各無線機２０には、その電波範囲が重複する（一般には相隣り合う）無線機２０同士が同じ無線周波数を使用することとならないよう、すなわち無線機２０同士の無線信号が衝突しないよう、Ｆ１～Ｆｍ（ｍ：２以上の自然数）のうちいずれかの無線周波数が割り当てられており、各無線機２０は割り当てられた無線周波数にて無線信号を送受信する。仮に、相隣接する無線機２０に同一無線周波数を割り当てたとすると、複数の無線機２０の電波範囲に重複所属している領域において、これらの無線機２０からの無線信号が衝突し正常な無線通信を確保し得ないこととなり得るが、本実施形態ではそのような支障は生じない。

【００２３】さらに、無線機２０からの無線信号には、その無線機２０に固有の無線ＩＤが含まれており各携帯端末１０はこれを送元たる無線機２０及びその位置の特定に使用している。上述のような無線周波数割当ては、送元たる無線機２０の特定にも寄与し得る。すなわち、後述の手順により無線周波数と無線機ＩＤの対応付けを終えた後利用者があまり移動しない間であれば、仮に無線機ＩＤを好適に検出できなかった場合でも、検出した無線周波数を基に、送元たる無線機２０を区別又は特定できる。

【００２４】なお、空港ビル及びその周辺では航空管制その他の目的で各種の無線システムが使用されているが、本実施形態に係るシステムは基本的には弱電界のシステムであり、また使用する無線周波数もこれらの無線システムと異なるから、これらの無線システムとの相互干渉は生じにくい。スペクトル拡散その他の無線技術の利用も可能である。

【００２５】中間コントローラ３０は一般に複数設けられており、それぞれ一般に複数の無線機２０を管理する。管理コンピュータ４０は一般に複数の中間コントローラ３０を管理する。なお、システムが小規模な場合は中間コントローラ３０を設ける必要はない。

【００２６】（２）携帯端末の構成

図２には、携帯端末１０の外観が示されている。携帯端末１０の筐体の表面には、ルート表示欄１１、項目表示欄１２、メッセージ表示欄１３及び複数の押し釦１４が設けられており、背面にはベルト１５が設けられており、側面にはカードポート（図示せず）が設けられている。ルート表示欄１１、項目表示欄１２及びメッセージ表示欄１３は、携帯を可能にするため、ＬＣＤ等のように小型で平板状の表示デバイスにて実現するのが好ましい。押し釦１４は、項目表示欄１２に表示されている項目を利用者が選択できるようにするために、項目表示欄１２と並んで設けられている。押し釦１４に代え、タッチパネル等を用いても構わない。ベルト１５は、携帯端末１０を利用者の腕等に固定する手段である。ベルト１５を用いた身体への装着により、利用者が携帯しやすくなる。ベルト１５は携帯端末１０の本体に着脱可能であり、利用者は自分の好みでベルト１５を使用／不使用とすることできる。カードポートは、空港ビルの屋内地図が情報として格納されているＩＣカード１６を着脱可能なデータ入力ポートである。

【００２７】携帯端末１０は、そのルート表示欄１１上に、現在地から目的地に至るルートを、空港ビルの屋内地図と重ねて表示させる。このような表示を実現するためには、屋内地図情報、目的地情報及び現在地情報が必要である。携帯端末１０は、これらのうち屋内地図情報を、そのカードポートに装着されたＩＣカード１６から読み出す。ＩＣカード１６の交換により屋内地図情報を更新乃至変更できるため、ＩＣカード１６の交換のみで、空港ビルの屋内交通状況の変更・変化（空港ビルの新築・増改築、一方通行規制の変更、一時的な進入規制等）に対処でき、また本実施形態における携帯端末１０を他の建物（例えば駅）に転用できる。

【００２８】目的地情報は、項目表示欄１２及び押し釦１４を用いた階層的な入力操作（後述）により利用者から与えられる。すなわち、利用者は、項目表示欄１２に表示されている項目のうちいずれかを、その項目の横にある押し釦１４の操作により選択する、という簡便な操作の繰り返しにより、携帯端末１０に自分の目的地を設定する。目的地情報は、搭乗便の出発時刻が切迫しているとき等には、管理コンピュータ４０等から呼出し先情報として与えられる。

【００２９】携帯端末１０は、図示しないが、無線機２０との間で情報を無線送受信するための無線回路や、無線送受信に係る情報を処理するための処理回路を内蔵している。現在地情報は、無線機２０から無線送信される情報のうち無線機ＩＤと呼ばれその無線機２０の位置を示す情報に基づき生成される。その手順に関しては後述する。

【００３０】このようにして、空港ビルの屋内地図を示す屋内地図情報と、利用者の目的地を示す目的地情報と、利用者の現在地を示す現在地情報とが得られると、携帯端末１０は、現在地から目的地に至るルートを求め、求めたルートを、そのルートを含む屋内地図と重ね合わせてかつ現在地や目的地と共にルート表示欄１１上に表示する。本実施形態では、その際、携帯端末１０により現在地や目的地、さらにはルート周辺の目立つ設備（トイレ、レストラン、エスカレータ、モニュメント等）を文字や目立つ記号で表示させることにより、利用者による視認性能を高めている。また、本実施形態では、現在地、目的地及びルートを表示する際、携帯端末１０により併せて目的地までの距離や所要時間を屋内地図情報や平均的な歩行速度等に基づき計算させ表示させることにより、使用性を向上させている。

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【００３１】また、携帯端末１０は、管理コンピュータ４０等からのメッセージが無線受信されている場合にはそのメッセージを、利用者が移動した結果その現在地がルートから外れた場合にはその旨のメッセージを、メッセージ表示欄１３により表示させる。

【００３２】（３）アドレス構造

無線機２０の位置、携帯端末１０の現在地及び目的地、さらには屋内地図情報を構成する各設備の位置は、本実施形態では、図３に示される構造を有するアドレスにて表現される。すなわち、この実施形態では、空港ビル内における三次元的な位置を表記するために、図３に示される構造を有するアドレス表記“○－○－○－○○－○”を採用している。

【００３３】この表記“○－○－○－○○－○”のうち最初の数字乃至記号“○”はいずれかの「階」を、これに続く数字乃至記号“○－○”はその「階」の中のいずれかの「ページ」を、さらにこれに続く数字乃至記号“○○－○”はその「ページ」の中のいずれかの「アドレス」を、それぞれ特定している。また、「ページ」は図３（ｂ）に示されるようにその所属「階」の行列区画であり、「ページ」“○－○”のうち最初の“○”は行を、後の“○”は列を、それぞれ示している。「アドレス」は図３（ｃ）に示されるようにその所属「ページ」の行列区画であり、「アドレス」“○○－○”のうち最初の“○○”は行を、後の“○”は列を、それぞれ示している。例えばアドレス“１－３－３－０１－Ａ”は、「１階」の「第３－３ページ」の「アドレス０１－Ａ」を意味する。このような階層的なアドレス表記を使用することにより、空港ビル内の位置を、高い分解能で、表記及び特定できる。例えば、先に説明した無線機２０の配置の一例をページ“１－３－３”を例として示すと、図３（ｃ）のようになる。図中黒い星印は無線機２０の位置を、円はその電波範囲を、それぞれ示している。

【００３４】また、ＩＣカード１６上の屋内地図情報（カードデータ）も、このアドレスを用いて記述されている。例えばトイレに関するカードデータは、図４（ａ）に示されるように、そのトイレの特徴（一般用か、障害者用か等）、そのトイレが占有しているアドレスの範囲、及びそのトイレが面しているブロック（アドレスが付与される最小の単位。図３（ｃ）参照）の個数を互いに対応付けた構成を有している。さらに、レストランに関するカードデータは、図４（ｂ）に示されるように、そのレストランの特徴（洋食か、和食か、ファーストフードか等）、そのレストランが占有しているアドレスの範囲、及びそのレストランが面しているブロックの個数を互いに対応付けた構成を有している。また、階間移動装置に関するカードデータは、図４（ｃ）に示されるように、その階間移動装置の特徴（エレベータかエスカレータか等）、並びにその階間移動装置の始点及び終点（必要な場合には経由点も）のアドレスを互いに対応付けた構成を有している。

【００３５】このように、本実施形態においては、利用者が頻繁に利用するであろう設備や利用者が利用する確率の高い設備に関する情報を、ＩＣカード１６上にデータベース化している。すなわち、空港ビルの屋内地図映像データそのものではなく、空港ビル内にある各種の設備（トイレ、レストラン、エレベータ、モニュメント等）の位置を示す情報の集合を地図情報としてＩＣカード１６上に格納しているため、地図情報の情報量が少なくて済む。これは、ＩＣカード１６の記憶容量節約・低廉化や、携帯端末１０の小型化・低廉化に役立っている。

【００３６】なお、ここでは、空港ビルが図３（ａ）に示されるように地上Ｎ階地下Ｍ階（Ｎ，Ｍ：自然数、Ｎ＋Ｍ＞２）の建物であると考えており、また各「階」をｎ行ｎ列（ｎ：自然数）に、各「ページ」を２６行２６列に、それぞれ行列区画しているが、このような建物構成及び区画は一例にすぎない。尚、本実施形態では現在地の判断用に後述のように無線機ＩＤ及び無線周波数を各携帯端末１０が検出・収集する方式を採用しているが、ＩＣカード１６上にはルート外れか否かの判断用に無線機２０の位置や無線周波数に関する情報を搭載している。

【００３７】（４）無線インタフェース

図５には、携帯端末１０と無線機２０の間で無線送受信される信号のフレーム構成、すなわち無線インタフェースの構成が示されている。特に図５（ａ）は無線機２０から携帯端末１０へ送信される無線機送信フレームの、図５（ｂ）は携帯端末１０から無線機２０へ送信される携帯端末送信フレームの、構成を示している。無線機２０は、対応する中間コントローラ３０からの指令に応じ、又はこの中間コントローラ３０を介した管理コンピュータ４０からの指令に応じ、無線機送信フレームを無線送信する。また、いずれかの無線機２０から無線機送信フレームを受信した携帯端末１０は、その無線機送信フレームが所定の条件を満たしている場合、携帯端末送信フレームを無線送信する。

【００３８】無線機送信フレームは、“無線機ＩＤ”、“メッセージ有無フラグ”、“呼出し先アドレス”、“携帯端末ＩＤ”、“メッセージ”及び“返答要求有無フラグ”を含んでいる。これらのうち“無線機ＩＤ”及び“携帯端末ＩＤ”は、その無線フレームの送元及び宛先を特定する情報であり、それぞれ、送元たる無線機２０及び宛先たる携帯端末１０に固有の識別符号である。この実施形態では無線機２０が固定的に配置されているから、“無線機ＩＤ”としては、その無線機２０の位置を示し図３に従い表記されたアドレスを用いている。また、“メッセージ”は管理コンピュータ４０等が宛先たる携帯端末１０の利用者に伝達したがっている情報であり、“メッセージ有無フラグ”はその無線機送信フレー

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ムに“メッセージ”が含まれているか否かを示すフラグである。“呼出し先アドレス”は、管理コンピュータ４０等が宛先たる携帯端末１０の利用者を特定の場所（例えば搭乗口）に呼び出したいときに、当該利用者に呼出し先の場所を知らせるために使用され、上述のアドレス表記に従い記述される。“返答要求有無フラグ”は、その無線機送信フレームが、宛先たる携帯端末１０からの返答を必要とする性格のフレームであるか否かを示すフラグである。

【００３９】携帯端末送信フレームは、“携帯端末ＩＤ”、“確認有無フラグ”及び“現在地アドレス”を含んでいる。これらのうち“携帯端末ＩＤ”は送元たる携帯端末１０に固有の識別符号である。また、“確認有無フラグ”は、先立って受信した無線機送信フレーム中の“メッセージ”を利用者が確認したか否かを示すフラグである。“現在地アドレス”は送元たる携帯端末１０及びその利用者の現在地を示す情報であり図３に従い表記される。

【００４０】これらのフレームには、携帯端末１０に対し又は無線機２０に対し動作指令を与える情報（コマンド）が含まれていない。すなわち、本実施形態にて使用される無線フレームは各種の移動無線等にて採用されているものよりも簡単かつ単調な構成であり、従って無線機２０及び携帯端末１０における無線制御が簡単である。なお、本発明は無線インタフェースの細部に限定を要するものではない。

【００４１】（５）施設部分の動作

管理コンピュータ４０及び中間コントローラ３０は、図６及び図７に示される手順に従って動作する。これらの図のうち図６は定時一斉同報に係る手順であり、図７は特定利用者へのメッセージ送信や特定利用者の呼出しのため実行される手順である。

【００４２】まず、図６に示されるように、各中間コントローラ３０はそれぞれその管理下にあるすべての無線機２０に対し、定時一斉同報を指令する（１００）。この定時一斉同報指令は、無線機送信フレームに含まれるべき情報のうち、無線機ＩＤを除く情報を含んでいる。無線機２０は、対応する中間コントローラ３０から定時一斉同報指令を受信したとき（１０２）、その指令に含まれる情報及び自己の無線機ＩＤに基づき無線機送信フレームを構成し（１０４）、この無線機送信フレームを自分に割り当てられている無線周波数にて無線送信する（１０６）。

【００４３】一方、携帯端末１０は、常に、無線周波数Ｆ１～Ｆｍにおける信号受信有無をモニタしている（無線周波数のマルチスキャン）。携帯端末１０は、このマルチスキャンによりいずれかの無線機２０からの無線機送信フレームの受信を検出したとき（１０８）、まずこの無線機送信フレームに返答すべきか否かを判断し（１１０）、返答すべきであると判断した場合にのみ、無線機２０から受信した無線機送信フレームに係る無線周波数と同一の無線周波数にて、かつその無線周波数により無線機２０が送信を行っていないタイミングで、携帯端末送信フレームを送信する（１１２）。

【００４４】無線機２０は、いずれかの携帯端末１０から携帯端末送信フレームを受信したとき（１１４）、その携帯端末送信フレームに含まれている情報及び自分の無線機ＩＤを（１１６）、対応する中間コントローラ３０に送信する（１１８）。中間コントローラ３０は、自分の管理下にある無線機２０から受信した情報を（１２０）、少なくとも状態監視信号を受信するまで保持する（１２２）。管理コンピュータ４０は、自分の管理下にある中間コントローラ３０に対し、定期的に状態監視信号を送信する（１２４）。状態監視信号を受信すると（１２６）、中間コントローラ３０は保持している情報を管理コンピュータ４０に送信する（１２８）。このようにして中間コントローラ３０から携帯端末１０に関する情報を受信した管理コンピュータ４０は（１３０）、受信した情報に基づき旅客情報を修正し（１３２）、これを管理コンピュータ４０の操作者に提供すべく表示装置の画面上に表示する（１３４）。

【００４５】ここにいう旅客情報とは、図８（ｂ）に示されるように、各携帯端末１０の携帯端末ＩＤ、その携帯端末１０を携帯している利用者の氏名、その利用者が搭乗する予定の便の便名、その利用者の現在地アドレス等から構成されている。従って、“返答要求有無フラグ”＝“有”の無線機送信フレームの送信を指令する定時一斉同報指令を定期的に発し、その結果各携帯端末１０から返信される携帯端末送信フレーム中の“現在地アドレス”をステップ１１４～１３０の動作にて管理コンピュータ４０に収集し、これに基づき旅客情報を修正すれば、各利用者が今どこにいるのかを、適当な頻度で管理コンピュータ４０が把握することができる。なお、図６に示される手順を好適に実行するためには、旅客情報が管理コンピュータ４０に初期登録されていなければならない。初期登録の手順に関しては簡略化のためここでは説明を省略しているが、例えば、これから空港ビルを利用しようとしている者に携帯端末１０又はＩＣカード１６を貸与する際その者が申告した情報や、後述のフライト情報を用いれば、そのような初期登録を行えることは理解されるであろう。

【００４６】管理コンピュータ４０は、このような定期的な旅客情報の更新・保守の他に、旅客情報を利用した各利用者の動向把握・管理に関連する処理を実行する。すなわち、図７に示されるように、管理コンピュータ４０は、フライトシステム５０からフライト情報を入力し、これを自分が保持している旅客情報と比較照合する（１３６）。フライト情報は、図８（ａ）に示されるように、発着予定便の便名、その便の発着予定時刻、その便に関する有意な情報（例えばキャンセルか否か）等か

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ら構成されている。従って、フライト情報と旅客情報とを照らし合わせることにより、出発時刻が迫っている便に搭乗する予定の旅客（携帯端末１０の利用者）等を特定することができ、また出発時刻が迫っている便に搭乗する予定でまだ搭乗していない旅客（携帯端末１０の利用者）等を特定することができる。そのような特定利用者に対しては、「○○××便の発着時刻は○○：○○です」等のように利用者による確認を必要とするメッセージの送信や、「第○○搭乗ゲートへおいで下さい」等の特定の場所への特定の利用者の呼出しを行うことが必要である。

【００４７】そこで、管理コンピュータ４０は、フライト情報と旅客情報との照合結果に応じ、上述のメッセージ等を含み無線機送信フレームに含まれるべき情報（無線機ＩＤを除く）、すなわち送信データを作成し（１３８）、これを各中間コントローラ３０に送信する（１４０）。管理コンピュータ４０からこの送信データを受信したとき（１４２）、中間コントローラ３０は、これを自分の管理下にある無線機に送信する（１４４）。以後、図６の手順と同様にしてステップ１０２～１２０及び１３０～１３４が実行される（状態監視信号に関するステップ１２２～１２６はここでは実行する必要がない）。管理コンピュータ４０は、メッセージ送信先たる利用者又は呼出し対象たる利用者の携帯端末１０から“確認有無フラグ”＝“有”の携帯端末送信フレームが送信されたことをステップ１３０にて検出するまでは、その利用者に関し図７の手順を繰り返し実行する。これにより、特定の利用者に必要なメッセージを伝達でき、また特定の利用者を特定の場所に呼び出すことができる。

【００４８】また、“確認有無フラグ”が“有”か“無”かに関わらずステップ１３２にて旅客情報を修正しステップ１３４にてこれを表示しているから、例えば所定回数呼出しを行ったにも関わらず確認有りの携帯端末送信フレームをその特定利用者の携帯端末１０が送信していない場合等でも、管理コンピュータ４０の操作者はその特定利用者の現在地（＝現在地アドレス）を知ることができる。従って、管理コンピュータ４０の操作者又はこの操作者から連絡を受けた空港係員がその特定利用者の現在地まで駆け付けることができる。これは、搭乗便の出発時刻が切迫しているのにまだ搭乗していない旅客を搭乗口まで案内する処置や、急病にみまわれ携帯端末１０を操作できない状況で倒れている利用者の発見・対処等に役立つ。特に、ステップ１３４にて当該特定利用者の応答履歴を警告表示するようにすれば、上述のような状況を早期に把握することが容易になる。

【００４９】さらに、図６及び図７に示される手順を利用して、各携帯端末１０にフライトスケジュールを送信することもできる。その際には、無線機送信フレーム中の“メッセージ”にフライトスケジュール情報を設定し、“メッセージ有無フラグ”及び“返答要求有無フラグ”をそれぞれ“有”及び“無”に設定すればよい。

【００５０】図９には、図６及び図７におけるステップ１０８～１１２の機能を実現するため携帯端末１０により所定頻度で繰り返し実行される無線機送信フレームへの応答手順が示されている。この図に示される手順は、その携帯端末１０が無線機送信フレームを受信し（２００）かつその無線機送信フレーム中の“携帯端末ＩＤ”が自分の携帯端末ＩＤと同じであったとき（２０２）、すなわち携帯端末１０が自分宛ての無線機送信フレームを受信したときに実行される。携帯端末１０による応答はこのように受動的であるため、本実施形態では、空港ビル内における無線トラフィックを管理コンピュータ４０や中間コントローラ３０の側で制御又は設定することができる。また、すべての携帯端末１０を呼び出すことができるあるいは複数の携帯端末１０を同時に呼び出すことができる特殊なＩＤを予め準備しておくことが可能なシステムに本発明を適用する場合には、ステップ２０４移行の動作を、無線機送信フレーム中の“携帯端末ＩＤ”がその特殊なＩＤと同じであったときもその携帯端末１０により実行させることができる。このようにすれば、システムに含まれるすべての又は上記特殊なＩＤを共有する複数の携帯端末１０に対し、同じメッセージを同時に伝達し又は同じ場所へ同時に呼び出すことが可能になる。

【００５１】自分宛ての無線機送信フレームを受信した携帯端末１０は、その無線機送信フレーム中の“メッセージ有無フラグ”及び“返答要求有無フラグ”の値を検出する（２０４，２０６，２１２）。“メッセージ有無フラグ”がメッセージ“無”を示す値である場合には（２０４）、無線機２０側がその携帯端末１０の利用者にメッセージを伝達しようとしていない、と見なせるため、その携帯端末１０はメッセージ表示等の動作を実行しないまま、図９の動作を終了する。但し、“メッセージ有無フラグ”がそれメッセージ“無”を示す値であっても、“返答要求有無フラグ”が返答要求“有”を示す値である場合には（２０６）、無線機２０側がその携帯端末１０に対し返答を要求している、と見なせるため、その携帯端末１０は後述の動作により逐次生成される現在地アドレスを含む携帯端末送信フレームを無線送信する（２０８）。なお、ステップ２０８における送信は、送信先の無線機２０又はこれと同一無線周波数の無線機２０からの送信が停止しているときに実行する。ステップ２０４が実行された後ステップ２０８を実行せずに図９の動作を終了する状況の一例としては、携帯端末１０に現在地判定（後述）を行わせるための送信が定時一斉同報指令等に応じ行われた状況を掲げることができる。ステップ２０８が実行される状況の一例としては、携帯端末１０の現在地アドレスの収集や機能確認のための送信が定時一斉同報指令等に応じ行われた状況を掲げるこ

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とができる。

【００５２】“メッセージ有無フラグ”がメッセージ“有”を示す値である場合には（２０４）、携帯端末１０は、その無線機送信フレーム中の“メッセージ”をそのまま又は文字若しくは記号情報に変換し、メッセージ表示欄１３上に例えば図１０のような形で表示させる（２１０）。このとき、頻繁に使用されるであろうメッセージを予めＩＣカード１６上に又は携帯端末１０内部の記憶素子上にコード化して格納しておけば、受信した無線機送信フレーム中の“メッセージ”を文字又は記号情報に変換する処理を高速化できる。また、メッセージ表示と共に音響や振動を発するようにすれば、利用者がメッセージ受信に容易に気付くことができる。

【００５３】図１０においては、メッセージ表示欄１３上に「搭乗口までおいで下さい。確認釦を押して下さい」等のメッセージが表示されるから、その携帯端末１０の利用者は、表示されたメッセージを読むことにより、例えば搭乗時刻の到来等を知ることができる。また、このときいずれかの押し釦１４に確認釦の機能を割り当てその押し釦１４の横（項目表示欄１２上）に「確認」と表示しておけば、利用者がメッセージ受領を確認したことを、後述するステップ２１４以降の処理にて確認することが可能になる。特に、表示されるメッセージに図１０に示されるように「確認釦を押して下さい」等と付記しておけば、利用者による確認操作（確認釦たる押し釦１４の操作）を促すことができる。なお、メッセージの内容はこのような呼出しに限られるものではなく、フライト情報の提供、商業宣伝的な情報の提供、外部からの伝言の中継、空港施設の利用案内、法令の紹介等でもよい。

【００５４】さらに、図１０の例ではルート表示欄１１とメッセージ表示欄１３が同時に現れているが、図１０上のルート表示欄１１及びメッセージ表示欄１３双方の画面領域を、メッセージ表示時には共にメッセージ表示欄１３として用い、逆にメッセージ非表示時には共にルート表示欄１１として用いることも可能である。このようにすれば、メッセージ表示時にはメッセージを、メッセージ非表示時にはルートを、それぞれ大きく表示することができる。また、図１０上のルート表示欄１１及びメッセージ表示欄１３双方の画面領域を、利用者が目的地までの誘導を希望していないときには共にメッセージ表示欄１３として用い、利用者が目的地までの誘導を希望しておりかつメッセージを受信していないときにはルート表示欄１１として用い、利用者が目的地までの誘導を希望しておりかつメッセージを受信したときには図１０に示される形態で用いることも可能である。いずれの使用方法においても、各表示欄１１～１３をその必要性に応じて拡張・縮小・廃止しているため、画面の全体サイズを小さくすることが可能になり、携帯端末１０の消費電力低減や小形化に貢献できる。

【００５５】メッセージを表示した後、携帯端末１０は、受信した無線機送信フレーム中の“返答要求有無フラグ”が返答要求“無”を示す値であれば図９の動作を終了し（２１２）、逆に返答要求“有”を示す値である場合には確認待ち動作に移行する。すなわち、携帯端末１０は、確認釦たる押し釦１４を利用者が操作するまで（２１４）、所定時間（例えば数分）を限度として待ち（２１６）、その間に利用者が確認釦を操作したら“確認有無フラグ”を確認“有”の値にセットした上で（２１８）携帯端末送信フレームを送信する（２２０）。ステップ２２０における送信も、送信先の無線機２０又はこれと同一無線周波数の無線機２０からの送信が停止しているときに実行する。

【００５６】所定時間の経過にもかかわらず利用者が確認釦を操作しないときには、携帯端末１０は、“確認有無フラグ”を確認“無”の値にセットし（２２２）携帯端末送信フレームを送信した上で（２２０）、再度ステップ２１４以降の確認待ち動作に移行する（２２４）。このように確認“無”でもその旨の携帯端末送信フレームを送信するようにしているため、管理コンピュータ４０側ではメッセージ受領を確認していない利用者を検出・追跡することができ、場合によっては人手による連絡をつけることも可能になる。

【００５７】確認待ち動作の繰返し実行により最終的に確認が得られたとき、すなわち“確認有無フラグ”が確認“有”の値を有する携帯端末送信フレームを送信した後には（２２４）、携帯端末１０は、表示しているメッセージを消去すると共に（２２６）図９の動作を終了する。

【００５８】（６）携帯端末の動作…現在地判定

携帯端末１０においてルートを表示するためには、ルート情報の生成の基礎となる各種の情報、すなわち現在地情報、目的地情報及び屋内地図情報が必要である。本実施形態では、無線機２０から送信され図３に示される表記に従う“無線機ＩＤ”に基づき、同様の表記に従う“現在地アドレス”を生成し、これを無線機２０を介した返答要求に応じ無線送信すると共にルート決定・表示に使用している。“現在地アドレス”の無線送信に関しては図９に従い説明したため、ここではまず“現在地アドレス”の生成処理に関して説明し、後にルート決定・表示処理に関して説明する。

【００５９】図１１には、携帯端末１０により所定頻度で繰返し実行される現在地判定手順が示されている。携帯端末１０は、本システムにて使用され得るすべての無線周波数Ｆ１～Ｆｍに関し（３００）、監視対象たる無線周波数を逐次変更しながら（３０２）、無線機送信フレームの受信有無（３０４）を監視する（マルチスキャン）。無線機送信フレームを受信できたときには、前述の図９の動作を並列的に又は後に実行する一方で、その無線機送信フレームを搬送した無線周波数とその無線機

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送信フレーム中の“無線機ＩＤ”を互いに対応付けて記憶する（３０６）。携帯端末１０は、このような処理により、現在自分の近傍に位置している無線機２０の無線周波数及び無線機ＩＤを検出している。

【００６０】マルチスキャンにもかかわらず無線機送信フレームを１個も受信できなかった場合（３０８）、携帯端末１０は、何等かの理由で電波が遮蔽されていると見なして現在地判定手順を終了する。この場合、例えば、従前の現在地判定手順で求めた“現在地アドレス”を引き続き使用する。

【００６１】マルチスキャンにて無線機送信フレームの受信を検出できた無線周波数の個数が１個である場合（３０８）、携帯端末１０は、自分の周囲には無線機２０が１個しかないと見なし、その無線機送信フレーム中の“無線機ＩＤ”をそのまま“現在地アドレス”として使用する（３１０）。

【００６２】マルチスキャンにて無線機送信フレームの受信を検出できた無線周波数の個数が２個以上である場合（３０８）、携帯端末１０は、自分の周囲には複数個の無線機２０がある（言い換えれば複数個の無線機２０の電波範囲の重複範囲内に自分が位置している）と見なし、当該複数個の無線機２０に係る複数個の無線機送信フレーム中の“無線機ＩＤ”の重心を求め、これを“現在地アドレス”として使用する（３１２）。図３（ｃ）を例にとると、“無線機ＩＤ”＝“１－３－３－０９－Ｅ”の無線機２０及び“無線機ＩＤ”＝“１－３－３－０９－Ｌ”の無線機２０から無線機送信フレームを受信できる状況下では、両“無線機ＩＤ”の重心である“１－３－３－０９－Ｈ”がその携帯端末１０の“現在地アドレス”となる。このように、電波範囲の重複を利用することにより、無線機２０の配置間隔よりも良い分解能で、現在地アドレスを決定できる。

【００６３】但し、実際には、“現在地アドレス”の演算に使用し得ない“無線機ＩＤ”もある。例えば、利用者が階段脇を通り掛かったときには、利用者の現在階に配置されている無線機２０から無線機送信フレームを受信できるばかりでなく、その上又は下の階に配置されている無線機２０からも階段の吹抜け空間や踊り場空間を介して無線機送信フレームを受信できる。このような状況下で、上又は下の階に配置されている無線機２０の“無線機ＩＤ”を“現在地アドレス”の演算に使用してしまうと、利用者が単に階段脇を通り掛かったのみであり実際は他の階への移動を意図してはいないときであっても、他の階にあるアドレスが“現在地アドレス”とされることになりかねない。これは、ルート決定・表示に際して支障となるため、本実施形態では、所定条件を満たす“無線機ＩＤ”を次のような手順で“現在地アドレス”の演算から除外している。

【００６４】マルチスキャンにて無線機送信フレームの受信を検出できた無線周波数の個数が２個以上である場合（３０８）、携帯端末１０は、まず、それらの無線機送信フレーム中の“無線機ＩＤ”を参照し、当該複数の無線機送信フレームの送信元たる複数の無線機２０の所属階を判定する。当該複数の無線機２０がいずれも同じ階に属している場合（３１４）、携帯端末１０は、当該複数の無線機２０に係る複数の“無線機ＩＤ”を全て採用し、ステップ３１２を実行する（３１６）。逆に、当該複数の無線機２０の所属階が複数の階に分布している場合（３１４）、携帯端末１０は、受信できた無線機送信フレームの送元たる無線機２０の個数が最も多い階、すなわち最多所属階を求め（３１８）、最多所属階に属する無線機２０の“無線機ＩＤ”を採用し（３２０）、採用した個数が１個であればステップ３１０を、２個以上であればステップ３１２を、それぞれ実行する（３１６）。これにより、間違いなく利用者を案内できかつ利用者の現在地を管理コンピュータ４０が収集できるようになる。

【００６５】但し、最多所属階が複数個ある場合（３２２）、そのうち従前の“現在地アドレス”が属していた階（従前の“現在地アドレス”が属していた階が最多所属階でない場合には、これに最も近い階）に属する無線機２０の“無線機ＩＤ”を採用し（３２４）、採用した個数が１個であればステップ３１０を、２個以上であればステップ３１２を、それぞれ実行する（３１６）。

【００６６】（７）携帯端末の動作…ルート決定

図１２には、図１１に示される手順により決定された各携帯端末１０の現在地を利用してルートを求めるルート決定手順が示されている。この手順は、各携帯端末１０により所定頻度で繰り返し実行される。

【００６７】本実施形態では、まず、無線機送信フレーム中の“呼出し先アドレス”に何等かのアドレスが設定されているか否かが携帯端末１０により判定される（４００）。“呼出し先アドレス”に何等かのアドレスが設定されていると判定したときには、携帯端末１０は、管理コンピュータ４０がその携帯端末１０の利用者をそのアドレスに呼び寄せたがっていると見なし、図１１の手順にて決定された現在地アドレス、ステップ４００にて判定検出した“呼出し先アドレス”及びＩＣカード１６上の屋内地図情報に基づき、現在地から呼出し先までのルートを求め（４０２）、現在地、目的地、ルート、ルート周辺の目印たる設備等を図１３に示されるような形でルート表示欄１１上に表示させる（４０４）。ルートを求める際には、壁の存在、通路の一方通行規制等を考慮し、これらの制約条件を満たしながらも最も道程が短いルートを算出する。これにより、空港ビルを全く又はほとんど利用したことがない不案内な利用者でも、誘導を受けながら、呼出し先まで躊躇せずに最短時間でたどりつくことができる。

【００６８】但し、呼出し先が目近にある場合やその利用者が空港ビル内の地理を熟知している場合のように利

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用者が誘導を希望しないこともあることから、ステップ４００からステップ４０２に移行するのに先立って、携帯端末１０は、図１４に示されるように「ご案内致しましょうか」等の文字列又は記号列をメッセージ表示欄１３上に表示させると共に、いずれか２個の押し釦１４に誘導可否入力釦機能を割り当てその押し釦１４の横項目表示欄１２上に「する」「しない」等と表示させる（４０６）。携帯端末１０は、利用者が「する」の押し釦１４を操作したときにはステップ４０２へ移行し、「しない」の押し釦１４を操作したときには図１２の手順を終了する。

【００６９】なお、図１４ではルート表示欄１１上にルートが表示されていないが、すでに決定済みのルートがある場合にはそのルートを引き続き表示しておいてもよい。また、ルート表示欄１１とメッセージ表示欄１３の相対関係に関しては、ステップ２１０に関して前述した通り変形可能である。

【００７０】“呼出し先アドレス”に何もアドレスが設定されていないと判定したときには（４００）、携帯端末１０は、利用者による目的地の入力を待つ（４０８）。携帯端末１０は、利用者による目的地の入力を促すため、図１５最上段に示されるように、「目的地をご入力下さい」等の文字列又は記号列をメッセージ表示欄１３上に表示させ、同時に、目的地の候補をそれぞれいずれかの押し釦１４に対応するよう項目表示欄１２上に列記表示させその押し釦１４にその候補を選択する機能を割り当てる。但し、少なくとも１個の押し釦１４に関しては、入力終了釦の機能を割り当てる。

【００７１】本実施形態における利用者による目的地の入力は階層的な構造による入力であり、目的地の大きな分類乃至特徴から細かな分類乃至特徴へと順に利用者が選択指定していく方法を採用している。例えば、入力の最初の段階では項目表示欄１２に「搭乗口」「待合」その他の大まかな分類が表示され、利用者がその中の例えば「レストラン」に対応する押し釦１４を操作すると「現在の階」等さらに細かな分類が表示される。図１５の例では、設備の分類→所属階→特徴（ここではレストランの種別）→設備の名称の順での階層的目的地入力が行われている。また、利用者は、目的地入力の間常に設けられている「入力終了」の押し釦１４を操作することにより、任意の入力段階で目的地入力を終了することができる。利用者が目的地を大まかにでも選択することなしに目的地入力終了を選択したときには、携帯端末１０は図１２の動作を終了する。

【００７２】なお、図１５上から２段目の「階」入力画面に項目「現在の階」があるのは、利用者自身が現在階を知っていない場合に対処するためである。また、現在表示されている項目の選択を避け次の画面にて項目を選択できるよう、次の分類へのスキップを指令する機能をいずれかの押し釦１４に割り当てておいてもよい。

【００７３】利用者が目的地を大まかにでも選択した上で目的地入力終了を選択したときには、携帯端末１０は、当該選択の結果から目的地のアドレスを特定できるか否かを判断し（４１０）、特定できると判断した場合にはそのままステップ４０２に移行しルート決定及び表示を実行する。例えば、利用者が目的地たるレストランの名称まで選択した上で目的地入力終了を選択したときには、図４（ｂ）に示されているカードデータを利用して目的地のアドレスを決定できると判断する。従って、利用者は、項目表示欄１２の表示を読みながら押し釦１４を数回操作するだけで、効率よく、目的地を入力することができる。

【００７４】逆に、利用者がレストランを選択しただけでその所属階も種別も名称も選択していないとき等には、それだけでは目的地のアドレスを特定できないと判断する。特定できないと判断した場合、携帯端末１０は、選択入力されている部分的な目的地条件に合致する目的地候補をＩＣカード１６上のカードデータから検索し（４１２）、検索により得られた目的地候補までの道程を壁の存在、一方通行規制等を考慮しながらそれぞれ求め（４１４）、求めた道程が最も短い目的地候補のアドレスを目的地アドレスとして選択し（４１６）、その上でステップ４０２に移行する。

【００７５】例えば、利用者がレストランを選択しただけのときには、空港ビル内のレストランのうち利用者の現在地に最も近い（最も道程が短く従って最も早くたどり着ける）レストランが、携帯端末１０により目的地に自動設定される。従って、最も近いところにある設備の利用を望んでいる利用者にとっては、目的地の細かな選択指定操作を省略できるため、至便性が高い。例えば“トイレを探しているとき”や“手っ取り早く食事ができればどの様な食事でもよいとき”には、この機能は特に有効である。

【００７６】さらに、ステップ４１２において目的地候補を検索するときに、それまでに利用者が選択指定している目的地条件に応じ、検索条件に予め制約を設けるようにすれば、ステップ４１２～４１６の処理を高速化し早期にルートを決定することが可能である。また、この制約処理は、空港ビルの福祉向上にも役立つ。例えば、利用者が目的地を“トイレ”の段階まで選択指定しただけで一般用かそれとも障害者用かを指定していないときには、図４（ａ）に示されるカードデータのうち身体障害者用に確保しておくべき障害者用トイレを、ステップ４１２における検索対象から除外することにより、障害者用トイレしか利用できない身体障害者をトイレ混雑等の不便から保護することができる。

【００７７】（８）携帯端末の動作…ルート外れリカバリ

図１６には、携帯端末１０により所定頻度で繰り返し実行されるルート外れリカバリ手順が示されている。この

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手順は、携帯端末１０のルート表示欄１１上に表示されているルートから利用者が大きく外れた場合にもその利用者を目的地まで誘導できるようにするための手順であり、図１２に示される手順により既にルートが決定されている場合に実行される（５００）。

【００７８】ルート外れリカバリ手順においては、ステップ３０６にて記憶・収集済みの無線周波数・無線ＩＤ対、ステップ３１０又は３１２にて求めた現在地アドレス、及び図１２の手順にて決定済のルートに基づき、その携帯端末１０がこれから受信するであろう無線機送信フレームの無線周波数及び無線機ＩＤを少なくとも１タイミング分予測する（５０２）。すなわち、携帯端末１０は、まず、ステップ３１０又は３１２にて求めた現在地アドレスを始点として決定済のルートに沿い利用者が移動した後の携帯端末１０のアドレス（移動後の現在地アドレス）を予測し、次に、その移動後の現在地アドレスの近傍にある無線機２０が使用している無線周波数及び無線機ＩＤを、ステップ３０６にて収集した情報から決定することにより、近い将来受信できる無線周波数及び無線機ＩＤを予測する。

【００７９】携帯端末１０は、受信した無線機送信フレームの無線周波数及び無線機ＩＤを予測と比較する（５０４）。携帯端末１０は、予測通りの無線周波数及び無線機ＩＤを検出したときには、現在地、目的地及びルートの表示を継続する（５０６～５１０）。すなわち、現在地の所属ページに変化がないときには（５０６）、携帯端末１０は、現在地を示す文字又は記号（図１３の例では黒丸）の位置を変化させる（５０８）。これにより、利用者はルートに沿った現在地変化をルート表示欄１１上で目で追うことができる。また現在地の所属ページに変化があるときには（５０６）、携帯端末１０は、後述の画面自動拡大を含めた処理を実行する（５１０）。

【００８０】逆に、予測に違えた無線周波数及び無線機ＩＤを検出したときには（５０４）、携帯端末１０は、図１７に示されるようにルート外れを利用者に知らせ再誘導可否を問う「目的地までのルートから外れています。ご案内致しましょうか」等のメッセージを、メッセージ表示欄１３上に表示させる（５１２）。携帯端末１０は、ルート外れ／再誘導可否表示の際には、いずれか２個の押し釦１４に「する」「しない」等の選択機能を割り当て、項目表示欄１２上にはその押し釦１４と並ぶよう「する」「しない」等の文字列又は記号列を表示させる。

【００８１】利用者が「しない」を選択するための押し釦１４を操作したときには、携帯端末１０は再誘導不要であると判定し（５１４）、ステップ５０６に移行する。この場合には、ルート表示欄１１上に、引き続き図１７のような映像が表示される。利用者は、この映像による支援を受け、ルートに復帰することができる。ルート復帰によりステップ５０４にて予測との一致が検出されるに至ったときには、ルート外れ／再誘導可否表示は消去される（５２０）。なお、ルート外れ／再誘導可否表示を行っているときに（５２２）ステップ５０２を省略しているのは、前回ステップ５０２を実行したときに予測した情報をルート復帰直後まで保持しその時点で利用することを可能にするためである。

【００８２】自力でルートに復帰できない場合には、利用者は図１７の状態で「する」を選択するための押し釦１４を操作すればよい。これに応じ（５１４）、携帯端末１０は、現在地から目的地に至るルートをステップ４０２と同様の手順で再決定し（５１６）、ルート外れ／再誘導可否表示を消去した上で（５１８）、ステップ５０６に移行する。ステップ５０６では現在地の変化のみならずルートの変化も判定検出しており、ルート再作成後のようにルートが変化している場合はステップ５１０が実行される。従って、ルートに自力復帰できないときでも、利用者は、現在地から目的地へ改めてルート誘導を受けることができる。

【００８３】（９）携帯端末の動作…表示制御

前述のステップ４０４及び５１０は、現在地、目的地、ルート等をルート表示欄１１上に表示させる機能を提供している。携帯端末１０は、この機能を、図１８に示される現在地・目的地・ルート表示手順を実行することにより実現している。また、複数の階を有する空港ビルにおいては現在地から目的地に至るルートが複数の階にまたがることが往々にしてあるため、本実施形態では、そのようなルートを表示する際にもルート表示欄１１上の映像から利用者が直観的にルートを把握できるように、表示方法を工夫している。

【００８４】本実施形態では、携帯端末１０は、まず、現在地から目的地に至るルートがよぎるページを、表示候補として選び出す（６００）。後に説明するように、表示候補として選び出されたページは、現在地、目的地、ルート、ルート近傍の目立つ設備等と共に、ルート表示欄１１による表示の対象となる。但し、ルート外れ発生時のように現在地のアドレスがこれらのページに属していないことがあるから、ステップ６００では現在地アドレスの所属ページも併せて表示候補として選び出す。

【００８５】携帯端末１０は、次に、選び出した表示候補が全て同じ階に属しているか否かを判定する（６０２）。属していると判定したときには、携帯端末１０は、表示候補全てを包含する最小の四角形を求め、この四角形に属する全てのページを表示候補として選び出す（６０４）。例えば、ルートが図１９（ａ）に示されるように横方向４ページ縦方向４ページの広がりを有している場合には、この４ページ×４ページの正方形に属する合計１６ページが、表示候補となる。携帯端末１０は、表示候補にて構成される四角形の長辺がルート表示

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欄１１におさまるよう表示倍率＝ルート表示欄寸法／表示候補群の実寸を決定し（６０６）、決定した表示倍率に従いかつ現在地や目的地を示す記号又は文字やルートを示す線と重ねて、ルート表示欄１１上に表示させる（６０８）。その際には、携帯端末１０は、目的地までの距離や所要時間を併せて表示させる。また、ルート近傍にある設備を示す記号又は文字も、表示の対象とする。但し、ルート近傍にある全ての設備を表示するのは画面の見易さの点でも処理の負担の点でも好ましくないから、携帯端末１０は、ステップ６０８に先立ち、表示倍率に応じ、目立つ設備のみを選び出す（６１０）。目立つ設備のみを選択する処理は、カードデータ上のブロック数情報（図４（ａ）及び（ｂ）参照）を利用し、ブロック数の大きな設備を選び出す、という手順で行う。

【００８６】ここで、ステップ６０４までに選び出された一群の表示候補をそのまま表示したのでは、ルート表示欄１１の画面に空きが生じる可能性がある。例えば、ルート表示欄１１が常に正方形となるよう設計された携帯端末１０を考える。このような携帯端末１０を利用してルート表示を実行する際には、表示候補群により構成される四角形が正方形でなくてはならない。従って、ステップ６０４にて求められた四角形が正方形ではなく長方形である場合、縦横均等な倍率にて表示を行うと、その長方形の短辺側に欠けが生じる。そこで、携帯端末１０は、ステップ６０６実行後、表示候補群四角形がルート表示欄１１の画面四角形に適合しているか否か、すなわち両四角形が同一の形状（縦横比）を有しているか否かを判定し（６１２）、同一の形状を有している場合にのみ、ステップ６０４までに求めた表示候補群のみによる表示を実行し、同一の形状を有していない場合には不足辺（ルート表示欄１１の画面四角形に対し表示候補群四角形が不足している部分）側へ表示候補を補填し、表示候補群四角形がルート表示欄１１の画面四角形と同一の形状となるように調整する。なお、項目表示欄１２やメッセージ表示欄の拡大縮小により、表示候補群四角形とルート表示欄１１の画面四角形の形状の相違を補うようにしてもよい。

【００８７】不足辺側へ表示候補を補填する際には、携帯端末１０は、まず不足辺側に補うべきページ数を、ステップ６０４にて求めた四角形の寸法及びルート表示欄１１の寸法に基づき演算する（６１４）。不足辺側に補うべきページ数から見てそれまでに踏破されたルートに係るページ（通過ページ）を表示可能である場合には（６１６）、携帯端末１０は、通過ページを表示候補として選び出す（６１８）。それでもなお表示候補が不足する場合には（６２０）、携帯端末１０は、表示候補に隣接するページの中から新たな表示候補を選び出す（６２２）。携帯端末１０は、通過ページを表示可能でない場合もステップ６２２を実行する。ステップ６２０にて不足していないと判断したときやステップ６２２の実行を終えたとき、携帯端末１０の動作は、ステップ６１０に移行する。

【００８８】このようにして実行される表示候補補填処理を概念的に表すと、図１９のようになる。まず、図１９（ａ）の例は、ステップ６１２にて“適合している”と判定される場合の例であり、この場合には表示候補の補填は行われない。次に、図１９（ｂ）～（ｄ）の例は、いずれも、ステップ６１２にて“適合していない”と判定される場合の例である。なかでも図１９（ｂ）の例は通過ページのみにて補填する場合（ステップ６１６→６１８→６２０→６１０）の、図１９（ｃ）は通過ページ以外のページにて補填する場合（ステップ６１６→６２２→６１０）の、図１９（ｄ）は通過ページ及びそれ以外のページ双方にて補填する場合（ステップ６１６→６１８→６２０→６２２→６１０）の、例を示している。

【００８９】このように、本実施形態においては、ルートの全体が必ず単一画面上に表示されるよう、またルートが最大表示されるよう、図２０（ａ）に示されるように現在地の変化に伴い表示倍率を変化させているため、現在地の変化によらず常に見易いルート表示画面が得られ、高い使用性を実現できる。また、上述のように目印設備を併せて表示しているため、単に現在地、目的地及びルートを表示する場合に比べ、利用者を目的地に誘導しやすい。すなわち、利用者にとっては、例えば「目的地に行くは、○○レストランの隣を通り、エスカレータを上って、××レストランの方へ歩めばよい」等のようにルートを解釈する余地ができるから、より有効なルート誘導となる。さらに、目印設備を選ぶときブロック数を目安にしているため、目的地への接近に伴い徐々により小規模な設備が表示され始めることとなるから、利用者を正確に目的地に誘導できる。また、ルート表示欄１１の画面に欠けが生じないため、空港ビルの地理に関し利用者に可能な限り多くの情報を提供することができる。さらに、表示候補補填の際に通過ページを優先的に補填に使用し既に踏破されたルートの少なくとも一部を併せて表示しているため、ルート表示がさらに見易くなり、使用性が高まる。

【００９０】また、ステップ６０２にてルートが複数の階にまたがっていると判定された場合、ステップ６０４に代えステップ６２４～６２８が実行される。ステップ６２４では、ルートがまたがっている全ての階それぞれについて、ステップ６０４と同様にして表示候補群四角形が求められる。続くステップ６２６では、同一の階間移動装置（エレベータ、エスカレータ、階段等）がルート表示欄１１上で同一列（同一行でも構わない）上に並ぶよう、各階について求められた表示候補群四角形同士が相互に位置決めされる。

【００９１】例えば、第１のエスカレータを使用して１階から２階に上り、続いて第２のエスカレータを使用し

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て２階から３階に上るルートを考える。この場合、第１のエスカレータは、１階に係る表示候補群四角形の中にも、また２階に係る表示候補群四角形の中にも、含まれている。従って、画面の見易さを確保するためには、１階に係る表示候補群四角形の中の第１のエスカレータの位置と、２階に係る表示候補群四角形の中の第１のエスカレータの位置とを、ルート表示欄１１上で位置揃えするのが好ましい。本実施形態では、ルート表示欄１１上の縦位置を揃えるようにしている。なお、第２のエスカレータに関しても同様である。

【００９２】続くステップ６２８では、図２１（ｂ）に示されるように、各階に係る表示候補群四角形が合成される。このようにすれば、ルートが複数回にまたがる場合でも、図２０（ｂ）に示されるように、図２０（ａ）と同様の効果を得ることができる。加えて、利用者は、複数階にまたがるルートを常に一覧でき、かつ、直観的に把握できるから、複数の階を有する空港ビルにおいて利用者を効率的かつ確実に案内できる。

【００９３】なお、ルート表示欄１１上に表示する際には、各階表示候補群四角形の境界に太線等を付すのが好ましい。また、例えば１階から２階を経て１階に戻るようなルートを表示する際には、２階に上る前の部分ルートと、２階から降りた後の部分ルートを、単一の表示候補群四角形にて表示してもよいし、別の表示候補群四角形にて表示してもよい。

【００９４】

【発明の効果】本発明の第１の構成によれば、複数の階を有する建物の屋内空間に複数の無線機を分散配置する一方で屋内空間を移動する利用者に無線機との無線通信用の携帯端末を携帯させるようにしたため、屋外のインフラストラクチャを利用したりまた屋外に新たなインフラストラクチャを設ける必要がなく、屋内で比較的容易にルート案内を実施できる。また、本構成によれば、携帯端末との無線通信可能範囲が重複する無線機同士の無線周波数が互いに異なるよう、各無線機を配置するようにしたため、各携帯端末は、無線機位置情報同士の衝突なしに、常にいずれかの無線機から無線機位置情報を受信でき、従って屋内の利用者に対し常にルート情報を提供可能になる。さらに、受信した無線機位置情報に基づきルート情報を生成する際、その携帯端末が複数の無線機と無線通信可能な位置にあれば、当該複数の無線機からの無線機位置情報をいずれも利用できるから、現在地情報の精度・分解能は高く、従ってルート情報もより正確になる。また、本構成によれば、ルートの各階部分が含まれる各階地図を単一画面上に並べて可視表示するようにしたため、利用者が複数階にまたがるルートを常に一覧できると同時に、同一の階間移動装置（例えばエレベータ、エスカレータ、階段等）の行方向又は列方向の位置が揃うよう各階位置の表示位置を決めるようにしたため、利用者が表示画面から直観的に現在地、目的地、ルート等の相互関係を見て取ることができる。従って、複数の階を有する建物における利用者の案内を効率化及び確実化できる。

【００９５】本発明の第２の構成によれば、目的地を階層的に入力する手段を設けたため、最少の入力操作にて目的地を設定可能になり、利用者を行きたいところへ迅速に案内可能になる。

【００９６】本発明の第３の構成によれば、呼出し先情報の無線送信にて各携帯端末に呼出し先を設定しまたメッセージを送信しているため、必要に応じ利用者を所定の又は特定の場所へ呼び出しまたメッセージを伝達することが可能になる。

【００９７】本発明の第４の構成によれば、各階毎に受信無線信号の多寡を判定し多数階からの無線機位置情報を現在地決定に利用しているため、例えば、利用者が階段脇に立ち止まったときや通り過ぎたとき等のように複数の階から同時に無線機位置情報を受信できるような状況でも、間違いなく利用者を案内できる。

【００９８】本発明の第５の構成によれば、トイレ、レストラン、階間移動装置等、利用者が頻繁に利用するであろう設備又は利用者が利用する確率の高い設備に関する情報を、外部記憶媒体上にデータベース化し、これを地図情報として利用しているため、地図情報の情報量が少なくて済み、従って携帯端末が小型簡素になる。

【００９９】本発明の第６の構成によれば、携帯端末の現在地がルートから所定程度以上外れた場合にその旨を利用者に報知するようにしたため、案内されたルートを利用者が見失った場合でも利用者が自力でリカバリする機会を与えることができ、利用者を目的地までより確実かつ迅速に案内できる。また、本発明の第７の構成によれば、携帯端末の現在地がルートから所定程度以上外れた場合にルート情報を再度生成するようにしたため、案内されたルートを利用者が見失っておりかつその利用者が自力でリカバリできない場合でもリカバリ可能になり、利用者を目的地までより確実かつ迅速に案内できる。さらに、携帯端末の現在地がルートから所定程度以上外れたか否かの判定は、その時点で無線機から受信できる無線周波数や無線機位置情報が予測から外れたか否かの判定等により、格別の負荷なしに実現できる。

【０１００】本発明の第８の構成によれば、ルートの全体が単一画面上に表示されかつ当該ルートが最大表示されるよう現在地の変化に応じ表示倍率を変化させるようにしたため、現在地の変化によらず常に見易いルート表示を実現でき、これにより使用性を高めることができる。本発明の第９の構成によれば、さらに、ルート及びその周辺のエリアの地図を表示するのみでは画面の表示可能領域に対する実表示領域に不足が生じる場合に、既に踏破されたルートの少なくとも一部を含むエリアの地図を優先的に用いて表示を補填するようにしたため、さらに見易いルート表示を実現でき、より使用性を高める

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ことができる。

【０１０１】本発明の第１０の構成によれば、携帯端末から無線機に現在地情報を無線送信し、この現在地情報をシステムにて収集するようにしたため、利用者の動向を簡便に管理・把握できる。本発明の第１１の構成によれば、さらに、無線機からの返答要求信号に応じ携帯端末が現在地情報を無線送信するようにしたため、システムが随時利用者の動向を知ることができ、第３の構成に係る呼出し、メッセージ送信等をより好適に実行可能になる。

【０１０２】そして、本発明の第１２の構成によれば、利用者の身体に当該携帯端末を着脱可能に固定するベルトを携帯端末に設けたため、利用者が携帯しやすい携帯端末を実現できる。

【０１０３】

【補遺】なお、本発明は次のような構成として把握することもできる。

【０１０４】（１）本発明の第１３の構成に係るルート案内方法は、携帯端末との無線通信可能範囲が互いに重複する無線機同士の無線周波数が互いに異なるよう、複数の階を有する建物の屋内空間に分散配置された複数の無線機から、それぞれ、その位置を示す無線機位置情報を無線送信するステップと、上記屋内空間を移動する利用者により携帯された上記携帯端末が上記無線機位置情報を無線受信するステップと、当該無線機位置情報を受信した携帯端末が当該無線機位置情報に基づき当該携帯端末の現在地を示す現在地情報を生成するステップと、当該現在地情報、目的地を示す目的地情報及び上記建物の屋内地図を示す地図情報に基づき、現在地から目的地に至るルートを示すルート情報を上記携帯端末が生成するステップと、上記ルートの各階部分が含まれる各階地図を、上記ルート情報に基づき、かつ、同一階間移動装置の行方向又は列方向の位置が揃うよう単一画面上に並べて、上記携帯端末が可視表示するステップと、を有し、複数階に亘る屋内空間にて上記携帯端末の利用者を目的地まで案内することを特徴とする。本構成によれば、第１の構成と同様の作用効果が得られる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１０５】（２）本発明の第１４の構成に係る携帯端末は、携帯端末との無線通信可能範囲が互いに重複する無線機同士の無線周波数が互いに異なるよう、複数の階を有する建物の屋内空間に分散配置された複数の無線機から、その位置を示す無線機位置情報を無線受信する手段と、当該無線機位置情報に基づき当該携帯端末の現在地を示す現在地情報を生成する手段と、当該現在地情報、目的地を示す目的地情報及び上記建物の屋内地図を示す地図情報に基づき、現在地から目的地に至るルートを示すルート情報を生成する手段と、上記ルートの各階部分が含まれる各階地図を、上記ルート情報に基づき、かつ、同一階間移動装置の行方向又は列方向の位置が揃うよう単一画面上に並べて、可視表示する手段と、を備え、複数階に亘る屋内空間にて上記携帯端末の利用者を目的地まで案内することを特徴とする。本構成によれば、第１又は第１３の構成に適する携帯端末を提供できる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１０６】（３）本発明の第１５の構成に係る利用者動向管理方法は、携帯端末との無線通信可能範囲が互いに重複する無線機同士の無線周波数が互いに異なるよう、屋内空間に分散配置された複数の無線機により、当該屋内空間を移動する利用者により携帯される上記携帯端末から、その携帯端末の現在地に関する現在地情報を無線受信するステップと、上記無線機により無線受信された上記現在地情報を収集することにより管理コンピュータが上記利用者の動向を管理するステップと、を有することを特徴とする。本構成によれば、利用者の動向を常に又は定期的に把握することができる。特に、管理コンピュータ又はその下位にある中間コントローラの制御の下に無線機から返答要求信号を無線送信し、これの無線受信に応じて携帯端末が現在地情報を無線送信するようにすれば、システムが随時利用者の動向を知ることができ、第３の構成に係る呼出し、メッセージ送信等をより好適に実行可能になる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１０７】（４）本発明の第１６の構成に係る目的地設定方法は、目的地の候補の分類を可視表示する第１ステップと、可操作部材の操作により利用者がいずれかの分類を選択する第２ステップと、選択された分類に属する目的地の候補をさらに分類して第１及び第２ステップを実行する第３ステップと、利用者による可操作部材の操作に応じ第１乃至第３ステップの実行を終了させる第４ステップと、第４ステップの実行後、それまでに選択された階層的な分類に従い目的地を決定する第５ステップと、を有し、屋内空間を移動する上記利用者により携帯された携帯端末において実行されることを特徴とする。本構成によれば、目的地を階層的に入力できるため、最少の入力操作にて目的地を設定でき、利用者を行きたいところへ迅速に案内可能になる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１０８】（５）本発明の第１７の構成に係る利用者呼出し方法は、携帯端末との無線通信可能範囲が互いに重複する無線機同士の無線周波数が互いに異なるよう、屋内空間に分散配置された複数の無線機から、上記屋内空間を移動する利用者により携帯される上記携帯端末に対し、その携帯端末の利用者の呼出し先を示す呼出し先情報を無線送信するステップと、上記無線機から上記呼出し先情報を無線受信した携帯端末が、その携帯端末の現在地を示す現在地情報、上記呼出し先情報及び上記建

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物の屋内地図を示す地図情報に基づき、目的地から呼び出し先に至るルートを示すルート情報を生成するステップと、生成したルート情報を利用者に提供するステップと、を有することを特徴とする。本構成によれば、呼出し先情報の無線送信にて各携帯端末に目的地（呼出し先）を設定しているため、必要に応じ利用者を所定の又は特定の場所へ呼び出すことが可能になる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１０９】（６）本発明の第１８の構成に係るメッセージ送信方法は、携帯端末との無線通信可能範囲が互いに重複する無線機同士の無線周波数が互いに異なるよう、屋内空間に分散配置された複数の無線機から、上記屋内空間を移動する利用者により携帯される上記携帯端末に対し、その携帯端末の利用者に伝達すべきメッセージを示すメッセージ情報を無線送信するステップと、上記無線機から上記メッセージ情報を無線受信した携帯端末が、当該メッセージ情報に基づき上記メッセージを可視表示するステップと、を有することを特徴とする。本構成によれば、利用者に対し無線機側から随時メッセージを伝達可能になる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１１０】（７）本発明の第１９の構成に係る現在地決定方法は、携帯端末との無線通信可能範囲が互いに重複する無線機同士の無線周波数が互いに異なるよう、複数の階を有する建物の屋内空間に分散配置された複数の無線機から、その位置を示す無線機位置情報を無線送信するステップと、上記屋内空間を移動する利用者により携帯された上記携帯端末が上記無線機位置情報を無線受信するステップと、当該無線機位置情報を無線受信した携帯端末が、相異なる階に配置されている複数の無線機からそれぞれ無線機位置情報を無線受信した場合に、当該無線機位置情報を無線送信した無線機の各階毎個数を判定するステップと、当該個数が他の階に比べ多い階に配置されている無線機からの無線機位置情報に基づき携帯端末がその現在地を示す現在地情報を生成するステップと、生成した現在地情報又はこれに基づき生成されるルート情報を利用者に提供するステップと、を有することを特徴とする。本構成によれば、各階毎に受信無線信号の多寡を判定し多数階からの無線機位置情報を現在地決定に利用しているため、例えば、利用者が階段脇に立ち止まったときや通り過ぎたとき等のように複数の階から同時に無線機位置情報を受信できるような状況でも、間違いなく利用者を案内できる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１１１】（８）本発明の第２０の構成に係るルート外れリカバリ方法は、屋内空間を移動する利用者に携帯される携帯端末の現在地が、予め設定されているルートから所定程度以上外れた場合に、ルートから外れた旨を当該携帯端末の利用者に報知するステップと、利用者からの指示に応じ、その時点での現在地から目的地にいたるルートを示すルート情報を作成し利用者に提供するステップと、を有することを特徴とする。本構成によれば、携帯端末の利用者がルートを見失った場合でもその利用者が自力でリカバリする機会を与えることができ、利用者を目的地までより確実かつ迅速に案内できる。さらに、利用者の求めに応じルート情報を改めて生成するようにしたため、その利用者が自力でリカバリできない場合でもリカバリ可能になり、利用者を目的地までより確実かつ迅速に案内できる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１１２】（９）本発明の第２１の構成に係るルート表示方法は、携帯端末の現在地を示す現在地情報、目的地を示す目的地情報及び当該携帯端末の利用者が移動する屋内空間の地図を示す地図情報に基づき、現在地から目的地に至るルートを示すルート情報を生成するステップと、上記ルートの各階部分が含まれる各階地図を、上記ルート情報に基づき可視表示するステップと、上記ルートの全体が単一画面上に表示されかつ当該ルートが最大表示されるよう、その現在地の変化に応じ表示倍率を変化させるステップと、ルート及びその周辺のエリアを含む地図を表示させたのみでは画面上の表示可能領域に対する実表示領域の不足が生じる場合に、隣接するエリアの地図にて表示を補填するステップと、補填の際、既に踏破されたルートの少なくとも一部を含むエリアの地図を優先的に使用するステップと、を有し、複数の階を有する建物の屋内空間を移動する利用者により携帯された上記携帯端末において実行されることを特徴とする。本構成によれば、ルートの全体が単一画面上に表示されかつ当該ルートが最大表示されるよう現在地の変化に応じ表示倍率を変化させるようにしたため、現在地の変化によらず常に見易いルート表示を実現でき、これにより使用性を高めることができる。さらに、現在地の変化に応じ表示倍率を変化させると表示画面に余剰が生じる場合に、既に踏破されたルートの少なくとも一部を併せて可視表示させるようにしたため、さらに見易いルート表示を実現でき、より使用性を高めることができる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【０１１３】（１０）本発明の第２２の構成に係る携帯端末は、屋内に設けられているトイレ、レストラン、階間移動装置等の設備の位置を示す情報を地図情報として格納する外部記憶手段と、当該携帯端末の現在地を示す現在地情報、目的地を示す目的地情報及び外部記憶手段上の地図情報に基づき、現在地から目的地に至るルートを示すルート情報を可視表示する表示器と、その携帯端末の利用者の身体に当該携帯端末を着脱可能に固定するベルトと、を備えることを特徴とする。本構成によれば、利用者が頻繁に利用するであろう設備又は利用者が利用する確率の高い設備に関する情報を、外部記憶媒体

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上にデータベース化し、これを地図情報として利用しているため、地図情報の情報量が少なくて済み、従って携帯端末が小型簡素になり、携帯に便利になる。その結果、ベルトにて利用者の身体に装着することも可能になる。また、本発明の他の構成を参照して本構成に変形を施すことも可能である。

【図面の簡単な説明】

【図１】　本発明の一実施形態に係る空港ビル内ルート案内システムのブロック図である。

【図２】　携帯端末の外観の一例を示す図である。

【図３】　無線機や携帯端末の位置を示すためのアドレスの構造を示す図であり、特に（ａ）は空港ビルの階構成を、（ｂ）は各階におけるページ配置を、（ｃ）は各ページにおけるアドレス配置並びに無線機の配置、電波範囲及び無線周波数割当てを、それぞれ示す図である。

【図４】　ＩＣカード上にあるカードデータの構造を示す図であり、特に（ａ）はトイレに関するデータの構造を、（ｂ）はレストランに関するデータの構造を、（ｃ）は階間移動装置に関するデータの構造を、それぞれ示す図である。

【図５】　無線インタフェースを示す図であり、特に（ａ）は無線機送信フレームの構成を、（ｂ）は携帯端末送信フレームの構成を、それぞれ示す図である。

【図６】　管理コンピュータ、中間コントローラ、無線機及び携帯端末の間で実行される通信の概略手順を示す図であり、特に中間コントローラによる定時一斉同報の手順を示す図である。

【図７】　管理コンピュータ、中間コントローラ、無線機及び携帯端末の間で実行される通信の概略手順を示す図であり、特に管理コンピュータによるメッセージ送信や呼出しの手順を示す図である。

【図８】　管理コンピュータにより取り扱われる情報を示す図であり、特に（ａ）はフライト情報の構造を、（ｂ）は旅客情報の構造を、それぞれ示す図である。

【図９】　携帯端末により実行される無線機送信フレームへの応答手順を示すフローチャートである。

【図１０】　メッセージ表示画面の一例を示す図である。

【図１１】　携帯端末により実行される現在地判定手順を示すフローチャートである。

【図１２】　携帯端末により実行されるルート決定手順を示すフローチャートである。

【図１３】　誘導表示画面の一例を示す図である。

【図１４】　誘導有無選択画面の一例を示す図である。

【図１５】　目的地入力操作の一例を示す図である。

【図１６】　携帯端末により実行されるルート外れリカバリ手順を示すフローチャートである。

【図１７】　ルート外れ表示画面の一例を示す図である。

【図１８】　携帯端末により実行される現在地・目的地・ルート表示手順を示すフローチャートである。

【図１９】　ルートが複数の階にまたがっていないときのルート表示方法を示す図であり、特に（ａ）は表示候補を補填する必要がない例を、（ｂ）は踏破済みのルートに係るページのみで補填できる例を、（ｃ）はそれ以外のページのみで補填する例を、（ｄ）は双方で補填する例を、それぞれ示す図である。

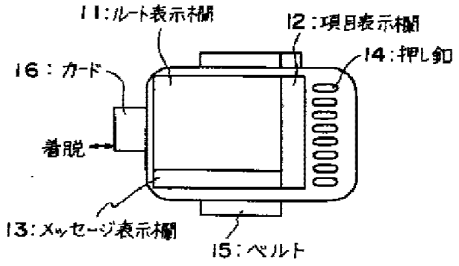
【図２０】　現在地変化に伴う表示倍率自動変更動作を示す図であり、特に（ａ）はルートが複数の階にまたがっていない場合を、（ｂ）はルートが複数の階にまたがっている場合を、それぞれ示す図である。

【図２１】　エスカレータ等の階間移動装置の縦位置を揃える処理を示す図であり、特に（ａ）は位置揃えを、（ｂ）は表示候補群四角形の合成を、それぞれ示す図である。

【符号の説明】

１０　携帯端末、１１　ルート表示欄、１２　項目表示欄、１３　メッセージ表示欄、１４　押し釦、１５　ベルト、１６　ＩＣカード、２０　無線機、３０中間コントローラ、４０　管理コンピュータ、５０　フライトシステム、Ｆ１，Ｆ２，…Ｆｍ　無線周波数。

【図２】



【図５】

(a)無線機から携帯端末に送信するフレーム

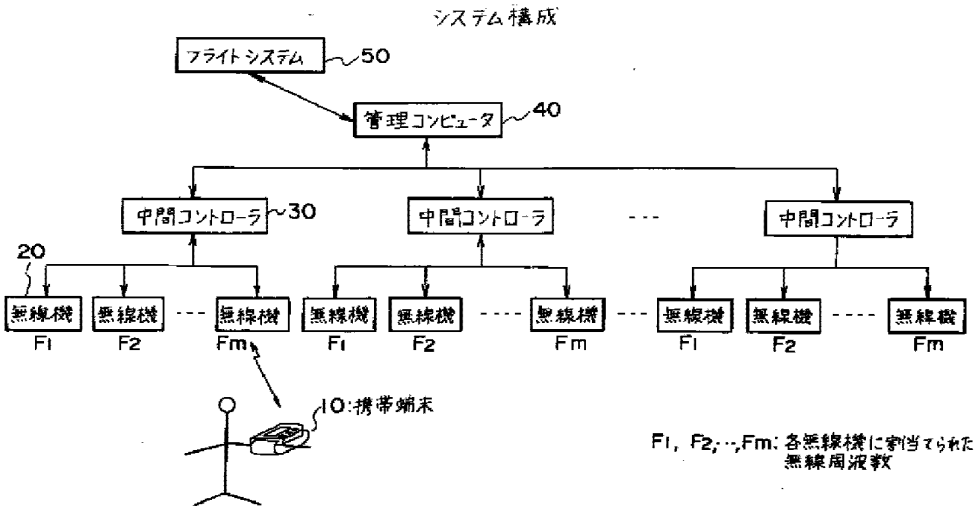
無線機ID	メッセージ有無フラグ	呼出し先アドレス	携帯端末ID	メッセージ	返答要求有無フラグ

(b)携帯端末から無線機に送信するフレーム

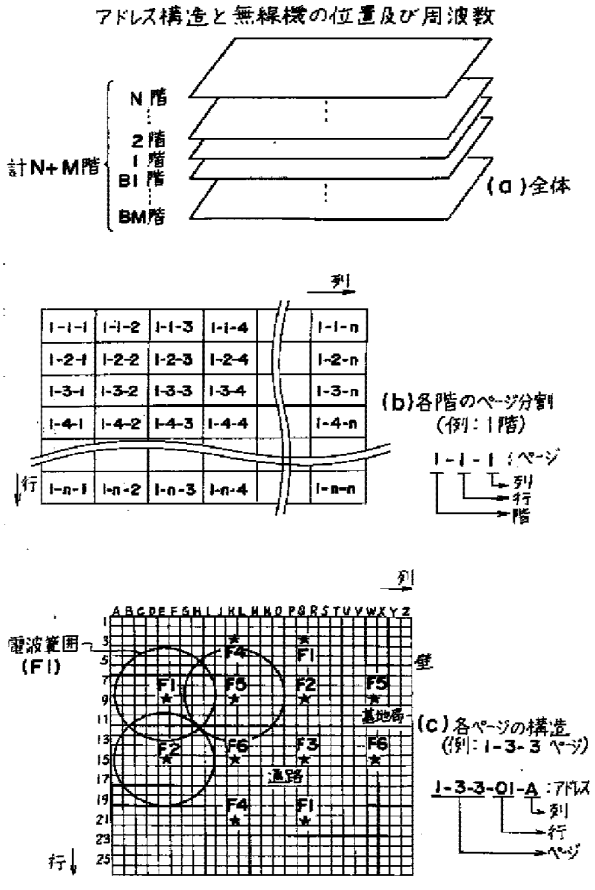
携帯端末ID	確認有無フラグ	現在地アドレス

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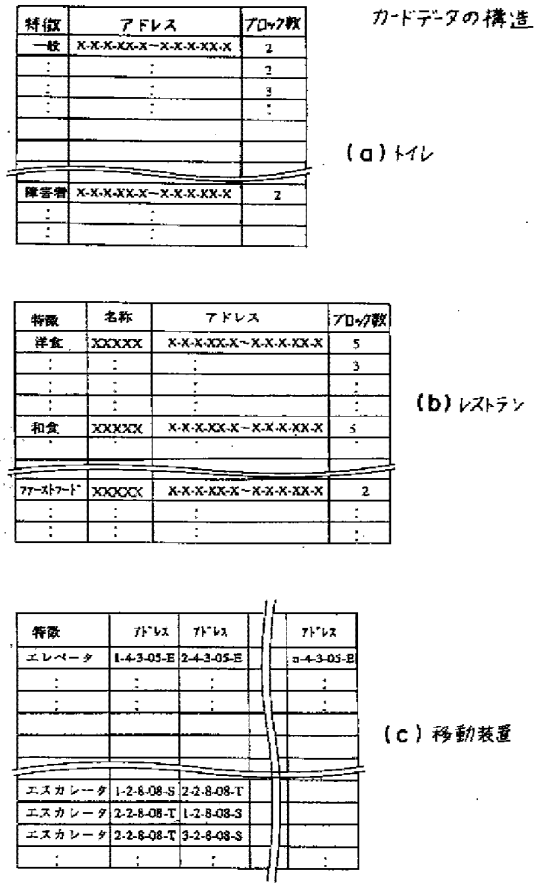
【図１】



【図３】

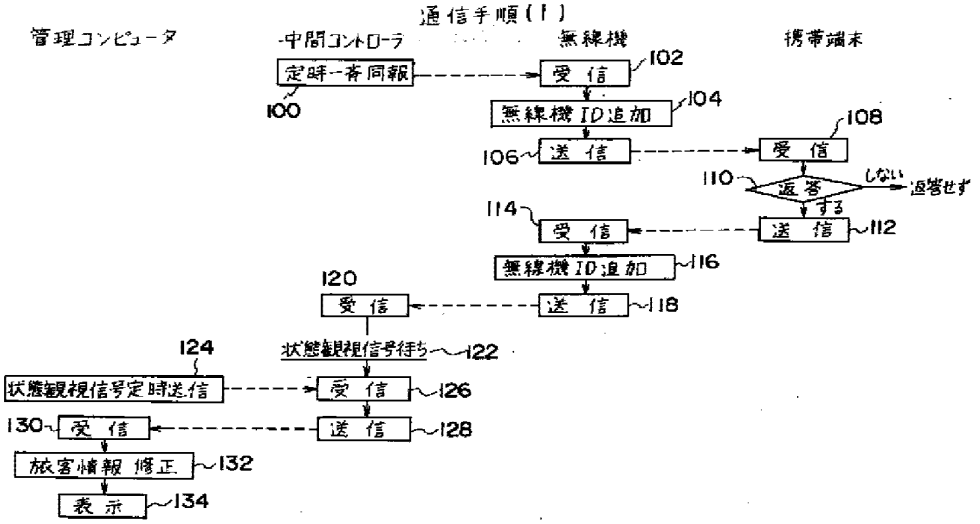


【図４】

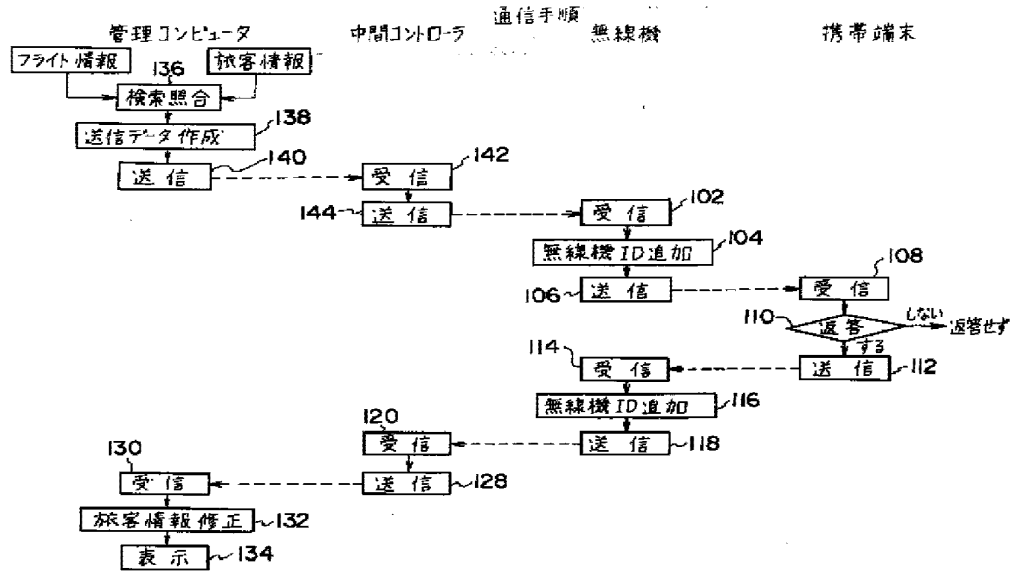


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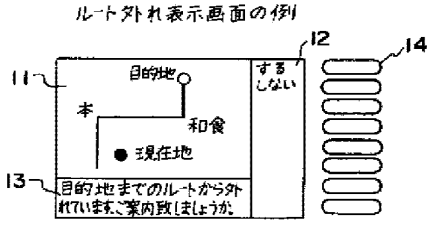
【図６】



【図７】



【図１７】



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【図8】

管理コンピュータが扱う情報

便名	発着時刻	情報
XX123	00:00	
00456	0x:0x	キャンセル
0x789	xx:xx	

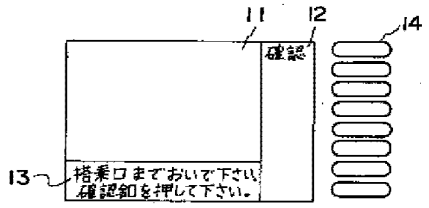
(a)フライト情報

端末ID	氏名	搭乗便	現在地アドレス
XXXXXXX	XXXX	XXXXX	XXXXXXX
⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮

(b)旅客情報

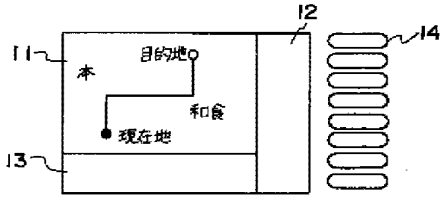
【図10】

メッセージ表示画面の例
(呼出しメッセージの例)



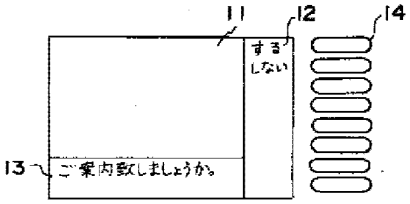
【図13】

誘導表示画面の例



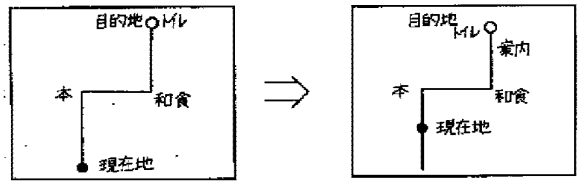
【図14】

誘導有無選択画面の例

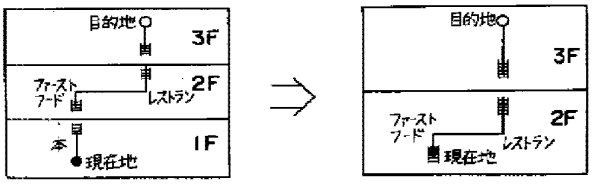


【図20】

現在地変化に伴う表示倍率自動変更



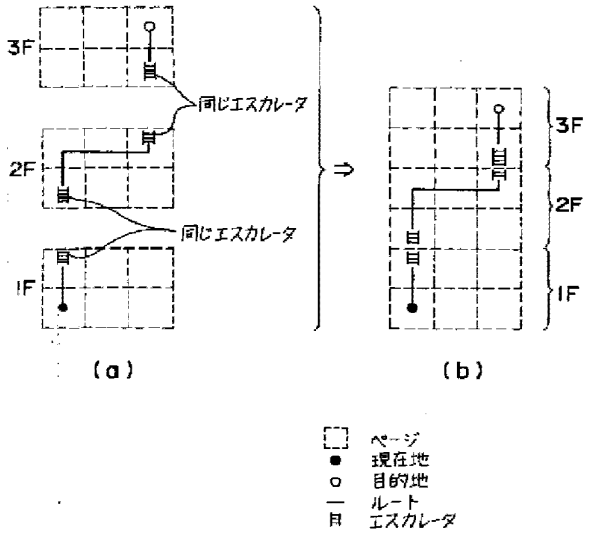
(a)ルートが複数の階にまたがっていないとき



(b)ルートが複数の階にまたがっているとき

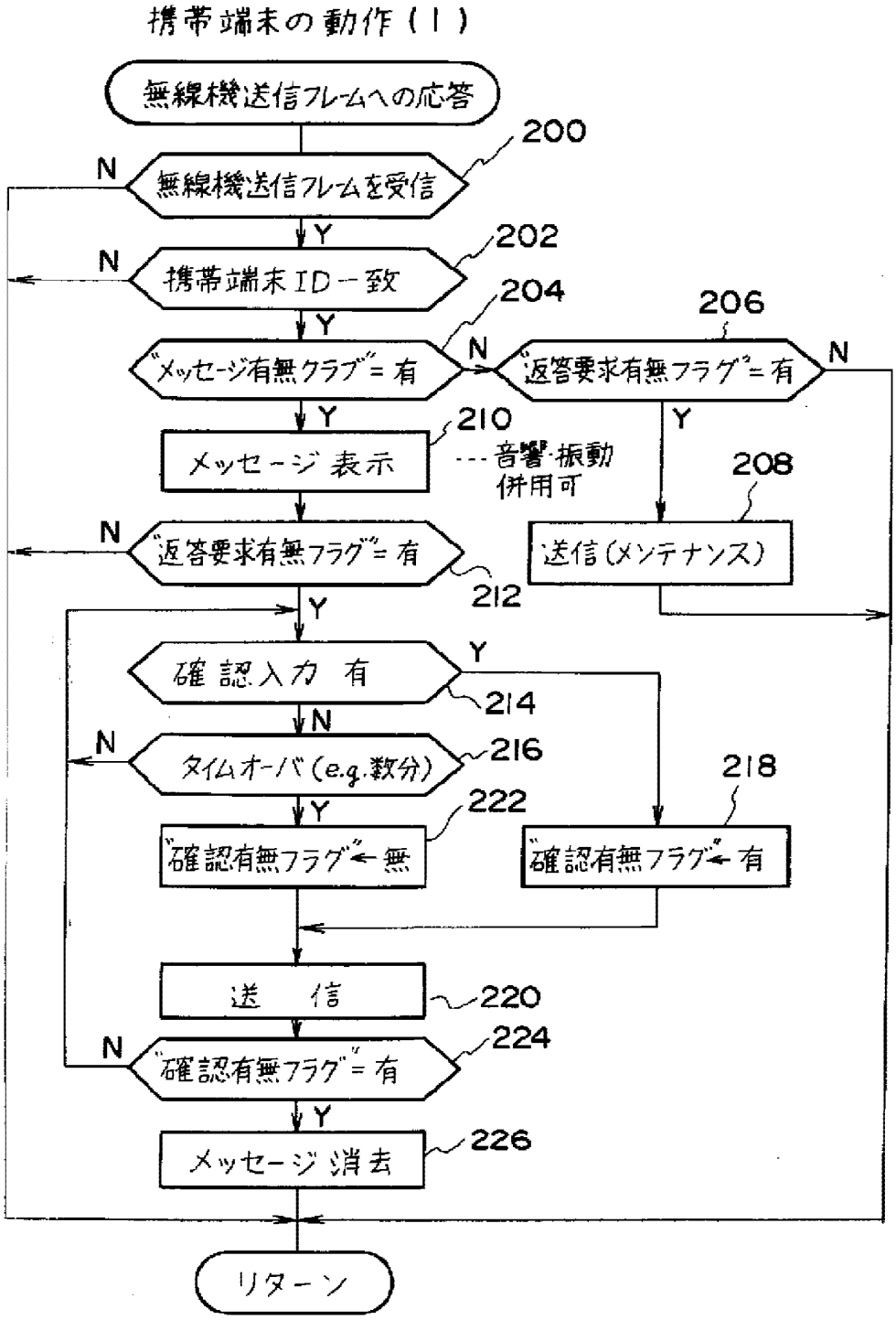
【図21】

エスカレータの縦位置をそろえる処理



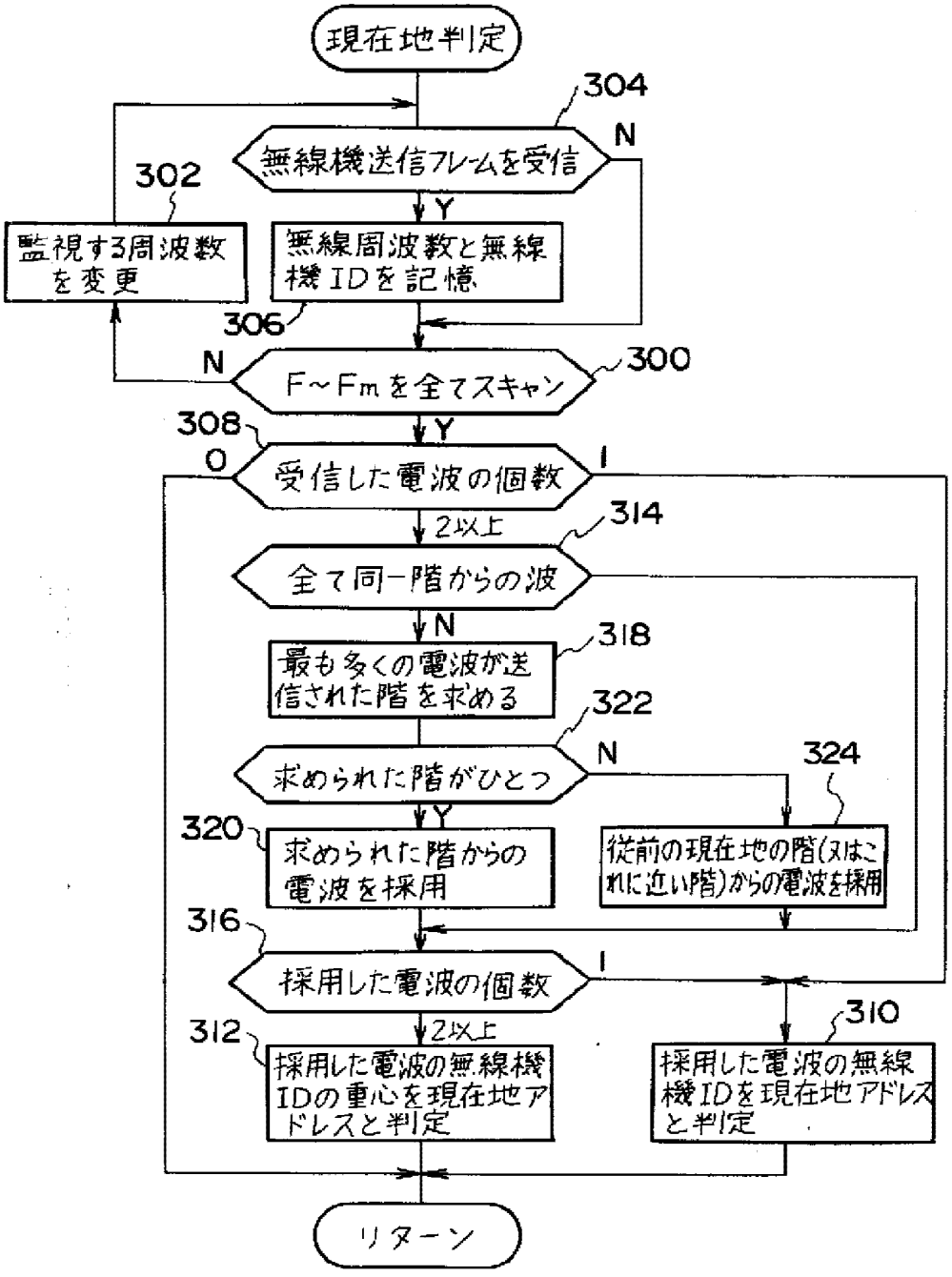
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【図９】


携帯端末の動作（１）
無線機送信フレームへの応答
200
無線機送信フレームを受信
N
Y
202
携帯端末ID一致
204
"メッセージ有無クラブ"＝有
206
"返答要求有無フラグ"＝有
210
メッセージ表示
---音響・振動併用可
208
送信（メンテナンス）
"返答要求有無フラグ"＝有
212
確認入力　有
214
タイムオーバ（e.g.数分）
216
218
"確認有無フラグ"←無
222
"確認有無フラグ"←有
送　信
220
"確認有無フラグ"＝有
224
メッセージ消去
226
リターン

【図１１】

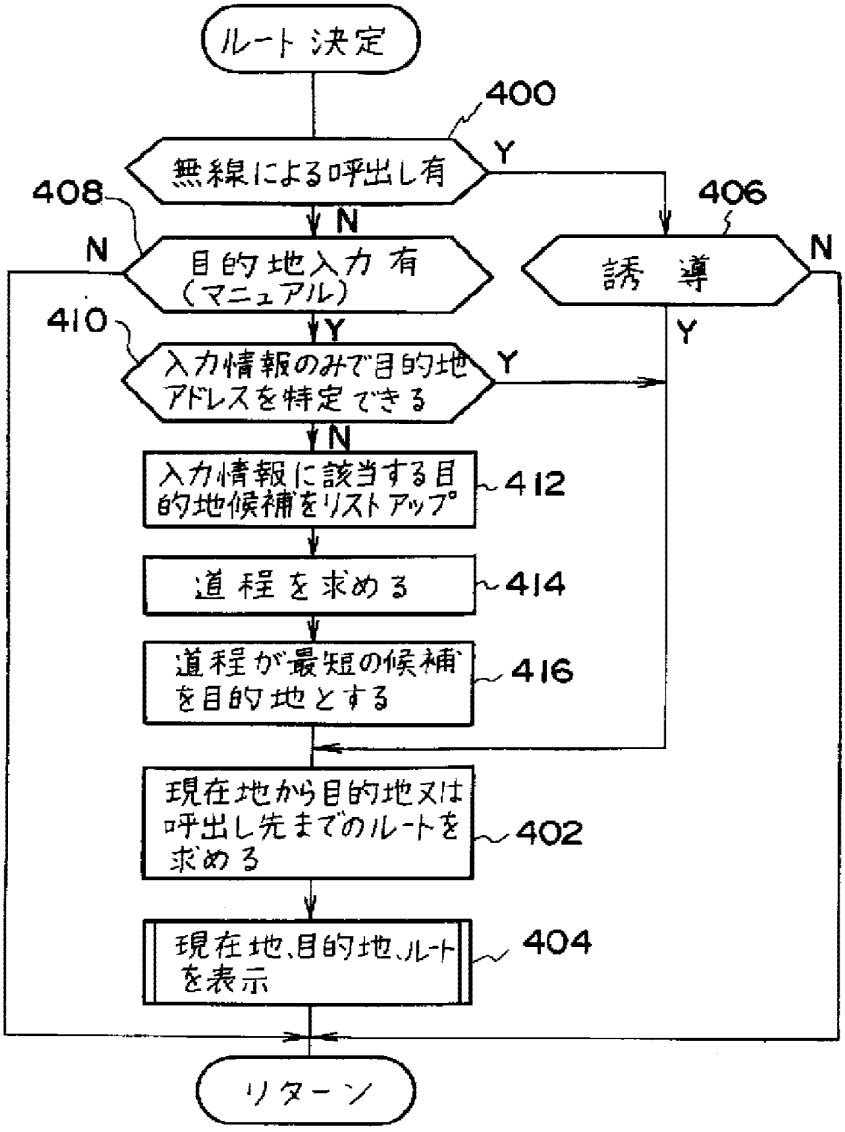
携帯端末の動作（２）



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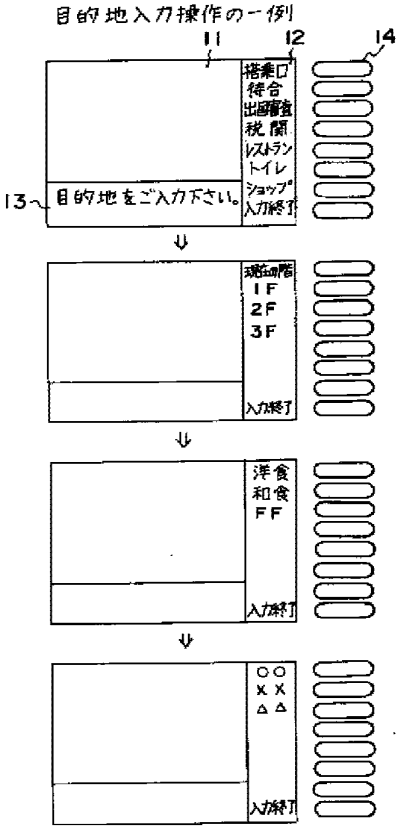
【図１２】

携帯端末の動作（３）

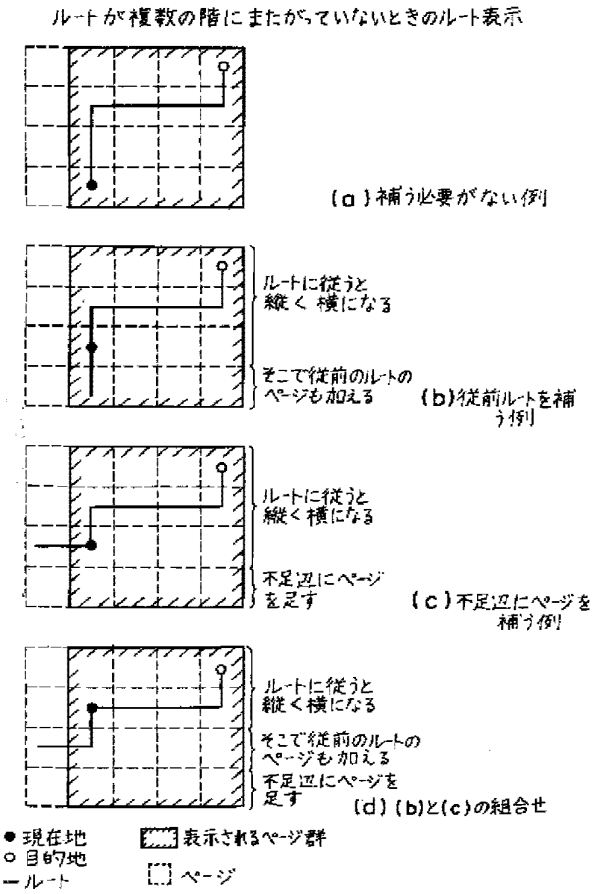


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【図１５】



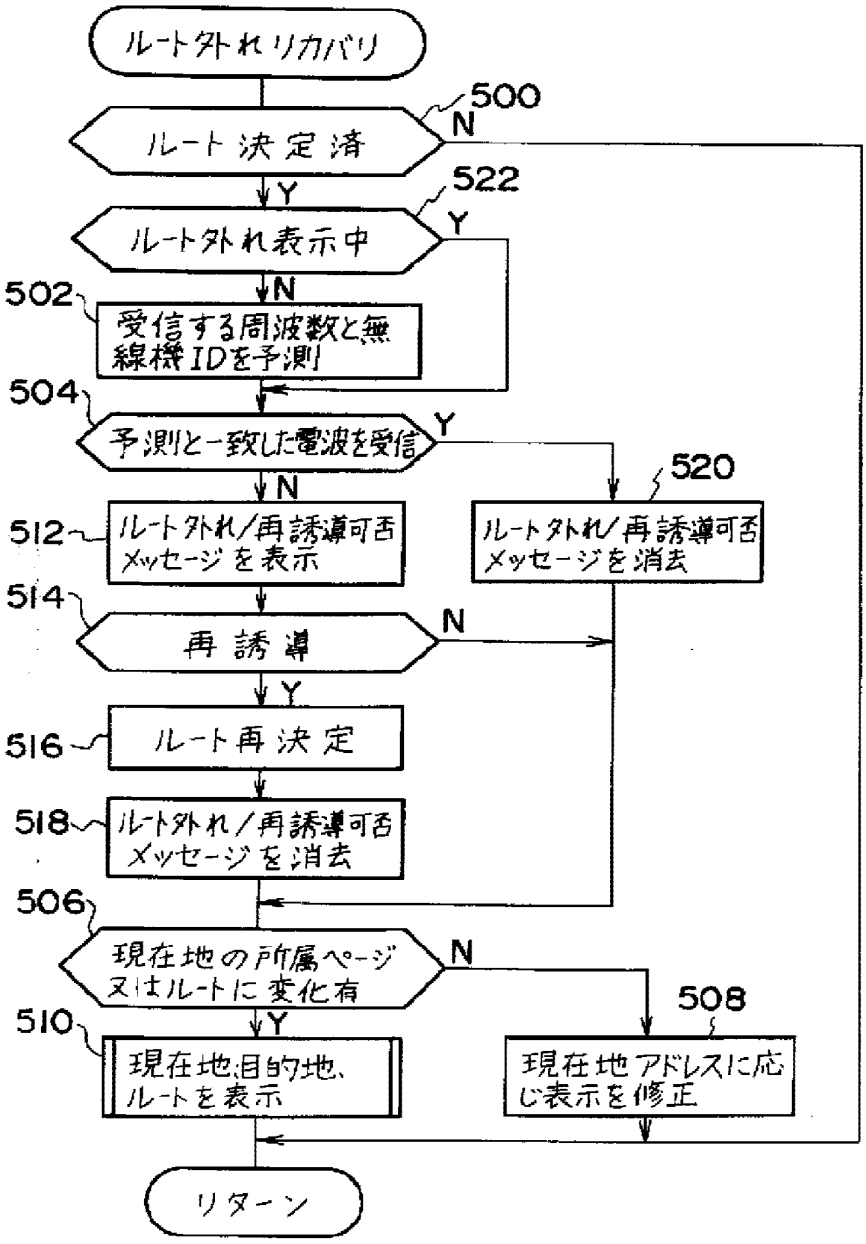
【図１９】



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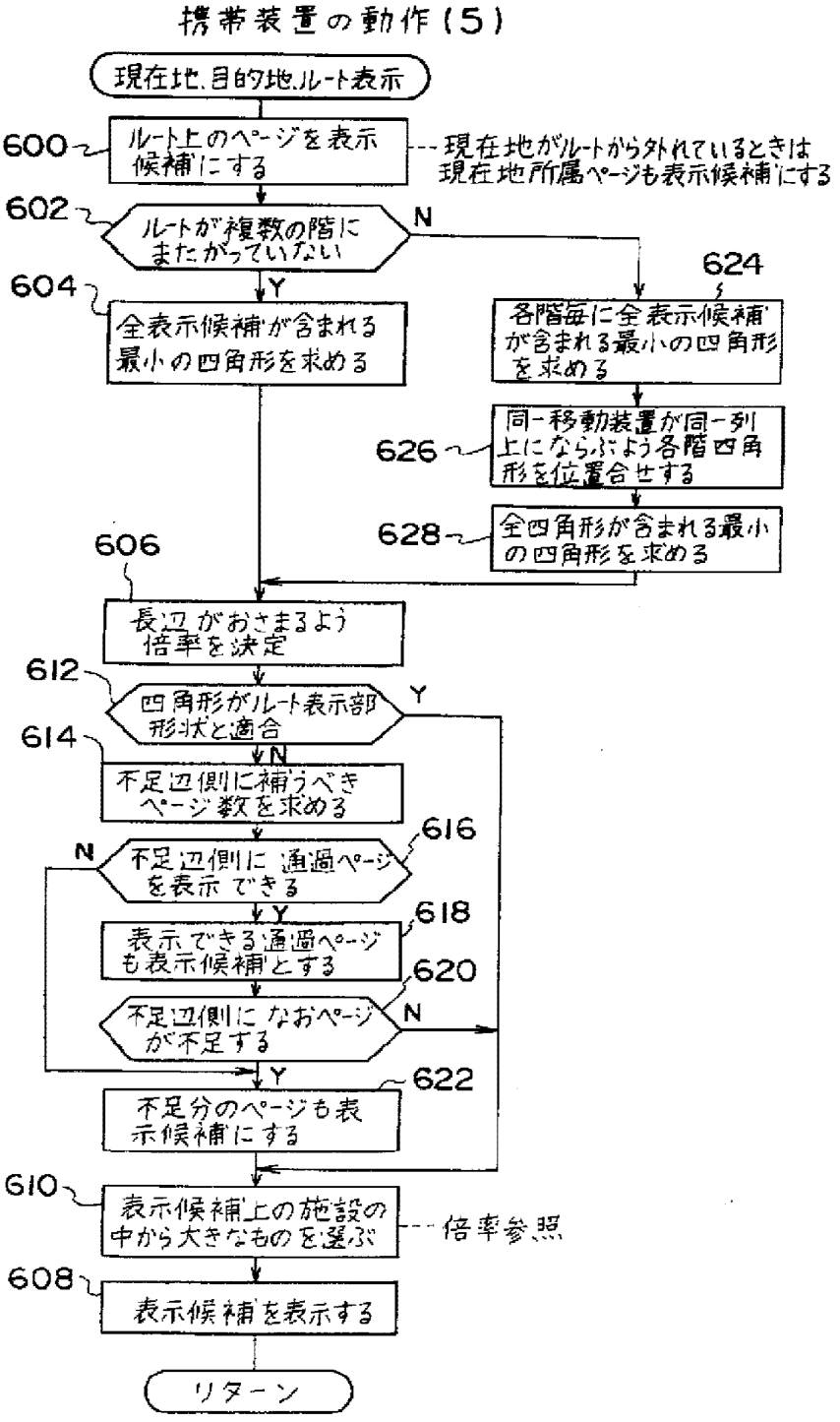
【図１６】

携帯端末の動作（４）



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【図１８】



Google Ex. 1029, p. 385

DERWENT-ACC-NO: 1997-323525

DERWENT-WEEK: 199730

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TITLE: Route guidance system to guide user inside buildings uses portable terminal which receives wireless transmission of radios distributed in buildings to determine then current position and path

INVENTOR: YAMAZAKI M

PATENT-ASSIGNEE: TOYOTA JIDOSHA KK[TOYT]

PRIORITY-DATA: 1995JP-287601 (November 6, 1995)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
JP 09126804 A	May 16, 1997	JA

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 09126804A	N/A	1995JP-287601	November 6, 1995

INT-CL-CURRENT:

TYPE	IPC DATE
CIPP	G09B29/10 20060101
CIPS	G01C21/00 20060101
CIPS	G01S5/02 20060101
CIPS	G06Q30/00 20060101
CIPS	G06Q50/00 20060101
CIPS	G08G1/0969 20060101

ABSTRACTED-PUB-NO: JP 09126804 A

BASIC-ABSTRACT:

The system consists of radio distributed inside building and portable terminal carried by guide user. Each radio transmits its current position at its own frequency. User terminal receives this information based on which the current position of user and route to destination are displayed on indoor map. Each portable terminal will receive radio position information without collision of informations from other radios and hence route information is continuously provided to user. It in turn makes the reaching of the destination easier without fear of moving in a wrong path.

ADVANTAGE - User of portable terminal which can extend to extent is of greater importance. Is excellent form to collect information at exact position.

CHOSEN-DRAWING: Dwg.1/1

TITLE-TERMS: ROUTE GUIDE SYSTEM USER BUILD PORTABLE TERMINAL RECEIVE WIRELESS TRANSMISSION RADIO DISTRIBUTE DETERMINE CURRENT POSITION PATH

DERWENT-CLASS: P85 S02 W06

EPI-CODES: S02-B08A; W06-A02A; W06-A03;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: 1997-267669

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14285273	MENDELSON, EHUD
	Examiner	Art Unit
	NGHI H LY	2642

CPC- SEARCHED		
Symbol	Date	Examiner
H04W 04/00, H04W 4/02, H04L29/08657	3/16/2015	nly

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
See search history.	3/16/2015	nly

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
455	456.1,404.2,414.1,456.3	3/16/2015	nly

SEARCH NOTES		
Search Notes	Date	Examiner
See search history.	3/16/2015	nly

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
455	456.1,404.2,414.1,456.3	3/16/2015	nly

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BIB DATA SHEET

CONFIRMATION NO. 9122

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/285,273	05/22/2014	455	2642	MEN-14-002

APPLICANTS

INVENTORS

Ehud Mendelson, Coral Springs, FL;

**** CONTINUING DATA ***************************

This application is a DIV of 14/285,209 05/22/2014
which is a DIV of 12/930,735 01/14/2011
which is a DIV of 11/396,843 04/03/2006 PAT 7899583
which claims benefit of 60/670,097 04/12/2005
This application 14/285,273 05/22/2014
is a DIV of 13/135,421 07/05/2011
which is a DIV of 12/932,811 03/07/2011 PAT 8941485
which is a DIV of 12/069,899 02/13/2008 PAT 7924149
which is a DIV of 11/472,706 06/22/2006 PAT 8896485
which is a DIV of 11/429,864 05/08/2006 PAT 8836580
which claims benefit of 60/678,947 05/09/2005
This application 14/285,273 05/22/2014
is a DIV of 12/587,042 10/01/2009 PAT 8866673
which is a DIV of 11/429,864 05/08/2006 PAT 8836580
which claims benefit of 60/678,947 05/09/2005

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
06/04/2014

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /NGHI H LY/ Examiner's Signature	☐ Met after Allowance nly Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		FL	13	21	2

ADDRESS

ALLEN D. HERTZ
ALLEN D HERTZ, P.A.
12784 TULIPWOOD CIRCLE
BOCA RATON, FL 33428
UNITED STATES

TITLE

INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

FILING FEE RECEIVED		
770	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue)

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14285273	MENDELSON, EHUD
	Examiner	Art Unit
	NGHI H LY	2642

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	03/18/2015								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	O								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								
	21	✓								

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L8	3	((display$4 screen$3 lcd) near12 (location$3 position$3 geograph$5)) with map$5 with (beacon near3 (id identifier identification name number)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 20:07
L9	3	((display$4 screen$3 lcd) with (location$3 position$3 geograph$5 area region zone cell)) with map$5 with (beacon near3 (id identifier identification name number)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 20:16
L10	6	((display$4 screen$3 lcd) with (location$3 position$3 geograph$5 area region zone cell)) with map$5 with (beacon near12 (id identifier identification name number)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 20:16
L11	15	(beacon adj signal) and ((display$4 screen$3 lcd) with (location$3 position$3 geograph$5 area region zone cell)) with map$5 with (id identifier identification name number) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 20:18
L14	2	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 20:57
L18	0	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based adj service))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 20:58
L20	9	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid)	US-PGPUB; USPAT;	OR	ON	2015/03/18 20:59

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		same (beacon near12 signal))	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
L22	5	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 20:59
L23	0	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) and (beacon near12 signal) and market).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 21:00
L26	6	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) and (beacon near12 signal) and (map market)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 21:00
L27	1	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) and (beacon near12 signal) and (map market) and (present subsequen$5)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 21:11
S2	2281	(wifi wi-fi bluetooth blue-tooth ieee$5 zigbee) and (beacon near12 signal) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 08:30
S3	42	((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 08:30
S4	13	(h04w04/00.cpc. h04w4/02.cpc. h04l29/08657.cpc. 455/456.1.ccls. 455/404.2.ccls. 455/414.1.ccls. 455/456.3.ccls.) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 08:30

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		department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility)) and @ad<"20050412"				
S5	0	((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal) same (local adj based adj service)) with ((local adj based adj service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 08:32
S6	1	(assistan$4 help$3 service advertis$5 support$3 provid$4 information).ti. and (beacon adj22 (wifi wi-fi)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 08:33
S39	0	((indoor adj map) near12 (floor adj plan adj image) near12 (indoor adj1 image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 20:59
S40	0	((indoor adj map) near12 (floor adj plan adj image)) and ((indoor adj map) near12 (indoor adj1 image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:00
S41	0	((map) near12 (floor adj plan adj image)) and ((indoor adj map) near12 (indoor adj1 image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:00
S42	0	((floor adj plan adj image)) and ((indoor adj map) near12 (indoor adj1 image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:00
S43	0	((floor adj plan adj image) and (indoor adj1 image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2015/03/16 21:01

			IBM_TDB			
S44	1	((floor adj plan adj image) and (indoor adj1 image))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:01
S45	0	((map) near12 (floor adj plan adj image)) and ((map) near12 (indoor near3 (photo picture image))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:02
S46	0	((map) near12 (floor adj plan adj image)) and ((map) near12 (indoor near3 (photo$7 picture image))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:03
S47	5	((map) near12 (floor adj plan adj image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:03
S48	0	((indoor adj map) near12 (floor adj plan adj image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:04
S49	0	((indoor near3 map) near12 (floor adj plan adj image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:04
S50	2	((indoor near3 map) near12 (floor near2 plan ear2 image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:05
S51	0	((indoor near3 map) near12 (floor near2 plan near2 image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:05
S52	0	((indoor near3 map) near12 (floor near2 plan$3 near2 imag$3)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/03/16 21:05

			EPO; JPO; DERWENT; IBM_TDB			
S53	0	((indoor near3 map) near12 (floor near2 plan$3 near3 imag$3)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 21:06
S56	0	((map) near22 (indoor adj1 image)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:48
S58	1	((map) near17 (indoor near3 (image photograph$4 photo picture))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:49
S59	1	((map) near17 (indoor near3 (imag$3 photograph$4 photo picture))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:50
S60	1632	((map) near17 ((within inside indoor) near3 (image photograph$4 photo picture))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:50
S61	706	((map) near17 ((within inside indoor) near1 (image photograph$4 photo picture))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:51
S62	629	((map) near10 ((within inside indoor) near1 (image photograph$4 photo picture))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:51
S63	423	((map) near5 ((within inside indoor) near1 (image photograph$4 photo picture))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:51
S64	89	wireless and ((map) near5 ((within inside indoor) near1 (image photograph$4 photo	US-PGPUB; USPAT;	OR	ON	2015/03/16 22:52

		picture))) and @ad<"20050412"	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S65	3	wireless and ((map) near5 ((inside indoor) near1 (image photograph$4 photo picture))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:54
S66	14	wireless and ((map) near5 ((inside indoor) near3 (image photograph$4 photo picture))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/16 22:56
S85	42	decod$3 near5 receiv$3 near3 (beacon adj signal) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 02:49
S100	58	(map with ((display$4 screen$3 lcd) near12 (location$3 position$3)) with beacon) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 03:51
S101	42	(map near12 ((display$4 screen$3 lcd) near12 (location$3 position$3)) near12 beacon) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 03:51
S102	2	(map near12 ((display$4 screen$3 lcd) near12 (location$3 position$3)) near12 (beacon near5 (id identif$6 name number))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 03:53
S103	42	(map near12 ((display$4 screen$3 lcd) near12 (location$3 position$3)) near12 beacon) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 03:54
S104	9	(map near12 ((display$4 screen$3 lcd) near12 (location$3 position$3)) near12 beacon) and (beacon near5 (id identif$6 name number)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 03:55

S105	9	(map near12 ((display$4 screen$3 lcd) near12 (location$3 position$3)) near12 beacon) and (beacon near5 (id identif$6 name number)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 06:27
S106	46	map and (((display$4 screen$3 lcd) near12 (location$3 position$3)) near12 beacon) and (beacon near5 (id identif$6 name number)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 09:52
S107	8	map and (((display$4 screen$3 lcd) near12 (location$3 position$3) near12 (mobile wireless readio cellular cellphone device apparatus handset handheld ue ms mt)) near12 beacon) and (beacon near5 (id identif$6 name number)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 09:54
S119	10	((decod$3 near12 (beacon adj signal)) near12 (beacon adj (id identifi$7 name number))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 16:36
S120	0	((decod$3 near12 (beacon adj signal)) near12 (beacon adj (id identifi$7 name number))) and (request$3 near12 provider) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 16:45
S122	0	((decod$3 near12 (beacon adj signal)) near12 (beacon adj (id identifi$7 name number))) and (request$3 near22 provider) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 16:46
S124	0	((decod$3 near12 (beacon adj signal)) near12 (beacon adj (id identifi$7 name number))) and ((ask$3 quer$3 request$3) near22 provider) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 16:47
S125	0	((decod$3 near12 (beacon adj signal)) near12 (beacon adj (id identifi$7 name number))) and ((ask$3 quer$3 request$3) near22 (servi$3 market$3 help$3)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 16:48
S126	7	((decod$3 near12 (beacon adj signal)) near12 (beacon adj (id identifi$7 name number))) and (request$3) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2015/03/17 16:49

			DERWENT; IBM_TDB			
S127	0	(beacon adj (id identifi$7 name number)) near12 (request$3 near5 (information) near5 (service adverti$6 advertisement help assistan$6 commercial business)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:12
S128	2	(beacon near2 (id identifi$7 name number)) near12 (request$3 near9 (information) near12 (service adverti$6 advertisement help assistan$6 commercial business)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:13
S129	3	((beacon near2 (id identifi$7 name number)) near12 (request$3 near9 information)) and (request$3 near9 information near12 (service adverti$6 advertisement help assistan$6 commercial business)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:15
S130	5	((beacon near2 (id identifi$7 name number)) near12 (request$3 near9 information)) and (information near12 (service adverti$6 advertisement help assistan$6 commercial business)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:19
S131	4	(service adverti$6 advertisement help assistan$6 commercial business).ab. and ((beacon near2 (id identifi$7 name number)) near12 (request$3 near9 information)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:21
S132	4	(service adverti$6 advertisement help assistan$6 commercial business).ab. and ((beacon near2 (id identifi$7 name number)) near12 ((request$3 ask$3 quer$4) near9 information)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:23
S133	11	(service adverti$6 advertisement help assistan$6 commercial business) and ((beacon near2 (id identifi$7 name number)) near12 ((request$3 ask$3 quer$4) near9 information)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:23
S134	11	(service adverti$6 advertisement help assistan$6 commercial business sale discount) and ((beacon near2 (id identifi$7 name number)) near12 ((request$3 ask$3 quer$4) near9 (service adverti$6 advertisement help assistan$6 commercial business sale discount))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:27
S135	11	((beacon near2 (id identifi$7 name number)) near12 ((request$3 ask$3	US-PGPUB; USPAT;	OR	ON	2015/03/17 17:27

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		quer$4) near9 (service adverti$6 advertisement help assistan$6 commercial business sale discount))) and @ad<"20050412"	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S136	15	((beacon near2 (id identifi$7 name number)) with ((request$3 ask$3 quer$4) near9 (service adverti$6 advertisement help assistan$6 commercial business sale discount))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:34
S137	15	((beacon near2 (id identifi$7 name number)) with ((request$3 ask$3 quer$4) near9 (market$3 service adverti$6 advertisement help$3 assistan$6 commercial business sale discount))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:52
S138	18	((beacon near5 (id identifi$7 name number)) with ((request$3 ask$3 quer$4) near9 (market$3 service adverti$6 advertisement help$3 assistan$6 commercial business sale discount))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 17:52
S139	3	((station tower access adj (point port node)) near5 (beacon adj signal)) and (((station tower access adj (point port node)) adj1 (id identifi$7 name number)) with ((request$3 ask$3 quer$4) near9 (market$3 service adverti$6 advertisement help$3 assistan$6 commercial business sale discount))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 22:04
S140	2	((station tower access adj (point port node)) near9 (beacon adj signal)) and (((station tower access adj (point port node)) adj1 (id identifi$7 name number)) near22 ((request$3 ask$3 quer$4) near12 (market$3 service adverti$6 advertisement help$3 assistan$6 commercial business sale discount))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 22:08
S141	11	((station tower access adj (point port node)) near9 (beacon adj signal)) and (((station tower access adj (point port node)) near3 (id identifi$7 name number)) near22 ((request$3 ask$3 quer$4) near12 (market$3 service adverti$6 advertisement help$3 assistan$6 commercial business sale discount))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/17 22:09
S142	0	((display$4 screen$3 lcd) near5 (current$4 adj3 (location$3 position$3)) near12 (floor adj map)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 00:16
S143	0	((display$4 screen$3 lcd show$3) near7	US-PGPUB;	OR	ON	2015/03/18

		(current$4 adj3 (location$3 position$3)) near12 (floor adj map)) and @ad<"20050412"	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			00:20
S144	1	((display$4 screen$3 lcd show$3) near7 (current$4 near3 (location$3 position$3)) near12 (floor adj map)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 00:20
S146	136	((display$4 screen$3 lcd show$3) near7 (location$3 position$3) near12 (overlaid near12 map)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:02
S147	0	((display$4 screen$3 lcd show$3) near7 (location$3 position$3) near12 beacon near12 (overlaid near12 map)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:02
S148	3	((display$4 screen$3 lcd show$3) near7 (location$3 position$3) near22 (beacon base access) near22 overlaid near12 map) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:03
S149	2	((arrival near4 notification) near22 beacon) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:11
S150	4	(((enter$4 commig arriv$4) near4 notification) near22 beacon) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:12
S151	15	(((enter$4 commig arriv$4) near4 (notif$4 alert$3 notification)) near22 beacon) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:13
S154	47	(((enter$4 access$3 travel$3 roam$3 comming arriv$4) near4 (notif$4 alert$3 notification)) near22 beacon) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2015/03/18 01:16

			IBM_TDB			
S155	72	(((enter$4 access$3 travel$3 roam$3 comming arriv$4) near7 (notif$4 alert$3 notification)) near12 beacon) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:16
S156	58	(((enter$4 access$3 travel$3 roam$3 comming arriv$4) adj12 beacon) near7 (notif$4 alert$3 notification)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:17
S157	22	(((enter$4 travel$3 roam$3 comming arriv$4) adj12 beacon) near7 (notif$4 alert$3 notification)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:18
S158	22	(((enter$4 travel$3 roam$3 comming arriv$4) adj7 beacon) near7 (notif$4 alert$3 notification)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:18
S159	21	(((enter$4 travel$3 roam$3 comming arriv$4) adj5 beacon) near7 (notif$4 alert$3 notification)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:18
S166	17	(current$4 adj3 (location$3 position$3)) with (subsequent$4 adj3 (location$3 position$3)) with (path road) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:37
S167	14	(current$4 adj3 (location$3 position$3)) with (subsequent$4 adj3 (location$3 position$3)) near22 (path road) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:37
S168	14	(current$4 adj3 (location$3 position$3)) near22 (subsequent$4 adj3 (location$3 position$3)) near22 (path road) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:38
S169	2	(current$4 adj (location$3 position$3)) near22 (subsequent$4 adj (location$3 position$3)) near22 (path road) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/03/18 01:39

			EPO; JPO; DERWENT; IBM_TDB			
S170	147	(current$4 near2 (location$3 position$3)) near22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) near2 (location$3 position$3)) near22 (path road) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:42
S171	64	((current$4 near2 (location$3 position$3)) adj22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) near2 (location$3 position$3))) near22 (path road) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:43
S172	105	((current$4 adj (location$3 position$3)) near22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj (location$3 position$3))) near22 (path road)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:49
S173	12	((current$4 adj (location$3 position$3)) near22 ((subsequent$4) adj (location$3 position$3))) near22 (path road)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 01:50
S176	0	(overlay$4 overlaid) near12 (concentric near3 circles) near12 map with (distan$4 far) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:02
S177	0	(overlay$4 overlaid overlap$6) near12 (concentric near3 circles) near12 map with (distan$4 far) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:03
S178	0	(overlay$4 overlaid overlap$6 (over near3 (top surface))) near12 (concentric near3 circles) near22 map near22 (distan$4 far) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:05
S179	4	(overlay$4 overlaid overlap$6 (over near3 (top surface))) near12 (circles) near22 map near22 (distan$4 far) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:05
S180	2	(overlay$4 overlaid overlap$6 (over near3 (top surface))) near12 (concentric near3	US-PGPUB; USPAT;	OR	ON	2015/03/18 02:07

		circles) near22 map and @ad<"20050412"	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S181	3	(overlay$4 overlaid overlap$6 (top surface)) near12 (concentric near3 circles) near22 map and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:08
S182	1	(top surface) near12 (concentric near3 circles) near22 map and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:09
S183	113	(concentric near3 circles) near22 map and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:09
S184	104	(concentric near3 circles) near12 map and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:09
S185	10	(concentric near3 circles) near12 map near12 distan$6 and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 02:10
S188	296	((display$4) near22 (location position geograph$4) near22 (id identification identifier) near22 (overlaid top surface)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 07:00
S189	8	((display$4) near22 (location position geograph$4) near22 ((access base beacon tower) near6 (id identification identifier)) near22 (overlaid top surface)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 07:01
S191	667	(((current$4 present$3) adj2 (location$3 position$3)) adj22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 12:28

S192	21	(repeat$4 again$3) near22 (((current$4 present$3) adj2 (location$3 position$3)) adj22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 13:00
S193	15	(repeat$4 again) near22 (((current$4 present$3) adj2 (location$3 position$3)) adj22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 13:06
S194	33	(repeat$4 again) near22 (((current$4 present$3) adj2 (location$3 position$3)) near22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 13:10
S195	7	(repeat$4 again) near22 determin$4 near22 (((current$4 present$3) adj2 (location$3 position$3)) near22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 14:12
S196	2	(repeat$4 again) near22 calculat$4 near22 (((current$4 present$3) adj2 (location$3 position$3)) near22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:10
S197	52	(repeat$4 again) near12 ((location$3 position$3) near22 (determin$4 adj6 (subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:16
S199	0	(repeat$4 again) near12 ((location$3 position$3) near22 (determin$4 adj6 (subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and (associat$5) adj5 (((current$4 present$3) adj2 (location$3 position$3)) near7 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:21
S200	0	(repeat$4 again) near12 ((location$3 position$3) near22 (determin$4 adj6 (subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and (associat$5 adj5 ((current$4 present$3) adj2 (location$3 position$3)) adj7 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:23

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		(location$3 position$3))) and @ad<"20050412"				
S201	1	associat$5 adj5 ((current$4 present$3) adj2 (location$3 position$3)) adj7 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:24
S202	276	((current$4 present$3) adj2 (location$3 position$3)) adj3 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:25
S203	0	(repeat$4 again) near12 ((location$3 position$3) near22 (determin$4 adj6 (subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and (path route) near7 between near7 (((current$4 present$3) adj2 (location$3 position$3)) near7 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:31
S204	0	(path route) near7 between near7 (((current$4 present$3) adj2 (location$3 position$3)) near7 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:32
S205	46	(path route) near7 (((current$4 present$3) adj2 (location$3 position$3)) near7 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) adj2 (location$3 position$3))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 16:32
S207	2	(beacon near2 (id identifi$7 name number)) near12 (request$3 near9 (information) near12 (service adverti$6 advertisement help assistan$6 commercial business)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 17:48
S208	11	(beacon near2 (id identifi$7 name number)) near12 (request$3 near9 (service adverti$6 advertisement help assistan$6 commercial business)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 17:49
S212	11	(beacon near2 (id identifi$7 name number code)) near12 (request$3 near12 (service adverti$6 advertisement help assistan$6 commercial business market$3)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2015/03/18 17:57

			IBM_TDB			
S213	8	(beacon adj signal) and ((bluetooth station blue adj tooth tower access adj (point node port)) near3 (id identifi$7 name number)) near12 (request$3 near9 (service adverti$6 advertisement help assistan$6 commercial business)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 17:59
S214	72	(beacon adj signal) and ((id identifi$7 name number) near12 (request$3 near9 (service adverti$6 advertisement help assistan$6 commercial business))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 18:01
S215	70	(beacon adj signal) and ((id identifi$7 name number) near12 request$3 near9 (service adverti$6 advertisement help assistan$6 commercial business)) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 18:02
S216	58	(beacon adj signal) and ((id identifi$7 name number) near12 (request$3 near5 (service adverti$6 advertisement help assistan$6 commercial business))) and @ad<"20050412"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/18 18:02

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L12	16	(beacon adj signal) and ((display$4 screen$3 lcd) with (location$3 position$3 geograph$5 area region zone cell)) with map$5 with (id identifier identification name number) and @ad<"20050412"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 20:55
L13	2	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility))	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 20:57
L15	2	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 20:58

Google Ex. 1029, p. 406

		train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility))				
L19	2	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility))	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 20:58
L21	9	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal))	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 20:59
L24	0	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) and (beacon near12 signal) and market).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 21:00
L25	6	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) and (beacon near12 signal) and (map market)).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 21:00
L28	1	(Mendelson near3 Ehud) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) and (beacon near12 signal) and (map market) and (present subsequen$5)).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 21:11
S7	42	((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility)) and @ad<"20050412"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/16 08:30
S8	13	(h04w04/00.cpc. h04w4/02.cpc. h04l29/08657.cpc. 455/456.1.ccls. 455/404.2.ccls. 455/414.1.ccls. 455/456.3.ccls.) and ((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility)) and @ad<"20050412"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/16 08:30

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S9	0	((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal) same (local adj based adj service)) with ((local adj based adj service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility)) and @ad<"20050412"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/16 08:32
S10	1	(assistan$4 help$3 service advertis$5 support$3 provid$4 information).ti. and (beacon adj22 (wifi wi-fi)) and @ad<"20050412"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/16 08:33
S11	42	((wifi wi-fi bluetooth blue-tooth ieee$5 zigbee rfid) same (beacon near12 signal)) and ((activat$4 turn$3 switch$4) near12 (local adj based service)) and ((local adj based service) near22 (outdoors indoors home mall department store specialty conference trade show amusement park university hospital school municipal building museum subway train station airport hotel resort casino cruise ship down town center amusement park museum sport stadium financial institute parking facility)) and @ad<"20050412"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/16 08:35
S12	2134	(wifi wi-fi bluetooth blue-tooth ieee$5 zigbee) and (beacon near12 signal) and @ad<"20050412"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/16 08:35
S186	53	((current$4 near2 (location$3 position$3)) adj22 ((subsequent$4 after coming futur$4 later conecutiv$4 sequent$4 success$6) near2 (location$3 position$3))) near22 (path road) and @ad<"20050412"	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 01:47
S187	12	((current$4 adj (location$3 position$3)) near22 ((subsequent$4) adj (location$3 position$3))) near22 (path road)	US-PGPUB; USPAT; UPAD	OR	ON	2015/03/18 01:50

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/285,273	05/22/2014	3661	770	MEN-14-002	21	2

CONFIRMATION NO. 9122

CORRECTED FILING RECEIPT

31877
ALLEN D. HERTZ
ALLEN D HERTZ, P.A.
12784 TULIPWOOD CIRCLE
BOCA RATON, FL 33428



Date Mailed: 06/09/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Ehud Mendelson, Coral Springs, FL;

Applicant(s)

Ehud Mendelson, Coral Springs, FL;

Power of Attorney: The patent practitioners associated with Customer Number 31877

Domestic Priority data as claimed by applicant

This application is a DIV of 14/285,209 05/22/2014
which is a DIV of 12/930,735 01/14/2011
which is a DIV of 11/396,843 04/03/2006 PAT 7899583
which claims benefit of 60/670,097 04/12/2005
This application 14/285,273
is a DIV of 13/135,421 07/05/2011
which is a DIV of 12/932,811 03/07/2011 ABN
which is a DIV of 12/069,899 02/13/2008 PAT 7924149
which is a DIV of 11/472,706 06/22/2006
which is a DIV of 11/429,864 05/08/2006
which claims benefit of 60/678,947 05/09/2005
This application 14/285,273
is a DIV of 12/587,042 10/01/2009
which is a DIV of 11/429,864 05/08/2006
which claims benefit of 60/678,947 05/09/2005

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.

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Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 06/04/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/285,273**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

**** SMALL ENTITY ****

Title

INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

Preliminary Class

701

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/285,273	05/22/2014	3661	770	MEN-14-002	21	2

CONFIRMATION NO. 9122

31877
ALLEN D. HERTZ
ALLEN D HERTZ, P.A.
12784 TULIPWOOD CIRCLE
BOCA RATON, FL 33428

FILING RECEIPT



Date Mailed: 06/06/2014

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Applicant(s)

Ehud Mendelson, Coral Springs, FL;

Power of Attorney: The patent practitioners associated with Customer Number 31877

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This application 14/285,273
is a DIV of 13/135,421 07/05/2011
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which is a DIV of 12/069,899 02/13/2008 PAT 7924149
which is a DIV of 11/472,706 06/22/2006 *
which is a DIV of 11/429,864 05/08/2006 *
which claims benefit of 60/678,947 05/09/2005
This application 14/285,273
is a DIV of 12/587,042 10/01/2009
which is a DIV of 11/429,864 05/08/2006 *
which claims benefit of 60/678,947 05/09/2005
(*)Data provided by applicant is not consistent with PTO records.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.

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If Required, Foreign Filing License Granted: 06/04/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/285,273**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

**** SMALL ENTITY ****

Title

INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

Preliminary Class

701

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/285,273

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	21 minus 20 =	* 1	x 40 =	40	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	770		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

In The United States Patent and Trademark Office

Application No.	: 14/285,273	Confirmation No. 9122
Applicant	: Ehud Mendelson	
Title	: **INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS**	
Filed	: May 22, 2014	
TC/A.U.	: 3661	
Examiner	: Not Yet Assigned	Tel: 571 272-4000
Docket No.	: MEN-14-002	
Customer No.	: 31877	

Mail Stop: Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Request For Corrected Official Filing Receipt

Sir:

Applicant received an Official Filing Receipt identifying one entry of the Domestic Priority that was provided by Applicant and not consistent with the PTO records. The submission of a corrected, Supplemental Application Data Sheet is being submitted before the four (4) month anniversary of the filing date of the subject application. Therefore, Applicant believes this response is considered to be timely submitted.

Remarks begin on page 02 of this paper.

Conclusions begin on page 03 of this paper.

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REMARKS

The Official Filing Receipt identified a discrepancy between the Domestic Benefit/National Stage Information section of the submitted Application Data Sheet and the PTO Records dated October 06, 2013.

Applicant is submitted a Supplemental Application Data Sheet (ADS), wherein the Supplemental ADS is amended to reflect the proper filing date for the following applications:

US Patent Application Ser. No.: 60/670,097, by changing the originally indicated filing date of 2005-12-04 to properly read as 2005-04-12.

US Patent Application Ser. No.: 11/472,706, by changing the originally indicated filing date of 2006-22-06 to properly read as 2006-06-22.

US Patent Application Ser. No.: 11/429,864, by changing the originally indicated filing date of 2006-08-05 to properly read as 2006-05-08. (First Instance)

US Patent Application Ser. No.: 11/429,864, by changing the originally indicated filing date of 2006-08-05 to properly read as 2006-05-08. (Second Instance)

Applicant earnestly believes the Supplemental ADS is now consistent with the PTO Records.

Applicant respectfully requests the USPTO issue a Corrected Official Filing Receipt reflecting the correction.

Google Ex. 1029, p. 419

CONCLUSIONS

This correspondence is in response to the inconsistency between data provided by Applicant and the PTO records that was identified in the Official Filing Receipt issued on June 05, 2014.

Applicant is submitting a Supplemental ADS resolving the discrepancy between the data provided by Applicant and the PTO records within four (4) months of the filing date of the application. Therefore, Applicant believes this response is considered to be timely submitted.

Applicant respectfully requests the USPTO issue a Corrected Official Filing Receipt.

If the Examiner believes that there are any informalities that can be corrected by Examiner's amendment, a telephone call to the undersigned Attorney of Record is respectfully solicited.

Respectfully submitted,
Allen D. Hertz
(Customer No. 31877)

By _____
Allen D. Hertz
Reg. No.50,942
12784 Tulipwood Circle
Boca Raton, FL 33428
Tel.: (561) 883-0115
Cell: (561) 716-3915

Attachments:
- Supplemental Application Data Sheet (7 pages)

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Supplemental Data Sheet

PTO/AIA/14 (12-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	14/285,273
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
Mr.	Ehud		Mendelson	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Coral Springs	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	11190 Heron Bay Blvd		
Address 2			
City	Coral Springs	State/Province	FL
Postal Code	33076	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	31877		
Email Address	Patents@AllenHertz.com	Add Email	Remove Email

Application Information:

Title of the Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS		
Attorney Docket Number	MEN-14-002	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	13	Suggested Figure for Publication (if any)	

Filing By Reference :

Supplemental Data Sheet

PTO/AIA/14 (12-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	14/285,273
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., [a]Domestic Benefit/National Stage Information[o] and [a]Foreign Priority Information[o]).

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date(YYYY-MM-DD)	Intellectual Property Authority or Country[i]

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☒ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	31877		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Division of	14285209	2014-05-22
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
14285209	Division of	12930735	2011-01-14
Prior Application Status	Patented		Remove

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Supplemental Data Sheet

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	14/285,273
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12930735	Division of	11396843	2006-04-03	7899583	2011-03-01

Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11396843	Claims benefit of provisional	60670097	~~2005-12-04~~ 2005-04-12
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Division of	13135421	2011-07-05
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
13135421	Division of	12932811	2011-03-07
Prior Application Status	Patented	Remove	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12932811	Division of	12069899	2008-02-13	7924149	2011-04-12

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12069899	Division of	11472706	~~2006-22-06~~ 2006-06-22
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11472706	Division of	11429864	~~2006-08-05~~ 2006-05-08
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11429864	Claims benefit of provisional	60678947	2005-05-09
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Division of	12587042	2009-10-01
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12587042	Division of	11429864	~~2006-08-05~~ 2006-05-08
Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11429864	Claims benefit of provisional	60678947	2005-05-09

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

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Supplemental Data Sheet

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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	14/285,273
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

Supplemental Data Sheet

PTO/AIA/14 (12-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	14/285,273
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Supplemental Data Sheet

PTO/AIA/14 (12-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	14/285,273
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

Mailing Address Information For Applicant:			
Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Supplemental Data Sheet

PTO/AIA/14 (12-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	14/285,273
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature				Date (YYYY-MM-DD)	2014-06-06
First Name	Allen D.	Last Name	Hertz	Registration Number	50942

Additional Signature may be generated within this form by selecting the Add button.

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Electronic Acknowledgement Receipt

EFS ID:	19228793
Application Number:	14285273
International Application Number:	
Confirmation Number:	9122
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Customer Number:	31877
Filer:	Allen D. Hertz
Filer Authorized By:	
Attorney Docket Number:	MEN-14-002
Receipt Date:	06-JUN-2014
Filing Date:	22-MAY-2014
Time Stamp:	00:59:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		MEN-14-002_Mendelson_Mapping_Correction_Of_OFR_060614.pdf	483296 2ab5478fc59bdc09b6d515b1e3f9d633357b4d0e	yes	10

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Request for Corrected Filing Receipt	1	3
	Application Data Sheet	4	10

Warnings:	
Information:	
Total Files Size (in bytes):	483296

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT2878982

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
EHUD MENDELSON	05/23/2014

RECEIVING PARTY DATA

Name:	GAMBA GROUP LIMITED
Street Address:	260 TRIQ SAN ALBERT
City:	BOCA RATON
State/Country:	MALTA
Postal Code:	GZR 1150

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	14285273

CORRESPONDENCE DATA

Fax Number: (561)883-0115

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 561-716-3915
Email: Patents@AllenHertz.com
Correspondent Name: ALLEN D. HERTZ, P.A.
Address Line 1: 12784 TULIPWOOD CIRCLE
Address Line 4: BOCA RATON, FLORIDA 33428

ATTORNEY DOCKET NUMBER:	MEN-14-002
NAME OF SUBMITTER:	ALLEN D. HERTZ
SIGNATURE:	/allen d hertz/
DATE SIGNED:	06/01/2014
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 3
source=MEN-14-002_Mendelson_Mapping_Assignment_Executed#page1.tif
source=MEN-14-002_Mendelson_Mapping_Assignment_Executed#page2.tif
source=MEN-14-002_Mendelson_Mapping_Assignment_Executed#page3.tif

ASSIGNMENT

WHEREAS, I:

(4) **Ehud Mendelson**,

residing, respectively, at:

(4) **11190 Heron Bay Blvd. Suite 916, Coral Springs, FL, 33076**,

have made an invention entitled: **INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS**

and [ ] are about to make application for United States Letters Patent therefor, the same being executed by us on _____, 2014; and

[X] has made application for United States Letters Patent thereof, filed **May 22, 2014**, under **Serial No. 14/285,273**, currently pending; and

WHEREAS, **Gamba Group Limited**, a For Profit Corporation organized and existing under the laws of the state of **Malta** and having an office and place of business at **262 Triq San Alber, Gzira, Malta, GZR 1152**, is desirous of acquiring the entire interest in said invention, said United States patent application, and in any Letters Patent which may issue thereon;

NOW, THEREFORE, be it known that for and in consideration of my employment **Gamba Group Limited**, and other good and valuable consideration, I do hereby sell, assign, and transfer unto **Gamba Group Limited**, its successors, assigns, and legal representatives, all right, title, and interest in and to said invention and any improvements thereon for all countries of the world, and in and to said application, including any continuations and divisions thereof, and any substitute applications therefor, and any patent which may issue thereon, and any reissues of the same; and all right, title, and interest in and to every patent application filed on said invention in any other country, including renewals, revivals, continuations, and divisions thereof, and any substitute applications therefor, and any and all patents which may issue thereon, and any reissues and extensions of the same; and we hereby authorize and request competent authorities to grant and issue any and all patents on said invention to **Gamba Group Limited** as the assignee of the entire interest therein; and we further agree to execute upon request of the assignee such additional documents, if any, as are necessary and proper to secure patent protection on said invention throughout all countries of the world, and otherwise to give full effect to and perfect the rights of the assignee under this Assignment.

IN TESTIMONY WHEREOF, I have hereunto signed my name on the dates indicated hereinafter:

05/23/2014
Date

Ehud Mendelson

STATE OF Florida)
) ss.:
COUNTY OF Broward)

Before me, a Notary Public for Said County, personally appeared Ehud Mendelson, to me known and known to me to be the person who executed the foregoing instrument and acknowledged it to be a free act and deed.

Witness my hand and seal May 23rd, 2014.

Claudia Maria Williams
Notary Public

[Notary Seal]

My Commission expires:
Dec 18, 2015

PTO/AIA/15 (09-13)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	MEN-14-002
First Named Inventor	Ehud Mendelson
Title	[illegible]
Express Mail Label No.	Filed via EFSweb

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

1. [✓] **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. [✓] **Applicant asserts small entity status.** See 37 CFR 1.27
3. [ ] **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. [✓] **Specification** [*Total Pages* 114] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. [✓] **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 13]
6. [✓] **Inventor's Oath or Declaration** [*Total Pages* 1] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. [✓] Newly executed (original or copy)
   b. [ ] A copy from a prior application (37 CFR 1.63(d))
7. [✓] **Application Data Sheet** * See note below. See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** In duplicate, large table, or Computer Program (*Appendix*)
   [ ] Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** *(if applicable, items a. – c. are required)*
   a. [ ] Computer Readable Form (CRF)
   b. [ ] Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or
      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ACCOMPANYING APPLICATION PAPERS

10. [ ] **Assignment Papers** (cover sheet & document(s)) Name of Assignee _____
11. [ ] **37 CFR 3.73(c) Statement** (when there is an assignee) [✓] **Power of Attorney**
12. [ ] **English Translation Document** (*if applicable*)
13. [ ] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of citations attached
14. [ ] **Preliminary Amendment**
15. [ ] **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. [ ] **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. [✓] **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. [ ] **Other:** _____

*Note: (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 must be included in an Application Data Sheet (ADS). (2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

[✓] The address associated with Customer Number: 31877 OR [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature		Date	May 22, 2014
Name (Print/Type)	Allen D. Hertz	Registration No. (Attorney/Agent)	50,942

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 3.

PTO/AIA/01 (08-13)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [■] The attached application, or
- [ ] United States application or PCT international application number _____ filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Ehud Mendelson Date (Optional): May 16, 2014

Signature: /Mendelson/

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
Mr.	Ehud		Mendelson	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Coral Springs	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	11190 Heron Bay Blvd		
Address 2			
City	Coral Springs	State/Province	FL
Postal Code	33076	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	31877		
Email Address	Patents@AllenHertz.com	Add Email	Remove Email

Application Information:

Title of the Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS		
Attorney Docket Number	MEN-14-002	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	13	Suggested Figure for Publication (if any)	

Filing By Reference :

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☒ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	31877		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Division of	14285209	2014-05-22
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
14285209	Division of	12930735	2011-01-14
Prior Application Status	Patented		Remove

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12930735	Division of	11396843	2006-04-03	7899583	2011-03-01

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11396843	Claims benefit of provisional	60670097	2005-12-04
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Division of	13135421	2011-07-05
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
13135421	Division of	12932811	2011-03-07
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12932811	Division of	12069899	2008-02-13	7924149	2011-04-12

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12069899	Division of	11472706	2006-22-06
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11472706	Division of	11429864	2006-08-05
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11429864	Claims benefit of provisional	60678947	2005-05-09
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Division of	12587042	2009-10-01
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
12587042	Division of	11429864	2006-08-05
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11429864	Claims benefit of provisional	60678947	2005-05-09

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

Mailing Address Information For Applicant:			
Address 1			
Address 2			
City		**State/Province**	
Country[i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1			
Address 2			
City		**State/Province**	
Country[i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	MEN-14-002
	Application Number	
Title of Invention	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS	

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature				Date (YYYY-MM-DD)	2014-05-22
First Name	Allen D.	Last Name	Hertz	Registration Number	50942

Additional Signature may be generated within this form by selecting the Add button.

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
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U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

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Application Number	Not Yet Assigned
Filing Date	Filed Herewith
First Named Inventor	Ehud Mendelson
Title	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	MEN-14-002

SIGNATURE of Applicant or Patent Practitioner

Signature		Date (Optional)	May 22, 2014
Name	Allen D. Hertz	Registration Number	50,942
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ *Total of 1 forms are submitted.

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I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

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OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

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Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

☑ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☐ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	/Ehud Mendelson/	Date (Optional)	May 16, 2014
Name	Ehud Mendelson		
Title	Inventor		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

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NONPUBLICATION REQUEST UNDER 35 U.S.C. 122(b)(2)(B)(i)

First Named Inventor	Ehud Mendelson
Title	INDOOR AND OUTDOOR MAPPING AND NAVI
Attorney Docket Number	MEN-14-002

I hereby certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

I hereby request that the attached application not be published under 35 U.S.C. 122(b).

Signature	May 22, 2014
	Date
Allen D. Hertz	50,942
Typed or printed name	Registration Number, if applicable
561-716-3915	
Telephone Number	

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing.**

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

If applicant subsequently files an application directed to the invention disclosed in the attached application in another country, or under a multilateral international agreement, that requires publication of applications eighteen months after filing, the applicant **must** notify the United States Patent and Trademark Office of such filing within forty-five (45) days after the date of the filing of such foreign or international application. **Failure to do so will result in abandonment of this application (35 U.S.C. 122(b)(2)(B)(iii)).**

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INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

RELATED APPLICATIONS

[0001] This application is:

a Divisional Application of U.S. Patent Application Ser. No. 14/285,209 filed on May 22, 2014,

which is a Divisional Application of U.S. Patent Application Ser. No. 12/930,735 filed on January 14, 2011,

which is a Divisional Application of U.S. Patent Application Ser. No. 11/396,843 filed on April 03, 2006 (now US Patent 7,899,583 on March 01, 2011),

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/670,097 filed on April 12, 2005 (now expired); and

a Divisional Application of pending U.S. Patent Application Ser. No. 13/135,421 filed on July 05, 2011,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/932,811 filed on March 07, 2011,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/587,042 filed on October 01, 2009,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 12/069,899 filed on February 13, 2008 (issued as US Patent 7,924,149 on April 12, 2011),

which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/472,706 filed on June 22, 2006,

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which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/429,864 filed on May 08, 2006,

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/678,947 filed on May 09, 2005 (now expired),

a Divisional Application of pending U.S. Patent Application Ser. No. 12/587,042 filed on October 01, 2009,

which is a Divisional Application of pending U.S. Patent Application Ser. No. 11/429,864 filed on May 08, 2006,

which is a Non-Provisional U.S. Patent Application claiming the benefit of U.S. Provisional Patent Application Ser. No. 60/678,947 filed on May 09, 2005 (now expired).

FIELD OF THE INVENTION

[0002] This invention is directed generally to the field of RF beacons. More specifically, the application of a series of deployed RF beacons creating an infrastructure for use in navigation, marketing, emergency situations, transportation, parking assistance, hospitality applications, and the like, wherein the information is displayed upon a map on a user's cellular phone or similar device.

BACKGROUND OF THE INVENTION

[0003] Introduction to location based services:

[0004] Location based services are rapidly expanding. Outdoor location technologies are mainly based on GPS technologies. GPS cannot perform properly indoors and is therefore inadequate. As a result, indoor location systems are appearing on the market.

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[0005] The need for a system arises from various market segments and applications. One example in the market is the GPS based systems that use integrated positioning and navigation systems based on GPS receivers as the primary positioning technology. Subsequent to the events of September 11th' the Federal government mandated that GPS capability be built in to all cellular phones. However, the fact that uninterrupted satellite reception is not possible in many locations is a major limitation of GPS based systems. Densely populated areas and radio-frequency-signal shadowed locations, such as urban centers (a.k.a. "urban canyons"), generally do not allow proper operation of GPS, yet it is in these locations that the need is greatest.

[0006] There is a clear need for a cost effective system that maintains performance indoors, in urban canyons and in city centers.

[0007] Another important consideration is that GPS itself is susceptible to jamming and other man-made interference.

[0008] Description of GPS System:

[0009] The Global Positioning System (GPS) is a satellite- based navigation and time transfer system developed by the U.S. Department of Defense. GPS serves marine, airborne and terrestrial users in the military as well as civilians. Specifically, GPS includes the Standard Positioning Service (SPS) that pro- vides civilian users with 100 meter accuracy as to the location or position of the user. For military users GPS provides the Precise Positioning Service that is accurate to within 20 meters. Both of these services are available worldwide with no requirement for any local equipment.

[0010] View of GPS limitations:

[0011] First limitation of GPS is that upon activation the GPS receiver scans for signals from the GPS satellites. A unit must locate and receive signals from at least four satellites to be able to determine its location. This process of locating the satellites, receiving the data and achieving a position fix can take several minutes. This delay is problematic for many GPS applications.

[0012] Second limitation of GPS is that the receiver needs a clear view of the sky to successfully receive signals from the satellites, again under unfriendly RF conditions such as

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inside buildings, or in "urban canyons" or in the shadows of high buildings, the GPS suffers from multi-path effects and therefore shows poor performance or none at all.

[0013] Third Limitation-limited accuracy: There is a problem of limited accuracy of the civilian GPS signal. While knowing your position to within 50 to 200 feet anywhere on the planet is a major technological feat, it is still not accurate enough, to locate and navigate to an a store in a mall or to empty parking space, where each space measures about 10 feet, and most indoor store/malls are located where the GPS cannot work effectively.

[0014] Existing navigation systems, such as the new mandatory GPS equipped cellular phones, are based on GPS and have the aforementioned limitations.

[0015] Another significant factor adding to the limitations of the GPS based systems is the important role of map production; normally a user requires a map to be as detailed and as up-to-date as possible. The existing maps used by the GPS based systems provide limited detail and are not able to reflect changes on a real time basis, more over there is no mapping for indoor facilities at all. The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[0016] The Proposed Solutions:

[0017] In general, the subject invention is based on applying machine-learning techniques to the task of inferring aspects of the user's status from a stream of input from Small RF tags/beacons are installed in local area indoor or outdoor or in places designated as Point Of Interest (POI), be it at a mall, department store, product inside a store, street or garage parking, inside or outside location, public or commercial, The tags/beacons can be RFID (long range type), or a Bluetooth with the option to long range Bluetooth, or a Wi-Fi or any RF type. The tags/beacon broadcast a unique ID by wireless that identifies the location by the unique ID, the address and type of facility/store/product. The tag/beacon broadcasts its information to be picked up by the mobile phone application, via the cellular phone or other Bluetooth device with application.

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[0018] The focus of the application for the indoor guide navigation and local based services, or navigation in crowded urban areas, where GPS based systems, due to lack of access to satellites or the GPS limitations detailed previously, cannot achieve the required results.

[0019] The disclosed applications focus on the task of interactively guiding the user to a desired indoor destination.

[0020] Examples of indoor applications:

[0021] The user may wish to locate an empty available parking space in his vicinity.

[0022] The user may wish to locate a specific store in a shopping mall, or a particular aisle in a department store, or a specific item on a shelf.

[0023] The user may wish to locate a specific conference room in a convention center, or a Point Of Interest (POI) in an amusement park or a Point Of Interest (POI) in a museum.

[0024] The user may be looking for a train location in a station, or stops in a subway or underground train system.

PRIOR ART

[0025] At present, however, no prior art device utilizes the capabilities to display a real-time representation of navigating directly from the sensors without a central system; and without using a GPS based system directly to the "user". Also most systems are designed for the old query type search where interface to Internet and or database to a central system is needed

[0026] The navigation system automatically detects a signal directly from the bacon, no communication needed not even cellular communication to do the determination of the location where is other systems must have bandwidth available, over which to send a request to a central system, or to a database, and then must wait for a response. This takes time!

[0027] Even if the other systems have bandwidth, they are still based on the existing search concept where the user submits a query, searches and waits for the response. This is impractical.

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The subject system provides the information automatically, without submitting any query, and the response is according to the user's location, wherein the user's location is determined by proximity to the beacon in the local area.

[0028] Again, most of the existing prior arts are based either on a GPS based system or the existing car navigator, that depends on a GPS too. And the existing mapping that these systems use has the same limitations described previously and is impractical.

[0029] The present invention bridges the gap between the GPS based navigation and provides a complete solution.

[0030] Patent U.S. Pat. No. 7,031,875 Ellenby et al. describe a pointing system for addressing objects, provide a system and method based on GPS and Internet/database communication, it is not exactly a navigation but an information based system that needs the GPS to locate the user location so indoor services is likely out of the questions and the need for communication as well with GPS limits its availability and accuracy.

[0031] The system, as provided by the present invention, determines the location using the beacon/tag ID, Proximity Detection (PD), and Received Signal Strength (RSSI), Time of Arrival (TOA)=and Angle of Arrival (AOA).

[0032] Proximity Detection (PD)

[0033] This method relies upon a dense grid of antennas, each having a well-known position. When a mobile device is detected by a single antenna, it is considered to be collocated with it. When more than one antenna detects the mobile, it is considered to be collocated with the one that receives the strongest signal.

[0034] This method is relatively simple to implement. It can be implemented over different types of physical media. In particular, IR and RFID are based on this method.

[0035] Triangulation

[0036] In case more than one beacon/tag signal a Triangulation takes PD a step further, in the sense that it is based on measuring the signal level measurements from each antenna (possibly by

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using a triangulation mechanism), with respect to each mobile device. Following that, mobile is located by using a triangulation algorithm.

[0037] Like the PD method, triangulation is relatively simple to implement.

[0038] Time of arrival (TOA)

[0039] Time of arrival (TOA)is based on triggering the mobile devices to respond, and measuring the time it takes for the response to fly back to the antenna. The elapsed time represents the distance between the two. By using distances from a few antennas, a mobile's position can be triangulated. TOA is considered to be the most accurate method, because multi-path effects can be filtered out. Yet, it is considerably more complex to implement, as it requires a modification to the hardware on the mobile side, as well as special modifications on the antenna side.

[0040] Angle of Arrival (AOA)

[0041] Angle of Arrival (AOA) is based on finding the direction of maximal signal intensity for each antenna-device pair. By finding the intersection of several such direction vectors, a mobile's position can be estimated AOA is considerably less accurate than TOA, due to limited angular resolution and the fact that indoors much of the signal is reflected. Also, AOA antennas are more complex, as they require multi-section, highly directional antennas, and multiple RF circuitries.

[0042] Bluetooth is a newer wireless local networking standard that operates in the 2.4 GHz ISM band. and the range is shorter (typically 10-15m, although there are tags with a range of over 300 feet). On the other hand, Bluetooth is a "lighter" standard, highly ubiquitous (embedded in most phones, PDAs, PC peripherals, etc.) and supports, in addition to IP, several other networking services. Notably, Bluetooth supports serial port emulation, voice, and various types of object exchange. Bluetooth tag/beacons are small, pocketsize transceivers.

[0043] Every Bluetooth device's tag/beacon has a unique ID. This ID can be used for locating the tag/beacon and providing location information of the mobile device in the proximity.

Google Ex. 1029, p. 452

[0044] The relevant location scenario of the present invention is that of searching for a certain tag. It is the most accurate and the faster response time and it is this method in indoor navigation and locating when and where each tag/beacon ID is a known address position-waypoint.

[0045] Why use Bluetooth for indoor location?

[0046] Bluetooth has some advantages in the context of indoor location. These include:

[0047] Bluetooth uses RF-in the 2.4 GHz ISM band, specifically. In this frequency range, radio waves penetrate obstacles, such as walls and human bodies, albeit with a substantial loss.

[0048] This has two implications:

[0049] Availability of a "high-there" application is always some signal received from the tags/beacons.

[0050] Tags/beacons can be placed relatively far apart (typical range is 10-15 meters, i.e. not necessarily of one in each way point).

[0051] Bluetooth is ubiquitous-Bluetooth chipsets are being implanted everywhere nowadays (phones, accessories, computing devices, etc), the tags/beacon can be implements anywhere, inside buildings roads inside cars transportation entities, inside home for home automation triggering, or in any kind of business triggering application or and link to exiting system .

[0052] The fact that a Bluetooth location system can locate any Bluetooth enabled device, makes it more cost-effective. This means that an increasing fraction of humans and mobile assets around would become locatable in a Bluetooth covered site, with no additional hardware cost (no tags/beacons attached). The only need is to pre-register these devices. Bluetooth is a low power technology-tags need recharge, approx. once a week (or longer, depends on the usage scenario). Non-tags (e.g. BT enabled phones) are being recharged anyway on a regular basis, so they do not need special recharges. If they are being used for location, the fraction added to their usual (no Bluetooth) power consumption is relatively small.

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[0053] Bluetooth is a low cost technology, having expected high production volumes (hundreds of millions annually) lead to sub-$5 per chip. It is noted that several IC manufacturers have already met this goal. This would eventually result in a low price for the Bluetooth tags/beacons, if and when Bluetooth location systems would become sufficiently ubiquitous. Bluetooth is a multi-functional communication standard - location is only one of the services that can be supported by a Bluetooth infrastructure. The same infrastructure can be used to provide additional network services, particularly remote monitoring and control or just trigger link to exiting system. In addition, Bluetooth provides voice and IP services (although for the later, WLAN is typically more suitable).

[0054] In open spaces, relatively free of obstructions and walls (e.g. a large warehouse or a public hotspot), Bluetooth alone would suffice to provide a -2 meter error range.

[0055] Conclusions

[0056] The proposed beacon technology offers unique advantages: one is the ability to locate ubiquitous "any tags" (any Bluetooth enabled device can be associate and be use the advantage of the Bluetooth beacons, e.g. most of the newer mobile phones). The other advantage is the multiservice nature of the Bluetooth beacons infrastructure that enables using the tags/beacons for other purposes, such as for locating and navigating, remote monitoring and control, trigger existence and link to existing systems and software and for a variety of local based services and local push messaging services.

SUMMARY OF THE INVENTION

[0057] In accordance with the present invention, these are the navigation project's characteristics:

[0058] The proposed system is a locating and navigation method based on the following unique characteristics:

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[0059] In an indoor or outdoor navigation situation the RF beacons tags, replace the satellite in a GPS based system, to provide the user with the information and directions needed to reach the destination.

[0060] The proposed system has three major parts:

[0061] The detection and navigator, the special method used to display the data and the information from the area trigger as result of being in close proximity to the RF beacons in the area.

[0062] It is not a location and tracking system as offered by other systems.

[0063] Small RF tags/beacons are installed in each place designated as Point Of Interest (POI), be it at a mall, department store, product inside a store, street or garage parking, inside or outside location, public or commercial. The tags/beacons can be RFID (long range type), or a Bluetooth with the option to long range Bluetooth, or a Wi-Fi or any RF type. The tags/beacon broadcast a unique ID by wireless that identifies the location by the unique ID, the address and type of facility/store/product . The tag/beacon broadcasts its information to be picked up by the mobile phone application navigator, via the cellular phone or other Bluetooth device with application, the beacon ID trigger application and push information to the Bluetooth device or the cellular phone with the Bluetooth.

[0064] The system can serve as add on to the mall's/store's guide/mapping to provide extra assistance to user.

[0065] The navigator.

[0066] The navigator, cellular phone application Bluetooth application

[0067] The user device scan the local area for ID broadcast by the tags/beacons in the vicinity via the wireless Bluetooth interface with a cellular telephone utilizing the cellular phone's Bluetooth capability. It is important to note that no cellular communication or Internet or database access is needed to determine the location of the device and that any Bluetooth enabled device will operate the navigation application as a stand-alone device. The beacon system can interface with existing in car system and/or car navigation system.

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[0068] The display method.

[0069] The display method is a unique way to bridge existing devices like cellular phones, in-car system and in-car navigation and other Bluetooth devices. The system provides an overlay display method over the existing navigation system mapping or floor map or floor images, as a real-time floating display, or as a waypoint to overcome the limitations of GPS based systems and the existing mapping systems, the indicator placed overlay on the floor plan image, it may further include providing a visual indication a circle on the floor plan image of the path, wherein the visual indication – the circle indicates an area of the indoor map where the location information identifies a particular location and the circle provides the accuracy radius circle.

[0070] The mapping: a system and method for mapping an indoor environment is provided. a user device may receive an indication of a starting point on a floor plan.

[0071] The user device may prompt the user to travel in a particular direction, or the direction of travel may be determined by the user device in response to the user indicating a second location after the user has traveled to the second location.

[0072] As the user travels from the starting point in the designated direction, the user device may gather information about the indoor environment. For example, the user device may gather wireless signal strength data, from proximity RF beacons Wi-Fi or Bluetooth while the user travels in the designated direction.

[0073] The user device may associate the gathered information with the path the user traveled from the starting point to the ending point. The operation can be done at the user device – the cellular handheld, the association may also be performed by a remote server using data provided by the user device. As the user travels from point to point, the client device may indicate the area for which valid location information is available based on the path the user traveled and the information the user collected.

[0074] The Mapping can be offered as an additional service for the indoor based on area building floor or image mapping.

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[0075] The navigation system will enable remote planning based on downloaded local floor-plans the floor mapping or floor images – the indoor view images of the local building facility, or local navigation, when the location's floor plan can be triggered to down- loaded at the destination. An example of this would be at the entrance of a shopping mall, a department store, an amusement park, a museum, a parking garage, a downtown area of a city, and the like.

[0076] The navigation system is based on a network of tags/beacons that can be deployed anywhere. The system is accurate to within 10 feet, significantly better existing navigation systems and GPS. The system can work inside a building whereas GPS cannot.

[0077] Local detection is obtained via popular Bluetooth interface.

[0078] The system provides information about each facility/store, including information about the type of the facility, for example: type of store or product etc.

[0079] By providing the ability to locate a the user in an area using a Bluetooth enabled device, or a cellular phone with the navigation application and the RF beacons method, the system overcomes the anxiety of "Where am I "and also facilitates finding a parked car later via the RTP (Return to Parking) feature.

[0080] The system has the capability to perform all the functions of a search for and can become the "Next generation search out of the box".

[0081] The navigation system can be attractive for places that already deploy WI-FI and can be used for the existing WI-FI devices as a tags/beacons.

[0082] In case of an emergency or security situation, the system can provide authorities with information.

[0083] The system eases and facilitates navigation to indoor locations, without a navigation map or GPS. Indoor Mapping can be provided as part of the navigation system. The system provides "local" navigation as well as "remote" detection.

[0084] The system allows easy interface or trigger application with existing networks or existing system.

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[0085] The system saves gas, time, money and eases global warming by reducing the time spent searching for destination.

[0086] The navigation method is unique. The navigation system is based upon RF tags/beacons with interface to Bluetooth enabled devices. This feature allows detection and navigation in locations where GPS cannot work, as well as outside, with the ability to guide the user to within 10 feet of the destination, significantly better than any other navigation and GPS based systems on the market.

[0087] The Bluetooth RF tags/beacons are based on a long-range version of the popular short distance communication. This unique feature affords the user the ability to plan ahead from a remote location, by obtaining ID about the destination directly from the tags/beacons and by accessing the indoor floor plan to be navigated at the destination.

[0088] A major problem with In-Car navigation and GPS mapping is that they cannot guide the user closer than 50 to 200 feet, and only in open places. The navigation system can provide accurate directions to within 10 feet.

[0089] The navigation system will be a challenge to navigation providers and GPS providers as they cannot provide mapping or navigation inside a mall, department store, a parking garage or lot, and anywhere the GPS /Navigation map cannot accurately help navigate.

[0090] Utilizing this innovation, the facilities in the vicinity around the "user" car are displayed on a floating overlay using either a cellular phone application, or a stand-alone device, or an existing installed navigation system with or without any mapping.

[0091] The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[0092] Navigation using the mapping or floor plan of a location can be offered as a part of the system. The option of downloading a floor plan can be exercised either remotely or locally.

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[0093] The tags/beacons broadcast their signal continuously and any of the navigation devices will detect them and display the ID/data on the user's device in an easy to understand method.

[0094] With our innovation you have the information that you want, when you want it, where you want it ...(and at an affordable price)

[0095] Once you are in the vicinity of your destination and you switch on your navigation device, by being in proximity to installed beacons in the area you will automatically receive the facility information along your waking route and in all directions around you.

[0096] No further action is required, there is no need to send a request or to access the Internet/web or log on and search a database or central system the access to the Internet is to provide a local based services like push information or messages or offers, deals, advertising to the mobile user .

[0097] Other systems are still based on the existing search concept where the user submits a query, searches and awaits for the response. All impractical while the user needs the information immediately. The navigation system provides the information automatically, without submitting any query, and the response takes into account the user's location determined by the proximity RF beacons.

[0098] The unique approach to detection of the mobile inside the buildings does not need an Internet bandwidth or cellular communication. The Internet or cellular communication provides local based services and additional information that can be pushed to the user device.

[0099] And as a result there is no delay or waiting for communication and access time, the communication is instantaneous, triggered directly between the tags/beacons ID and the user's device.

[00100] Additionally, each facility type can be ID coded to identify the type of the store etc., e.g. restaurants, men's wear, women's wear etc.

[00101] Each ID-coded display of facility can be trigger accessed to information about the store e.g., providing automatic waypoint information.

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[00102] The ability to operate the innovation using the disclosed applications on a cellular phone, the navigator, with no need for cellular connection to determine the current location, means the user does not need any GPS system.

[00103] Moreover, the navigation system can solve the "RTP" (Return to parking) problem, where many forget where they parked their car. The system has an option to save the location on the "cellular phone-parking detector" application that will make it easy to locate the parked car.

[00104] The navigation solution is designed for global use and is not limited to malls, stores, amusement parks, museums, sports stadiums etc. It can be implemented in parking garages or parking spaces metered or not, the tags/beacons can be implemented anywhere and in any place to trigger and initiate existing and local application and even link to exiting system and existing software.

[00105] It is envisioned that in the future all new construction will have the tags/beacons included in the design, even place addresses, a building addresses can be replaced or use an add-on with the implementation of a tags/beacon in the area to be recognized or scanned by the mobile device.

[00106] The system integrates the navigation as part of the NAV4 concepts where it will provide complete solutions for local navigation in an area where the GPS can't work.

[00107] The navigation system consists of the following parts:

[00108] An infrastructure of tags/beacons, wherein each tag/beacon is installed in a local and known location.

[00109] The navigation system is based on mapping and navigation to and in the location, and its aim is to replace or supplement the mall/store guide/map, by installing the tags/beacons in each store or Point Of Interest (POI).

[00110] The mapping: As GPS and GPS mapping is not available indoors, the navigation system is based upon the floor plan mapping or floor images available from each facility. For planning ahead, the floor plan or the floor images can be downloaded as part of user's

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navigation/cellular phone remotely-via Internet as mobile application before reaching the destination or triggered when the destination is reached.

[00111] The Navigation uses the most commonly used device in the world today, the cellular phone with Bluetooth interface.

[00112] As a difference from other systems and other local based systems, this solution offers a unique approach that can be described as the "Search out of the box" as neither query nor database search is needed; all needed is to know the proximity tags/beacons ID and the cellular phone, working as a Bluetooth device, that automatically scans and recognizes the local area tags/beacons and determines the "user's" location, and provides instant information to the user and to the business in the area.

[00113] A typical application is guide and navigating a pedestrian in an environment like a mall, department store, specialty store, conference, trade show, amusement park, university, hospital, school, municipal building, museum, subway, train station, airport, down town center, a finance facility, cruise ship and any type of parking facility ...or any place when and where GPS cannot be provided or is not accurate or precise enough. The system will be used for navigation by first responders to emergencies or disasters.

[00114] The navigation system is part of the broad suite of applications that include a complete solution to the "user" from the time that he parks, or begins looking for a space to park his car, walking to the store/mall or to any indoor facility to when he wants to return to his parked car, looking for the place that he parked.

[00115] The suite may includes:

[00116] Parking detector-and navigation to the empty available parking space.

[00117] Automatic notification of user existence in the place/store/facility

[00118] Nav4 mall/store navigation solution inside mall/store.

[00119] RTP-return to parking-locate the place that you parked your car.

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[00120] For example, a typical application could be:

[00121] A pedestrian asks the way in a mall to a specific store.

[00122] A pedestrian asks the way inside the store, to a specific aisle or product.

[00123] A shopper in a department store asks for a specific department.

[00124] A pedestrian asks the way to a Point Of Interest (POI). In an emergency, the first response team has to navigate inside a smoke filled building.

[00125] A store owner can use the notification and the knowledge of existence for loyalty and rewards

[00126] The beacons ID can trigger a link to exiting software and aware the local system of the user existence – such as:

A traveler is check in into a hotel/resort, the hotel/resort can provides with automatic check-in and interface to the hotel/resort front system.

A traveler is check-in into a flight in the airport, the airline provides the traveler with automatic check in to the flight when the traveler reach close proximity to a RF local beacon.

A customer are check into a restaurant or food service, the business will recognize the customer when he in proximity to the local RF beacon.

The pedestrian reach an advertising area or billboard that can recognize the user by being in a close proximity to the advertising area and provide the user with customize personalize advertising or offer.

A customer is entering a store/bank/facility front would be identified/recognized for additional information or services.

The RF beacons/tags can serve to track employee time, including check-in and checkout times from designate area.

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The RF beacons/tags can serve as part of payment process where the user mobile and the local proximity beacons/tags can provide additional security for a mobile payment system to replace a current payment method such as those using credit cards.

The local RF beacons associate with the user mobile can be part of local dating system.

The local RF beacons with associate with the user mobile can create virtual secure zone for child or elderly or any care monitoring.

The location of the user as associate with the local beacons can be interface with social networking .

The RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking.

The RF beacon can be installed or be a part of a vehicle to provide car application like payments security car broadcasting car tracking car communication and automatic car counting to provide transportation managements with statistically information automatically.

[00127] A system and method to provide a user information which is related to the Point Of Interest (POI), the navigation system provides detection and navigation reference, position determination and information related to the object-Point Of Interest (POI), directly and automatically to the user interface-cellular phone upon arriving to a close proximity to the RF tags/beacons installed in the area.

[00128] Special operation mode: Shopping: provides navigation to the special sale item in a department store.

[00129] Special operating mode: Museums: provides navigation and interactive information from the museum's exhibition to the "user's" cellular phone device via Bluetooth interface.

[00130] Special operating mode: Parking: describe in 2 patent applications, provide empty parking space detection and navigation.

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[00131] Special operating mode: Nav store provides navigation inside a store/department store to a specific department/aisle or specific product, with an option for advertising method and special promotion it also provides the business owner with ability to know, in a way of automatic notification when the "user" cellular phone device is in proximity to the local area for automatic delivery of information related to the store/business owner such information can be but is not limited to deals, coupons, special and even statistically information about the "user" habit.

[00132] Every Bluetooth device's tag/beacon has a unique ID. This ID can be used for locating the tag/beacon and providing location information of the mobile device in the proximity.

[00133] A relevant location scenario is that of searching for a certain tag. The relevant location scenario is the most accurate and the faster response time and is one solution for indoor navigation and locating when and where each tag/beacon ID is a known address position-waypoint.

[00134] Why use Bluetooth for indoor location?

[00135] Bluetooth has some advantages in the context of indoor location. These include:

[00136] Bluetooth uses RF-in the 2.4 GHz ISM band, specifically. In this frequency range, radio waves penetrate obstacles, such as walls and human bodies, albeit with a substantial loss.

[00137] This has two implications:

[00138] Availability of a "high-there" application based upon receipt of a signal from the tags/beacons.

[00139] Tags/beacons can be placed relatively far apart (typical range is 10-15 meters, i.e. not necessarily of one in each way point).

[00140] Bluetooth is ubiquitous-Bluetooth chipsets are being implanted everywhere nowadays (phones, accessories, computing devices, etc), the tags/beacon can be implements anywhere, inside buildings roads inside cars transportation entities, inside home for home automation triggering, or in any kind of business triggering application or and link to exiting system.

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[00141] The fact that a Bluetooth location system can locate any Bluetooth enabled device, makes it more cost-effective. This means that an increasing fraction of humans and mobile assets around would become locatable in a Bluetooth covered site, with no additional hardware cost (no tags/beacons attached). The only need is to pre-register these devices. Bluetooth is a low power technology-tags need recharge, approx. once a week (or longer, depends on the usage scenario). Non-tags (e.g. BT enabled phones) are being recharged anyway on a regular basis, so they do not need special recharges. If they are being used for location, the fraction added to their usual (no Bluetooth) power consumption is relatively small.

[00142] Bluetooth is a low cost technology anticipating high production volumes (hundreds of millions annually) leading to sub-$5 per chip. Several IC manufactured have already met this goal. This would eventually result in a low price for the Bluetooth tags/beacons, if and when Bluetooth location systems would become sufficiently ubiquitous. Bluetooth is a multi-functional communication standard - location is only one of the services that can be supported by a Bluetooth infrastructure. The same infrastructure can be used to provide additional network services, particularly remote monitoring and control or just trigger link to exiting system. In addition, Bluetooth provides voice and IP services (although for the later, WLAN is typically more suitable).

[00143] In open spaces, relatively free of obstructions and walls (e.g. a large warehouse or a public hotspot), Bluetooth alone would suffice to provide a -2 meter error range.

[00144] Waypoint Navigation

[00145] A waypoint is a fixed location with known address location, longitude and latitude and coordinates. The navigation system is capable of storing a database of waypoints for the following purpose:

[00146] Waypoints mark a destination, a point along the way to a destination, or a point of reference. Normally, in navigating, a "route" consists of one or more waypoints. To traverse a route, the user navigates to the nearest waypoint, then to the next one in turn until the destination is reached. The system has the ability to compute a great-circle route towards a waypoint, enabling them to find the shortest route even over long distances. The system enables users to

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locate a destination on a map or indoor floor plan or indoor image and define it as a waypoint. The system is intended for navigation; it can generate a suggested route between two waypoints, based on the cartographic database. The system indicates the user's current location and gives advance notice of an upcoming point.

[00147] Because the system knows the waypoint positions, and the distance between them, it is easy to determine the "user's" exact location.

[00148] Map Matching

[00149] The navigation solution is further enhanced, although it is not essential, when the system knows that the person or object being located is traveling along known routes on a map; for example, the system can assume that people can only follow certain routes in a mall. This is priority information that can be used to "force" the estimated position to be on the nearest point on the possible routes, note that it is easier to predict indoor than outdoor.

[00150] The constraints of indoor construction similarly can be used to refine estimates of the position of a person or object moving within a building-people and objects do not pass through walls, they pass along corridors and through doorways. It is a best solution for a system in case of an emergency or for a system for homeland security or a system to locate and inform the subway location, a good example is the hotel exit floor map.

[00151] Configuration and Use

[00152] In the indoor application, instead of GPS, the system uses known waypoint positions that are manually detected and identified as a demonstration of the concept of using another sensing method, such as RF tags/beacon, to detect and identify the location and the waypoints. Theoretically, it would be possible to convert the waypoint positions into GPS coordinates and emulate an external GPS data source.

[00153] This system can be useful for providing navigation to first responder personnel indoors waypoints have been installed in a particular building in the form of RF tags/beacons whose identities are associated with locations- the meaning of identifier, it may be possible to associate magnetic anomaly information with individual tags as well.

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[00154] One of the important features of the indoor navigation techniques will enhance the ability of tactical team's first response team to navigate within the buildings in which it has been deployed. RF (Bluetooth) Tag/bacon devices commonly are attached to persons or to moveable objects, so that the objects can be tracked using fixed readers (special- purpose radios) at different locations. This is the most common indoor navigation that exists today.

[00155] The navigation method is the "flip side" of this practice and is based on the concept that the detection of an RF (Bluetooth) device, or RF Tags/beacon, in a known, fixed location, by a moving reader, such as a Bluetooth enabled cellular phone or other Bluetooth enabled device, provides a precise location of a person or a moving object, by the carrier of the telephone or device, who can supply indoor navigation without GPS.

[00156] The navigation method provides a low-cost, reliable system for firefighters and other first responders, inside buildings, to navigate, where a GPS is not reliable-indeed, the GPS signal may have been disabled temporarily to prevent-exploitation by terrorists, or even more likely no signal can be received at all inside a building.

[00157] The navigation system foresees this limitation of GPS based systems, and is intended for an environment that is potentially much less "friendly" to RF signals, the environment inside a building that first responders encounter may contain smoke, dust, or flames, and is intended to leverage advances in RF/Bluetooth tag/beacon technology. The navigation system will exploit the capability of storing critical building information, such as the floor maps and the emergency escape plans, for retrieval and navigational assistance via a Bluetooth enabled cellular phone, when and where it is needed,

[00158] Moreover the navigation system can serve as a navigator for the emergency exit route when and where needed. Each user can load the emergency exit floor plan and escape with the knowledge of his exact location in that route.

[00159] Aspects of the scenarios to be included:

[00160] Identifies and tracks the user (a first response team member)option to use the cellular phone as a beacon by himself.

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[00161] Provides the user with navigation information and directions for safely exiting the building.

[00162] Provides location information of all team members, via an ad hoc network of radio terminals that combine RF/Bluetooth and allow communication chat and messaging between the team members without need for Internet or cell communication such option is not limit to the first response team but to a user in emergency and non-emergency use.

[00163] From the outset, the navigation system was designed with the capability to utilize existing technology so it can be deployed as a stand-alone system, or in tandem a link with existing systems. The system focuses on employing technology that is already in place that simply needs to be expanded.

[00164] With the implementation of the navigation system, a FIRST RESPONSE TEAM will be empowered to navigate and find its way in a case of emergency or a disaster. This capability can be a critical life-saving power in modem congested urban living conditions, not available before now.

[00165] It is believed that the implementation of the navigation system will assist counter-terrorism activities and more importantly will help the first response teams to save the lives of people trapped inside buildings.

[00166] Conclusion

[00167] The Bluetooth technology offers few unique advantages: one is the ability to scan and locate a small tag/beacon installed in an local area using the tags/beacon ID a low cost and battery power and low battery use and the use of the newest Bluetooth devices (any Bluetooth enabled device that is not a tag/beacon, e.g. most of the newer mobile phones) can be used as a tag/beacon.

[00168] The other advantage is the multiservice nature of the Bluetooth infrastructure that enables using the tags/beacons for other purposes, such as for navigating, remote monitoring and control, a triggering mechanism to application and system even a link to existing systems and for a variety of messaging a push information and local based services.

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[00169] Location based services are rapidly expanding. Outdoor location technologies are mainly based on GPS technologies. GPS cannot perform properly indoors, and is therefore inadequate. As a result, indoor location systems are appearing on the market.

[00170] The need for a system arises from various market segments and applications. One example in the market is the GPS based systems that use integrated positioning and navigation systems based on GPS receivers as the primary positioning technology. Subsequent to the events of September 11th' the Federal government mandated that GPS capability be built in to all cellular phones.

[00171] However, the fact that uninterrupted satellite reception is not possible in many locations is a major limitation of GPS based systems. Densely populated areas and radio-frequency-signal shadowed locations, such as urban centers (a.k.a. "urban canyons"), generally do not allow proper operation of GPS, yet it is in these locations that the need is greatest.

[00172] There is a clear need for a cost effective system that maintains performance indoors, in urban canyons and in city centers.

[00173] The disclosed application includes finding a solution to this task by providing a system and method to generate automatically the waypoint along the user route ether indoor, or outdoor.

[00174] The disclosed application addresses the task of interactively guiding the user to a desired indoor and outdoor destination.

[00175] The method for mapping an indoor environment is provided. A user device may receive an indication of a starting point on a floor plan. The user device may prompt the user to travel in a particular direction, or the direction of travel may be determined by the user device in response to the user indicating a second location after the user has traveled to the second location.

[00176] As the user travels from the starting point in the designated direction, the user device may gather information about the indoor environment. For example, the user device may gather

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wireless signal strength data, from proximity RF beacons Wi-Fi or Bluetooth while the user travels in the designated direction.

[00177] The user device may associate the gathered information with the path the user traveled from the starting point to the ending point. The operation can be done at the user device – the cellular handheld, the association may also be performed by a remote server using data provided by the user device.

[00178] As the user travels from point to point, the user's device may indicate the area for which valid location information is available based on the path the user traveled and the information the user collected.

[00179] The method may include displaying a floor plan image or floor mapping or the floor indoor view – the floor images corresponding to an indoor location, receiving a first input to indicate a first location on the floor plan image, gathering initial location information at the first location, and generating an indoor map, using a processor, using the initial location information wherein the indoor map includes an association of the initial location information with the first location.

[00180] The method may further include repeating the location information gathering process at a new location to associate new location information with the new location in the indoor map.

[00181] The method may include gathering additional location information as the user travels from the first location to a second location, receiving a second input to indicate the second location on the floor plan image, determining a path from the first location to the second location, and associating the additional location information with at least one location within the map corresponding to the path.

[00182] The method may include prompting the user to walk in a straight line when traveling from the first location to the second location.

[00183] The method may include providing instructions to a user to travel in a particular direction. The location information may be wireless signal data associated with one or more RF

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wireless beacons installed in the local area. The first input may include performing a selection operation with an indicator placed on the floor plan image.

[00184] The method may also include providing a visual indication on the floor plan image of the path. The visual indication may indicate an area of the indoor map where the location information identifies a particular location. The building floor plan may be received from a remote via Internet or cellular communication as part of the mapping and navigation application.

[00185] The method may also include determining an approximate location determine by proximity to the RF beacons, providing the approximate location to the remote server, receiving a list of floor plans associated with indoor environments proximate to the approximate location, and selecting the building floor plan from the list.. The method may include identifying the user's direction of travel by at least one of determining a relative orientation using the first location and the second location, or using at least one of an user device built-in sensors, accelerometer, a gyroscope, or a compass.

[00186] The method may include determining a location precision for the data gathering operation, and using the location precision to determine a location resolution for the indoor map. The location precision may be determined using a number of available RF wireless beacons for which signal strength data and the beacons ID are available. The location precision may determine at least one of the size of an indicator for indicating the current location or the accuracy radius circle, or the width of a stripe for indicating an area of the indoor map for which the location information has been gathered and will display overly on the floor map image map building map. The method may include determining a coverage level of the indoor map compared to the floor plan images.

[00187] The navigation system and method automatically updates waypoints, when each Point Of Interest (POI) will have an RF tag/beacon that will broadcast an RF ID signal that will provide an instant detection, the navigation system will execute the specified file/program that will trigger automatically, executing a waypoint generation program.

[00188] For some years, local governments in cooperation with various FM radio stations and recently a navigation system have been putting together an automated way to get real-time traffic

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data into cars so drivers can avoid traffic. Real time traffic information includes news such as: congestion, construction, traffic accidents, recommended alternative routes, recent navigation systems depend on fix sensors or camera and some navigation on manual information provided by the users/drivers.

[00189] A tag/beacon will be installed at the location or at each Point Of Interest (POI). The tag/sensor will broadcast RF signal contain ID to be recognized by the mobile phone and such information (the RF beacon ID) will transfer automatically via the user mobile phone to the provided location detection of the user as well as statistically information about the possible "traffic" in the area/road, such method can be extremely helpful to manage and control transportation system.

[00190] The "user" will no longer need to enter his way- points manually and then wait for the providers of maps or GPS to update their maps with the information (this can take about a year in some cases). This way the "user" will receive the information that he needs when he needs it and where he needs it upon entering an area with tags/beacons, providing an automatic "check-in" to the user and the facility business.

[00191] Again, no communication is need to be established between the tags/ beacon and the user mobile device and the detection can be done without any communication at all, In the event that more information is required it may be necessary to connect to the Internet website.

[00192] It is believed that sooner or later it will be a standard procedure to install a tag/sensor on every location of interest (waypoint) or any place on road indoor and even outdoor or any business will provide waypoint information to the "users". Most stores or POI/waypoints will be willing to pay for a tag/beacon or pay subscription fee to be on the mapping system on the local area that will show their location and information on a map. Or they will pay for an annual listing (similar to the yellow pages).

[00193] The System can interface with existing GPS mapping outdoors as well as indoors, it can switch automatically where the user outdoor to receive an outdoor map and information based on GPS and when in the indoor to receive an indoor mapping and indoor navigation based on RF beacons detections.

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[00194] Presently GPS providers, map providers and search engines provide: City Navigator and Metro Guide Maps that contain many thousands of attractions.

[00195] These include: Food and Lodging, Attractions, Entertainment, Shopping, Services, Transportation, Emergency, and Government offices. In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be very old and the information associated with them is not update. Listed Attractions include theme parks, museums, libraries, schools, parks and such. This feature is very useful in an unfamiliar area.

[00196] Waypoints will be located automatically in the local area and plotted on the map screen. The waypoints can be stored on the local map at the handheld phone for future access.

[00197] The navigation system will revolutionize the GPS based systems and the mapping industry, from GPS, mapping companies' communication providers, car manufacturers to yellow pages and local guides; for the first time the user of a GPS navigation system will have an easy, reliable way to reach a destination inside buildings facilities – the indoor world.

[00198] The most common problem with today's GPS based systems is indoors where the navigation and mapping is not existing. The navigation system provides the solution for this problem. Using the navigation system, the user will know where he is, be able to identify "landmarks" around him accurately, and receive automatic updates directly from the Points Of Interest (POI) in the vicinity that get automatic notifications about his presence in their area.

[00199] The navigation system is based on RF tag/beacons, each tag or waypoints has its own ID (identifying the waypoint by type, address, etc.). The beacon will broadcast, via RF the ID to be scan and pickup by the Bluetooth device, provides a detection and trigger a location determination as a floating information display on the indoor map referenced to the user's location. The floating display will provide automatic waypoint updates around the local area and will allow the user to search local providers (waypoints/store), even without any connections, no communication, Internet, or cellular is needed to determine the location as well as accuracy radius circle. The Internet web communication provides more information such as push

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notification and messaging and local based services such as deals, advertising directly and automatically to the user's mobile phone.

[00200] Once you are in the vicinity of your destination and, a notification is sent automatically to the business Internet or web site and you will automatically receive the facility information along your waking route and in all directions around you .

[00201] No further action is required, there is no need to send a request or to access and search a database or central system.

[00202] Other systems must send a request to a central system, or to a database, and then must wait for a response. This takes time!

[00203] The disclosed unique approach results in no delay or waiting for communication or authentication and access time as there is no real communication between the tags/beacons and the user mobile device, the result are instantaneous association, directly between the tags/beacons and the user's mobile or navigation device

[00204] The RF tags/beacons broadcast their ID to be scanned and pickup by the user's mobile phone to identify the location of the user as proximity to the tags/beacon.

[00205] Additionally, the ID identifies the type of facility, store etc., e.g. restaurants, men's wear, women's wear etc. and the location in the store, e.g. front, back etc.

[00206] Each facility can provide information about the store e.g., automatic waypoint information as the user's presence triggers initiates automatically notifies the business or waypoint in the local area.

[00207] Do to the limitation of the mapping system currently used by the GPS navigation system the associated display method is our unique way to bridge existing devices like cellular phones, in-car navigation and other Bluetooth devices. The system provides an associated overlay navigation display method as a real-time floating display, or as a waypoint to overcome the limitations of GPS based systems and the existing mapping systems; especially indoors where each waypoint will be displayed over mapping or floor map images.

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[00208] The display method is one unique way to bridge existing devices like cellular phones, as a real-time floating overlay on a directional circular display to overcome the limitations of GPS based systems and the existing mapping systems.

[00209] The overlay add-up device/display works like a VOR and provides add-up display shows automatically the user location in the immediate area in a circle represent a radius of accuracy and proximity distance from the local detect beacon/tag.

[00210] The overlay displays over an existing navigation system, portable device or cellular phone without GPS support providing a circle that shown the location accuracy of the user on the local map.

[00211] The fact is: no digital maps are entirely accurate. A user needs to know which map makers are used by the product that they are interested in and check the maps for the area that they are concerned about. In addition some map databases are created from vector data while others are just scanned copies of paper maps. In addition to mapping data these same map makers can often provide Points Of Interest (POI) data. However, a software company might use the maps from one company and the poi data from another. POI data normally takes three forms. One is public buildings, parks, airports, and possibly geographic objects. A second is government locations that include specialized points lists like marker buoys, and airplane markers. Finally, there are commercial establishments that usually include some information about their product and contact data. Note that the location of commercial places is often derived from the street address and is not based on the actual lat/Ion location. Moreover there is the sky-high cost of digitizing and updating the poi and the waypoints.

[00212] The task is to provide a solution when the "user" will receive real-time Point Of Interest (POI) or waypoints in the area where he is automatically associate with a located proximity beacons/tags in the area, the waypoints information can be information that are real-time information updates in real-time and can be changed according to the waypoints and all according to a proximity detection of the RF tags/beacons ID in the area, the information can be used in these example applications:

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[00213] The user may wish to locate an empty available parking space in his vicinity. Just think of the empty parking spaces as waypoints the parking space occupied with RF beacon and sensor to find if the parking is empty, and the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details with US Patent 7,899,583 (included in the claim of priority and issued to the Applicant and incorporated herein by reference).

[00214] The user may wish to see and locate the real estate property available in his area according to his location, where an RF beacon can be installed in each real estate property to trigger more information to the user/ possible client when he reach proximity to the property.

[00215] The user may wish to locate a specific store in a shopping mall, each store in a mall is a waypoint, or a particular aisle in a department store, or a specific item on a shelf.

[00216] The user may wish to locate a specific conference room in a convention center, or a Point Of Interest (POI) in an amusement park or a Point Of Interest (POI) in a museum.

[00217] The user may wish to find the emergency exit route in a time of emergency or the first response team needs to navigate in a facility in an emergency situation.

[00218] The user may be looking for a train location in a station, or stops in a subway or underground train system. All of that is updated waypoints in real-time.

[00219] It is believed that the automatic waypoint updates revolutionize the GPS and Navigation Industry.

[00220] For the first time the user will know what he wants and when he wants and according to his location

[00221] The local business owner can introduce his content in real-time to the (navigation) users in his area automatically when the user access or enter to his store the contents can be deals, coupons, specials and provides more information to user about the business, the business in turn can benefit from statistically information about the client/s. such as habits, profile, loyalty and rewards.

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[00222] The GPS and navigation industry can tap to the huge local advertising market (estimated at 134B in US alone ...)

[00223] Automatic notification of user existence in the place/store/facility

[00224] Mall/store navigation solution inside mall/store.

[00225] RTP-return to parking-locate the place that you parked your car.

[00226] For example, a typical application could be:

[00227] A pedestrian asks the way in a mall to a specific store.

[00228] A pedestrian asks the way inside the store, to a specific aisle or product.

[00229] A shopper in a department store asks for a specific department.

[00230] A pedestrian asks the way to a Point Of Interest (POI). In an emergency, the first response team has to navigate inside a smoke filled building.

[00231] A store owner can use the notification and the knowledge of existence for loyalty and rewards

[00232] The beacons ID can trigger a link to exiting software and aware the local system of the user existence – such as:

[00233] A traveler is check in into a hotel/resort, the hotel/resort can provides with automatic check-in and interface to the hotel/resort front system.

[00234] A traveler is check-in into a flight in the airport, the airline provides the traveler with automatic check in to the flight when the traveler reach close proximity to a RF local beacon.

[00235] A customer are check into a restaurant or food service, the business will recognize the customer when he in proximity to the local RF beacon.

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[00236] The pedestrian reaches an advertising area or billboard that can be recognized by the user by being in a close proximity to the advertising area and provide the user with customize personalize advertising or offer.

[00237] A customer is entering a store/bank/facility front to be recognized for additional information or services.

[00238] The RF beacons/tags can serve to track employee's work times, including a check-in and checkout time from a designate area.

[00239] The RF beacons/tags can serve as part of a payment process, where the user's cellular phone and the local proximity beacons/tags can provide additional security for a mobile payment process, which can be used to replace other current payment methods, such as credit cards.

[00240] The infrastructure provided by local RF beacons can be integrated into a local dating system.

[00241] The local RF beacons with associate with the user mobile can create virtual secure zone for child or elderly or any care monitoring.

[00242] The location of the user as associate with the local beacons can be interface with social networking.

[00243] The RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking. the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details in US Patent 7,899,583 issued to the Inventor and claimed as priority herein.

[00244] The RF beacon can be installed or be a part of a vehicle to provide car application like payments security car broadcasting car tracking car communication and automatic car counting to provide transportation managements with statistically information automatically.

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[00245] A system and method to provide a user information which is related to the Point Of Interest (POI), the navigation system provides detection and navigation references, position determination and information related to the object-Point Of Interest (POI) directly and automatically to the user interface-cellular phone upon arriving to a close proximity to the RF tags/beacons installed in the area.

[00246] Moreover the application provides more than simply an icon.

[00247] At present, no prior art device utilizes the capabilities to display a real-time representation of navigating and get an update directly from the waypoints. Also most systems are designed for the old query type search where interface to Internet and or database central system is needed.

[00248] The navigation system automatically detects a signal directly from the RF tags/beacons installed in the waypoints, no communication needs to be established between the mobile phone and the RF tag/beacon not even cellular communication, and no pairing needed. Other systems must have bandwidth available, over which to send a request to a central system or to a database and then must wait for a response, or they need Internet connections. This takes time!

[00249] Even if the other systems have bandwidth, they are still based on the existing search concept where the user submits a query, searches and waits for the response. This is impractical. The navigation system provides the information automatically, without submitting any query, and the response is according to the user's location based on RF tags/beacons installed in the local area.

[00250] Again, most of the existing prior arts are based either on a GPS based system or the existing car navigator, that depends on a GPS too.

[00251] And the existing mapping that these systems use has the same limitations, described previously, and is impractical.

[00252] This navigation system bridges the gap between the GPS based navigation and provides a complete solution.

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[00253] U.S. Pat. No. 7,031,875 Ellenby et al. describes a pointing system for addressing objects, and provides a system and method based on GPS and Internet/database communication, it is not exactly a navigation but an information based system that need the GPS to locate the user location so indoor services is likely out of the questions and the need for communication as well with GPS limits its availability and accuracy. It is not a real-time update of the waypoints and needs Internet and or central database communication.

[00254] The most common problem with today's GPS based systems is that the mapping and the waypoints are not updated on a timely basis. In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be about 2 years old. The new service like Google Earth provides satellite images that are almost 2 years old and for sure can't provide on-line real-time accurate picture of the existing area and the waypoints.

[00255] The disclosed technology offers a solution to this task by providing a system and method to generate automatically the waypoint along the user route ether indoor or outdoor the update is based on determine location of the mobile device indoor in proximity to installed RF beacons and the update information triggered by the location determination, such method is not exist in today navigation or mapping especially indoor.

[00256] The disclosed technology offers a solution that interactively guides the user to a desired indoor and outdoor destination.

[00257] The navigation system and method automatically updates waypoints, by means of an interface to an existing GPS based system, when each Point Of Interest (POI) will have an RF tag/sensor that will broadcast an RF signal that can be converted to a GPS waypoint, In response to the RF signal (from the tags/sensors,) the navigation system will execute the specified file/program that will trigger automatically, executing a waypoint generation program.

[00258] For some years, local governments in cooperation with various FM radio stations have been putting together an automated way to get real-time traffic data into cars so drivers can avoid traffic. Real time traffic information includes news such as: congestion, construction, traffic accidents, and recommended alternative routes.

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[00259] An RF tag/beacon Bluetooth and or Wi-Fi will be installed at each Point Of Interest (POI). When each Point Of Interest (POI) will have an RF tag/beacon that will broadcast an wireless RF signal with ID that will provide an instant detection, the navigation or the application for local based services system will execute the specified file/program that will trigger automatically, executing a waypoint generation program and at the same time provides the business owner a notification of existence of the user in his vicinity to allow the business to provide the user with relevant messages or offers, more information or push message to the user cellular phone just by being in proximity to the RF beacon .

[00260] The "user" will no longer need to enter his way- points manually and then wait for the providers of maps or GPS to update their maps with the information (this can take about a year in some cases). This way the "user" will receive the information that he needs when he needs it and where he needs it.

[00261] It provides trigger information according to the beacon/tag, directly from the local area business waypoints and to the user's display device, the detection can be done without any communication In the event that more information is required and the business need to provide more information it may be necessary to connect to the Internet, its allow interaction/engagement as proximity to the RF Bluetooth beacon can trigger a specific application functionalities and provides automatic notification "I am here" to the business owner.

[00262] It is believed that sooner or later it will be a standard procedure to install a tag/beacon on every location of interest (waypoint) or any business will provide a waypoint information to the to provide "users" with the information. Most stores or POI/waypoints will be willing to pay for a tag/beacons or pay subscription fee to be on the GPS system providers that are able to show their location and information on a map. Or they will pay for an annual listing (similar to the yellow pages).

[00263] The System can interface with existing GPS.

[00264] Present GPS providers, map providers and search engines providers: City Navigator and Metro Guide Maps contain many thousands of attractions.

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[00265] These include: Food and Drink, Lodging, Attractions, Entertainment, Shopping, Services, Transportation, Emergency and Government offices.

[00266] In most areas, the maps provided are not updated and sometimes provide misleading information. Some of the waypoints listed appear to be about 2 years old. Listed Attractions include theme parks, museums, libraries, schools, parks and such. This feature is very useful in an unfamiliar area. Waypoints will be located automatically in the local area and plotted on the map screen. The waypoints can be stored on the GPS database for future access or store at the user mobile device .

[00267] The navigation system will revolutionize the GPS based systems and the mapping industry, from GPS, mapping companies' communication providers, car manufacturers to yellow pages and local guides; for the first time the user of a GPS navigation system will have an easy, reliable way to reach a destination.

[00268] The most common problem with today's GPS based systems is that the mapping and the waypoints are not updated on a timely basis. The navigation system provides a solution for this problem. Using the navigation system, the user will know where he is, be able to identify "landmarks" around him accurately, and receive automatic updates directly from the Points Of Interest (POI) in the vicinity.

[00269] The navigation system is based on RF tag beacons installed in the local area, each tag or waypoints has its own ID (identifying the waypoint by type, address, etc.). The tag beacon ID and proximity to the RF beacons will allow local detection and interface with existing or indoor application and navigation, GPS based systems, as a floating information display on the GPS map referenced to the user's location. The floating display will provide automatic waypoint updates and will allow the user to search local providers (waypoints/store and more information about the store/business, the detection allows the local business to have an automatic notification about the user whereabouts in proximity to his business and allow him to provide the user with more information about his store/business/deals.

[00270] The fact is no digital maps are entirely accurate. A user needs to know which map makers are used by the product that they are interested in and check the maps for the area that

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they are concerned about. In addition some map databases are created from vector data while others are just scanned copies of paper maps. In addition to mapping data these same map makers can often provide Points Of Interest (POI) data. However, a software company might use the maps from one company and the poi data from another. POI data normally takes three forms. One is public buildings, parks, airports, and possibly geographic objects. A second is government locations that include specialized points lists like marker buoys and airplane marker. Finally, there are commercial establishments that usually include some information about their product and contact data. Note that the location of commercial places is often derived from the street address and is not based on the actual lat/Ion location.

[00271] Moreover there is the sky-high cost of digitizing and updating the poi and the waypoints.

[00272] The task is to provide a solution where the "user" will receive real-time Point Of Interest (POI) or waypoints in the area automatically to his existing navigation system or to his cellular phone, the waypoints information can be a real-time information update in real-time and can be changed according to the waypoints.

[00273] A cellular phone application, which the user will scan the area for exiting RF Bluetooth beacons or Wi-Fi beacons will receive data and more information utilizing the cellular phone's Bluetooth capability.

[00274] The system can trigger application as well as link to existing systems and software. A notification can be sent to a web, email a cloud application or even social network, The navigation system will interface with existing in-car media system and in car navigation systems.

[00275] It is understood that the waypoint or Point of Interest (POI) will be represented by the following suggested ID examples as part of the beacon ID to be recognized by the user Bluetooth mobile device (cellular phone), according to the type of the POI:

ID Code	POI Type	Waypoint Cat. Type	ID Code	POI Type	Waypoint Cat. Type

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32	Food/Restaurants	Food
33	Gas Station	Information
34	ATM/Banks	Finance
35	Department Store	
36	Apparel	Store
37	Sports	Store / Information
38	Books video	Store
39	Jewelry	Store
40	Toys/Photo/Elect.	Store
41	Music	Store
42	Gifts	Store
43	Furnishing	Store
44	Service	Service
45	Computers	Store/Service
46	Hairstyle/Cosmetics	Store/Service
47	Office	Office
48	Security/Police	Service / Emergency
49	Children's program	Service
50	Social Affairs	Religious Service
51	Religion	Religious
52	Phone	Service
53	Travel	Transportation Service
54	Parking	Transportation Service
55	Guest service	Service
56	Library	Service
57	Transportation	Management Service
58	Municipal	
59	Post Office	Service
60	Government	
61	Market	Store/Service
62	Alarm	Emergency
63	Emergency	
64	Hotel resort and cruise ship	
65	Education facility, school, university	

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66 Sport facility, sports arena, stadium

67 Conference and show

68 Amusement park

69 Implements as mail and address

70 Implements in a road as road sign or transportation entity

[00276] Be remember that the ID above is only suggested example, the fact is that part of the beacon ID will be to recognize the Facility/store type the location to provide instant detection and location determination by just being in a close proximity to the RF beacon in the area.

[00277] The navigation system enables remote and local update of the local floor plans and the information about the local area and waypoints business in the area, when the location's indoor application can be triggered to download at the destination. An example of this would be at the entrance of a shopping mall, department store, amusement park, museum, parking garage or the downtown area of a city where a sign or the shopping mall information sign will provides direct information a trigger to download the local application.

[00278] The system can work inside a building whereas GPS cannot. Local detection is obtained via popular Bluetooth interface.

[00279] The system provides information about each facility/store, including information about the type of the facility, for example: type of store or product etc., the information trigger to deliver to the user mobile device by being in proximity to the RF beacon ID that installed in the local area.

[00280] By providing the ability to locate a the user in an area using a Bluetooth enabled device or a cellular phone with the navigation application, the system overcomes the anxiety of "Where am I" and also facilitates finding a parked car later via the RTP (Return to Parking) feature.

[00281] The system has the capability to perform all the functions of a search and can become the "Next generation search out of the box".

[00282] The navigation system can be an attractive addition to existing deployments of Wi-Fi and Wi-Fi hotspots and a feature for business and cities that deploy Wi-Fi.

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[00283] In case of an emergency or security situation, the system can provide authorities with information.

[00284] Utilizing the navigation system, the facilities (waypoints) in the vicinity around the "user" car are displayed on a floating overlay using either a cellular phone application, or a standalone device, or an existing installed navigation system with or without any mapping, the information can be pushed to the user's device when he in proximity to the area.

[00285] The recent introduction of imagery services, such as Google Earth and its competitors, that are offered as an enhancement to GPS at a fee, still provide out of date information, with the unsatisfactory result that users encounter road changes and area development not shown on the maps and imagery.

[00286] The option of downloading a floor plan can be exercised either remotely or locally as part of mapping or navigation application.

[00287] With the navigation system, the user will have the information that they want, when they want it, where you they it ...(and at an affordable price) Once you are in the vicinity of your destination and you switch on your navigation device, you will automatically receive the facility information along your waking route and in all directions around you.

[00288] Additionally, each facility type can be ID-coded apart of the beacon ID to identify the type of the store etc., e.g. restaurants, men's wear, women's wear etc. the store type, real estate property, garage sale location, special sale and all up to date real time information that can't be displayed and located in today's navigation system, and tapping to the local business industry is known as local advertising.

[00289] Each ID-coded as part of the beacon ID can be trigger accessed to obtain complete information about the store e.g., automatic waypoint information.

[00290] The system can be operate on a cellular phone, and navigation system and is not limited to a GPS navigation system.

[00291] Moreover, the navigation system can solve the "RTP" (Return to parking) problem, where many forget where they parked their car. The system has an option to save the location on

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the "cellular phone-parking detector" application, which will make it easy to locate the parked car.

[00292] The navigation system is designed for global use and is not limited to malls, stores, amusement parks, museums, sports stadiums etc. It can be implemented in parking garages or parking spaces metered or not, almost anywhere and in any place even in any infrastructure.

[00293] It is envisioned that in the future all new construction/infrastructure will have the beacons/tags included in the design or built in the structure..

[00294] One feature of the proposed invention integrates the navigation as part of the NAV4 concepts where it will provide complete solutions for local navigation in an area where the GPS and GPS mapping just can't provide accurate and updated information that is so essential to the user.

[00295] A typical application is navigating a pedestrian in an environment like a mall, department store, specialty store, conference, trade show, amusement park, university, hospital, school, municipal building, museum, subway, train station, airport, down town center, any type of parking facility ...or any place when and where GPS cannot be provided or is not accurate or precise enough. The system can be used for navigation by first responders to emergencies or disasters.

[00296] The navigation system is part of a broad suite of applications that include a complete solution to the "user" from the time that he parks, or begins looking for a space to park his car, walking to the store/mall to when he wants to return to his parked car, looking for the place that he parked.

[00297] The suite may include:

[00298] Parking detector-and navigation to the empty available parking space.

[00299] Nav4 mall/store navigation solution inside mall or store.

[00300] RTP-return to parking-locate the place that you parked your car.

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[00301] For example, a typical application could be:

[00302] A pedestrian asks the way in a mall to a specific store.

[00303] A pedestrian asks the way inside the store, to a specific aisle or product.

[00304] A shopper in a department store asks for a specific department.

[00305] A pedestrian asks the way to a Point Of Interest (POI).

[00306] In an emergency, the first response team has to navigate inside a smoke filled building.

[00307] A system and method to provide user information which is related to the Point Of Interest (POI)

[00308] The navigation system provides detection and navigation reference, position determination and information related to the object-Point Of Interest (POI) directly and automatically to the user interface-cellular phone without any communication help of Internet/web or cellular needed . . .

[00309] Special operation mode:-Shopping- NAV4SALE-provides navigation to the special sale item in a department store. A new unique tool for the business owner as well to the customers-to navigate and locate an item in a store/mall that's on a special sale, will provide the "user" a way to navigate in/out door for the "waypoint" represents the special sale, coupon, special event, promo etc ...an add-on to local advertising.

[00310] The local advertising market is estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of a local strategy. Due to the lack of availability of the GPS indoors as well with the limitation of its accuracy outdoors and the non-updated mapping that is provided today by the mapping and GPS industry, there is no real tapping to this huge market.

[00311] The navigation system can bring a new life to the navigation and mapping industry by providing a unique innovation that combines the GPS and the existing navigation as well as the cellular phone users with an indoor navigation based on the local map/mall that will provide the

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user a navigation to his desire location in the mall/store to the right store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. A new unique way to bring the customers to the product in sale . . ., direct the customer directly to the isle and to the product that you want to move. The store will also have an option to deliver more content (advertising, sale, coupons, promo etc ...) to the user when he approaches the store or is already inside via push technology to the user's Bluetooth enabled cellular phone.

[00312] Special operating mode:-Museums- NAY4Museums NAV SHOW and NAY CONFERENCE provides navigation and interactive information from the museum's show or conference exhibition to the "user's" cellular phone device via Bluetooth interface.

[00313] Explore museum or conference show exhibits in a new unique and easy way, find your way around when navigating on the floor map of the museum or conference, indoor navigation, navigate to exhibits, restaurants, cafes, lavatories etc., all to the "user's" navigation or cellular phone.

[00314] Any museum, conference, or show provides the attended a map to the exhibits, some also provide additional audio device (headset) to get more information on the exhibits.

[00315] The navigation system will provide a unique indoor tool that will allow the attended to navigate the museum, conference or show in an easy way directly to his Bluetooth enabled cellular phone, when he reaches his desired exhibit he will allow to download directly to his cellular or Bluetooth headset information about the exhibits. An indoor navigation to the exhibits as well to the restaurants, cafes, lavatories etc., all to the "user" navigation or cellular phone and based on the facility map.

[00316] Special operating Mode: Navtrain- For all the users of mass transportation system, the navigation system will allow, locate and point the "user" to the exact station or location on a route, an easy way to navigate in the train, subway, underground system, a new way of "sub-way" or bus mapping in/out door and directly to the user navigation or his cellular phone. Every day millions of people are using the mass transportation system, trains, subways, buses, each of the passengers depend on the transportation map for the route information as well as schedules

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and additional services provided by the transportation system. Most of the passengers today carry with them a cellular phone.

[00317] The navigation system will provide the passenger with the navigation inside the transportation system directly to the passenger's Bluetooth enabled phone, the passenger will know the exact location/station on the route as well with additional option information like schedules. A new add-on service to the transportation providers as well to the passengers, utilizes the indoor navigation method and the ability of the transportation entity to use the RF beacon installed in a transportation facilities to have add-on to transportation management control system .

[00318] Special operating mode:-Parking- NAY4PARKING describe in 2 patent applications, provides empty parking space detection and navigation. where is the RF beacons can be part of solving the parking problems where each parking location can be user an RF beacon with additional sensor to find if the parking area is empty and provide parking information – nav4parking. the RF beacon will broadcast ID only when the parking space is available, the user Bluetooth device will scan the area for the broadcast beacons to find the available parking, such method describe in more details in US Patent 7,899,583 issued to the Inventor and claimed as priority herewith.

[00319] A new generation of urban parking innovation that answers the most demanding need of any driver knowing where to park ..., or more precisely, find and navigate to the empty parking spaces in and around the driver. It will also provide the answer to "where did I park my car?" syndrome, when returning to the parked car. In our society where time, convenience and comfort are precious commodities parking is a major headache.

[00320] Parking Detection System is the next generation of urban parking and the answer to the most demanding need of any driver-Where to park?

[00321] The navigation system provides a method of self organizing parking system will enable municipalities and other parking authorities to easily identify, exploit and manage revenue opportunities while at the same time providing better service at a lower operating cost.

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With the implementation of the navigation system, navigating and detecting available parking spaces will become part of the information revolution.

[00322] With the navigation system, drivers will save time and reduce the frustration of hunting for parking spaces, and will also save money on gas use and car maintenance costs.

[00323] By using and modifying existing technology, our system will integrate easily with other transportation and communication systems. The RF beacon can be attached to existing parking meters, and in the future will interface with them and eventually will replace them.

[00324] Municipalities will have better control and centralized monitoring of their parking space inventory, resulting from the new generation of urban parking.

[00325] Special operating mode: NAYRealty - A new unique tool to accommodate the real estate industry by providing the seller/the real estate agent as well as the real-estate customer to locate and navigate to the available real estate property in the "user" area, according to his location and directly to his GPS navigator and/or cellular phone. The user may wish to see and locate the real estate property available in his area according to his location, where an RF beacon can be installed in each real estate property to trigger more information about the available property to the user/ possible client when he reach proximity to the property.

[00326] According to the Newspaper Association of America, the real estate advertising market is estimated at$11.5 Billion. Recently Mynewplace.com joined apartments.com and rent.com in the $3 Billion on-line apartment listing. **ZILLOW**, a new startup company just raised $32M in founding with the basic idea to put your house on Google Earth-satellite mapping. Google, Yahoo, AOL, ASK and Microsoft are looking to develop real estate products.

[00327] The navigation system brings the listing to the user's hand, by combining the GPS navigation and or cellular phone the user will be allowed to get the real estate property in his area updated according to his location in real time.

[00328] The user even will have the option to "search out of the box" of property in his area. The navigation system will serve as a new tool for the real estate industry as well to the search engine for the benefit of the seller/the real estate agent as well as the real-estate customer.

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[00329] Special operating mode:-NAV4STORE and NAVMALL provides navigation inside a store/department store to a specific department/aisle or specific product, with the option for advertising methods and special promotions. Explore the indoor mall or inside a department store, navigate to the right place or the store or the department that you need.

[00330] Navigate on the mall map/store mapping to find your way around using your cellular phone or navigation system without a GPS. It will be a new kind of service and a new marketing strategy for the malls/store business owners. An add-on to local advertising.

[00331] The local advertising market is estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of local strategy. Due to the lack of availability of the GPS indoors as well as the limitation of its accuracy outdoors and the non-updated mapping that is provided today by the mapping and GPS industry there is no real tapping to this huge market.

[00332] The navigation system can bring a new life to the Navigation and mapping industry by providing a unique innovation that combines the GPS and the existing navigation as well as the cellular phone users with an indoor navigation based on the local map/mall that will provide the user a navigation to his desired location in the mall/store to the right store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. The store will also have an option to deliver more content (advertising, sale, coupons, promo etc.) to the user when he approach the store or is already inside via push or Internet to the user's Bluetooth enabled cellular phone.

[00333] Special operating mode:-NAV Amusement Parks-Theme and amusements Park navigation, navigate to your desired attraction as well as a new way to register a "fast pass" kind off lane ...all in an easy way to the "user" cellular phone without the need for GPS. Provides a new media and-on service.

[00334] Ever wonder what it will be like to navigate inside the amusements park to the desired attraction, to know the schedules of the show events at the attractions and even to get your "fast pass" from a remote instead of standing in line ...With the navigation system, all this can become a reality and go directly to your cellular phone without the need for a GPS. It is

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understood that the present invention can provide a new tool and service to the benefit of the amusements parks as well to the user.

[00335] Special operating mode:-NAVSIGN-will pro- vide the user with automatic generating waypoint of the road sign to be displayed on the user navigation and or cellular phone or the car navigation or on the dash board as a way for secure driving, the information can interface to the car computer for example automatically slowing down when it enters a school zone-NAVSIGN.

[00336] Special operating mode:-NAV EMERGENCY: One of the important features of our indoor navigation techniques will enhance the ability of the first response team to navigate within the buildings in which it has been deployed.

[00337] The navigation system provides a method that is a low-cost, reliable solution for firefighters and other first responders, inside buildings, to navigate where a GPS is not reliable-indeed, the GPS signal may have been disabled temporarily to prevent exploitation by terrorists, or even more likely no signal can be received at all inside a building.

[00338] The navigation system envisioned this limitation of GPS based systems, and is intended for an environment that is potentially much less "friendly", the environment inside a building that first responders encounter may contain smoke, dust, or flames, and is intended to leverage advances in ubiquitous RF/Bluetooth tag technology.

[00339] The navigation system will exploit the capability of storing critical building information, such as the floor maps and the emergency escape plans, for retrieval and navigational assistance via a Bluetooth enabled cellular phone, when and where it is needed. Moreover the navigation system can serve as a navigator for the emergency exit route when and where it is needed. Each user can download the emergency exit floor plan and escape with the knowledge of his exact location in that route.

[00340] Aspects of the scenarios to be included:

[00341] Identifies and tracks the user (a first response team member).

[00342] Provides the user with navigation information and directions for safely exiting the building.

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[00343] Provides location information of all team members, via an ad hoc network of radio terminals that combine RF/Bluetooth and allow communication chat and messaging between the team members without need for Internet or cell communication such option is not limit to the first response team but to a user in emergency and non-emergency use.

[00344] From the outset, the navigation system was been designed with the capability to utilize existing technology so it can be deployed as a stand-alone system, or in tandem with existing systems.

[00345] With the implementation of the navigation system, a FIRST RESPONSE TEAM will be empowered to navigate and find its way in a case of emergency or a disaster. This capability can be a critical life saving power in modem congested urban living conditions that was not available before now.

[00346] It is believed that implementation of the navigation system will assist counter-terrorism activities and more importantly will help the first response teams to save the lives of people trapped inside buildings.

[00347] Waypoint Navigation

[00348] A waypoint is a fixed location with known address location, longitude and latitude and coordinates. The navigation system is capable of storing a database of waypoints for the following purpose:

[00349] Waypoints mark a destination, a point along the way to a destination, or a point of reference. Normally, navigating, a "route" consists of one or more waypoints. To traverse a route, the user navigates to the nearest waypoint, then to the next one in turn until the destination is reached. The system has the ability to compute a great-circle route towards a waypoint, enabling them to find the shortest route even over long distances. The system enables users to locate a destination on a map and define it as a waypoint. The system is intended for navigation; it can generate a suggested route between two waypoints, based on the cartographic database. The system indicates the user's current location and gives advance notice of an upcoming point.

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[00350] Because the system knows the waypoint positions, and the distance between them it, it is easy to determine the "user's" exact location.

[00351] Map Matching

[00352] The navigation solution is further enhanced, although it is not essential, when the system knows that the person or object being located is traveling along known routes on a map; for example, the system can assume that people can only follow certain routes in a mall. This is priori information that can be used to "force" the estimated position to be on the nearest point on the possible routes. The constraints of indoor construction similarly can be used to refine estimates of the position of a person or object moving within a building-people and objects do not pass through walls, they pass along corridors and through doorways. It is the best solution for a system in case of an emergency or for a system for homeland security or a system to locate and inform the subway location, a good example is the hotel exit floor map.

[00353] In all, the unique method can be summarized as follows:

[00354] Direct communication between the area (way- points) and the user (navigation/GPS)

[00355] Automatic waypoint generation in real-time according to the user area

[00356] Indoor/outdoor even without GPS

[00357] Business model when the business/store owner will be subscribe to the listing in the navigation/GPS mapping

[00358] Provide overlay floating model to be work even without mapping

[00359] No Internet or cellular communication is needed to detect and determine a user's location for additional location based services (LBS) information and push and or data Internet service needed.

[00360] Can interface to the existing system and link to existing software and hardware system.

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[00361] The option of search is done locally on the user device, no central database or Internet search needed.

[00362] Bluetooth interface to cellular phone, will run as application on the Bluetooth enabled device, such as a cellular phone.

[00363] Provides indoor navigation and indoor facility map and or floor images- guide and navigation.

[00364] All global positioning system (GPS) navigation systems lack of real-time displays of the waypoints around the driver/user route, most likely, the information of GPS maps may be old and therefore inaccurate.

[00365] The navigation system provides a system and method for generating and updating in real time a navigation's waypoints automatically along the route according to the user associated with local detection of RF beacons installed in the area and will for the first time trigger an a delivery of real time waypoint information along the user route directly to the user's navigation and/or his cellular phone.

[00366] The navigation system will enable a circular omni-directional display on the map or floor images floating overlay on existing navigation map or floor mapping or indoor floor images .

[00367] The waypoint data trigger generates directly from the way- points beacons ID, no Internet or cellular communication is needed to determine the location.

[00368] The navigation system will bridge the existing navigation system and GPS mapping to new real time information according to the user's location.

[00369] The navigation system will allow for the first time the navigation and GPS industry to tap to the local advertising market estimated to be $134 Billion in the US alone . . ., the mapping is at the "forefront" of local strategy. Due to the lack of availability of the GPS indoors as well as the limitation of its accuracy outdoors and the non-updated mapping that is provided today by the mapping and GPS industry there is no real tapping to this huge market.

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[00370] It is believed that the navigation system can bring a new life to the Navigation and mapping industry as well to the cellular providers by providing a unique innovation that combine the GPS and the existing navigation to the real time information directly from the waypoints, which can be referred to as a COOLSPOT.

[00371] This invention is directed generally to the field of navigation and, more particularly, to such a method to be used indoors or outdoors in a mall, store, buildings, department stores, and to provide local based services directly to the user's navigation or cellular phone.

[00372] The proposed applications have identified and resolved a great deficiency in the technology available for local businesses. LBS represent a huge advertising and mapping market-estimated at over $150 billion a year. It represents a big opportunity in the navigation market that has not been explored yet

[00373] Existing System and Industry Trends:

[00374] Local mapping today is mostly paper: Mall maps, store maps, mapping of department stores, commercial buildings, hospitals, schools, campuses, municipalities, shopping centers, downtown districts, indoor facilities, building maps, parking areas, parking garages, amusements parks, subway systems, transit maps, museum maps, area attractions maps, hotel and resort maps and even more importantly the emergency maps and procedures posted in buildings.

[00375] Factors in Local Mapping

[00376] Local maps can be of either indoor or outdoor locations.

[00377] Local maps are available on paper, on the web, and in some cases on a kiosk in the facility.

[00378] A high degree of accuracy is needed in order to provide usable maps for navigation indoors-less than 10 m-to a store or even a parking space.

[00379] GPS cannot provide acceptably accurate mapping as it is only accurate to within 100-200 feet. This is the reason that the GPS industry does not provide this type of mapping. The same is true for cellular network providers, as the accuracy is also 100-300 feet, and then only

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when the signal is available. Signal availability is often a problem indoors and also when it is most needed-in an emergency situation when most of the cellular network fails due to high demand. Again, this is the reason that there is no local mapping available for cellular users. (Local mapping equates to accuracy in finding a store, room, or parking level within 5 m.)

[00380] At this time there is no indoor navigation solution. The most recent technology provides access to a user's location through a combination of group "social networking" and a "buddy list".

[00381] Most technology available today attempts to "locate" a moving "user" in an area, the present invention reverses that idea and lets the "user" navigate the local area on the local maps, indoor navigation compared to outdoor navigation, pedestrian navigation is more than locating and navigating, most likely they are at or near their destination already. There are two possibilities, either they are in unknown surroundings and their task will be to explore the surrounding or they are looking for a specific product-their defined goal is like buying a new pair of shoes or getting a book or just going to shop around, exploring a new location, new deals, specials sales, or simply sightseeing.

[00382] The theory is based on the belief that "you are what you do" meaning, the services, specials, sales, coupons, discounts, and the like are one key element.

[00383] The main task of indoor navigation is to show the user where the specials, sales, and coupons are and direct-navigate the user to them and at the same time provides the business owner with a marketing tool that as of now is not exiting . The integration of multimodal journey planning and guidance to dynamic waypoints, sales, specials etc.... and complex public interchange facilities are not adequately addressed by existing systems.

[00384] In some aspects, indoor navigation looks simpler than outdoor navigation. For instance, the geographical area covered is much smaller and the expected speed of travel-walking-is much lower. However, other aspects make indoor navigation much more challenging. First among these is the unsuitability of GPS and related technologies. Second is that in a complex indoor environment the requirements are more stringent. For example, vertical

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positioning of the topology and the need for accuracy less than 10m-to the store, the product, and even to the aisle or the parking space-cannot be achieved with today's existing system.

[00385] The indoor market represents much greater potential than outdoor navigation, as on average people spend more than 90% of the time indoors ....

[00386] The Objectives and Goals Behind This Concept: The technology behind the navigation system is quite simple-a direct communication between the user's device/cellular phone, Bluetooth enabled device, and a Bluetooth tags/sensors/beacons installed in a known location in an area/ building/store/facility without relying on GPS, centralized servers, Internet bandwidth or even cellular communication-they can be supportive but are not essential.

[00387] The main concept is to use existing off-the-shelf technology (Bluetooth) with small modification and devices with a minimal cost of deployment and to provide a simple indoor/pedestrian technology which can delivers accuracy with an integrated suite of applications especially designed for the user/shopper indoors, the system is based upon RF beacons Bluetooth or Wi-Fi installed in the local area to be scan by the user device – cellular phone and use the proximity scan beacon ID and signal strength to provides an instant detection a notification of existence to the business owner and trigger delivery of update local based information all without even exchanging a real communication (no paring etc.. needed) with the proximity beacons.

[00388] The System Includes:

[00389] Local mapping or local floor images – the indoor view of the facility as part of the application, the facility can offer a download or participating from a proximity information sign or the store/mall/building information to trigger download the application or ability to pre load the maps as part of navigation or mapping application before reaching the area or download from the web according to location determine by the RF beacons.

[00390] Ability to have special navigation software either as an add-on to existing navigation on the user's cellular phone or existing navigation system (car, mobile) using the Bluetooth beacons to determine the exact location and trigger applications.

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[00391] Ability to deploy Bluetooth beacons in the local area where the beacon will broadcast ID to be known the location-waypoints and trigger additional information and or local based applications and to provide the infrastructure needed to guide navigate in the area. A very low cost and fast deployment beacon system.

[00392] The ability to use the log of the "user" Bluetooth ID or the Bluetooth ID as a key (NOT THE CELLULAR NUMBER) for future marketing purposes or for emergency use. This aggregation of data with association to proximity Bluetooth beacons ID will be in valuable to retailers, business etc. Bluetooth enabled cellular phones can be used as beacons.

[00393] The beacons-parts of the navigation system are Bluetooth tags/beacons installed in known locations in the area/facility and represent "waypoints" where is the beacon ID can represent the facility type, store/ special sales, places etc. and the location in the facility location....

[00394] The scanner detection part of the application -whenever a mobile phone or mobile device with a Bluetooth switched the Bluetooth on and loaded with the application, it will periodically scan the area for Bluetooth beacons; proximity to a tag/beacon and the tags/beacons ID as well with signal strength will determine the "user" location on the area/ facility map and will trigger an automatic notification automatic check-in to the business owner to trigger application with possible a link to existing system to provide the user and the business owner additional information just by being there an use the method above.

[00395] The navigation-can be plotted between way- points/store/places on the map.

[00396] In regards to the sale sense-marketing tools, the system works by passively observing the initial part of the scanning of movement. The proposed system does not monitor or listen to conversations or text messages. Nor does the proposed applications transmit or intercept any information or interfere with the mobile network operators in any way. The navigation system is a scanning detector (not a receiver or transmitter) which can observe the unique Bluetooth ID/key set of the device (not a telephone number or name ...) with association to the beacons ID which the device was near and aggregate resultant data to be server for habit and/or preference for triggering content delivery.

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[00397] Sales sense represents a method to use dynamic user input profiling with proximity beacon ID installed in the known location indoors and outdoors for empowered presence and trigger content delivery for a real life interaction and all under the user's complete control and without compromising his privacy. The paradigm of proximity-based discovery and communication enabled by Bluetooth technology can be very relevant in Ambient Intelligence as an enabler for a situated interaction.

[00398] The navigation system explores the use of predefine user input (user profile or preference) as a key driver for situated interaction and trigger content delivery according to the user profile/preference. The approach is to use of RF Bluetooth beacons installed in a known location in a local area to trigger action witch associates the user cellular phone ID and or profile / preferences beyond self-exposure and introduces a method that can trigger actions.

[00399] The approach to the use of Bluetooth ID of the beacon beyond self-exposure and introduces as a technique in which the system can recognize the Bluetooth ID as explicit instructions to trigger actions/process.

[00400] Firstly, because it has an extremely Low entry barrier, Bluetooth is a widely available technology. Most of all phones include the Bluetooth, and setting new Bluetooth device ID is normally a relatively simple task that can be accomplished with the base functionality of any mobile phone. This easy availability is of huge importance in enabling social practices around the technology and represents a major difference to other sensing and interaction approaches that, albeit more sophisticated, may require specific hardware or software in personal devices. Secondly, the use of Bluetooth presence for situated interaction combines very well implicit and explicit forms of interaction, in fact blurring the distinction between them. Simply by scanning the proximity Bluetooth device, people are already part of the situation and implicitly engaging with the system.

[00401] This continuous, flow of presence information can be fundamental in the aggregation of situated content and may act as an important catalyst for more explicit forms of interaction. This is what mainly differentiates interactions based on Bluetooth presence from other interactions.

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[00402] The chosen methodology combines a user define profile encode into the Bluetooth device by setting up a user like VIN number, with user privacy as a priority, the profile is encoded into the user Bluetooth device with an algorithm sequence protecting the user's privacy.

[00403] It provides important practical implementation of the Technique and on its usability within the complex set of social phenomena that characterize situated interaction in a public places without compromising the user privacy. Its effectiveness and simplicity can make it easily adoptable for applications like local social networking interactions, near field communication like secure transactions, payment methods, secure recognized methods and trigger secure processes and delivery of direct content according to the user profile or preference, all again without compromised user privacy and provides the user with complete control all the time. The method can be integrated and provide privacy and secure transaction to empower application that may otherwise exploit user ID, his profile and privacy as such the method can provides a secure payments transactions.

[00404] Every day millions of people access the Internet and enter their profile, personal information, or answer questions about their preferences in order to access a service / site, to get incentives, coupons, specials, etc... The sites use the information for marketing and in some cases share or sell the information. Recent research has found that most people are willing to give information for incentives.

[00405] Using the profile and records, the surfing habits of the user (IP) is the way that all the search engine companies make money on the Internet. At the same time they try to direct the content to the user according to their profile/habits.

[00406] But what about real life? People spend more and more time indoors (according to recent research, people spend more than 90% of their time indoors).

[00407] A scenario of searching for stores, items, special sales, and coupons according to our desire is repeated again and again... The question is how can the system transfer the success of the Internet marketing tool and the easy search for real life?

[00408] That is the main idea behind the navigation system – what if a system can take a profile / user statistics or even user input with them anywhere and provide one or more

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intelligence marketing tools. Moreover, the user is in complete control over their privacy, they can just shut the application off.

[00409] In the disclosed navigation system, the user has their profile sales preference and they are encoded into the user's cellular phone to be associated with the proximity beacon ID installed in the local area . (There is 3 ways: A. set segment - the segment keys are not unique and help to setup the user segment only. In that case the key is not unique. B. To generate a unique key – to be used like the Internet IP. C. Create a dynamic key and multiplies profile according to location/user preferences.

[00410] The profile can include: Gender, age, and sales preference (interest), and does not include any personal profile. It may be the same as seeing the user and recognizing their gender, age, and other preferences just by looking at the user. The user is not revealing any kind of information that most sites ask for in a registration process and no personal information like name, address, or telephone number is exposed.

[00411] As part of the suite of LBS application, the user's phone will scan the area for the tags/beacons. For example – by being proximity close to the directory stand in a mall a decoding of the user key will be processed in order to allow the user preference segments and trigger delivery to the user with ads, specials, and incentives according to their profile as well as providing again the business owner with the best marketing tool- knowing his customers they profile and habit all using a very low cost RF Bluetooth beacons installed in the area and associate them with the user Bluetooth device-the cellular phone.

[00412] "Your customer is telling you what they want, are you listening?"

[00413] The main idea behind this is to provide the user with pin-point content according to their desired preference at the location trigger by the proximity beacons ID and also direct /navigate them to the desired location where they can find the store/sales/special/coupons or the information that they are looking for able to get meaningful data around shopper habits and store layouts statistics, as well as to help them partner up to offer better loyalty incentives to their customers through programs that extend beyond single storefronts, its sensing second-by-second a shoppers interest about specific product, place and can provides the business owner with a

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complete marketing tools not available until now and at the same time provides the user with offers directly from the business according to his habit preference profile.

[00414] The sales sense, user preference module is an add-on to the sales sense marketing where it joins the user behaviors module to create a very unique LBS business and marketing model. Imagine a potential customer standing in a crowded store aisle, feeling overwhelmed by all the choices. What if you could just reach out and give him or her something to help with the decision – a coupon, product information, discounts — right at that moment? Content marketers will soon have the ability to do this and a whole lot more just by implementing our method.

[00415] Sales sense-Shopping Behavior: How consumers decide what to buy and when is going to drastically change. Winning marketing need to provides and will require getting exactly the right content in the right place at the right time with even more precision. Shoppers will have the ability to collect real-time information, comparison pricing, discounts and other helpful, highly tailored data as they walk through a store or browse near particular items. It will be imperative to produce well-timed, compelling content that is useful in those crucial moments before a choice is made. Sales sense – next generation marketing tools, from coupons and giveaways in stores to tours of museums to airports that provide real-time flight information, the possibilities are endless.

[00416] Consumers will start engaging with content in a whole host of new ways. Rather than just providing information suitable for a web browser or even a mobile user, marketers will need to think about ways to provide content that will be of value to users as they live their lives. From businesses to city parks to, the system provides a user tools to access helpful, real-time data like never before. As recently published research showed that on average people spend 90% of our time indoors. The proposed invention allows an effective integration of on-line and off-line shopping.

[00417] Moreover, according to research, indoor navigation may be more important than outdoor navigation and may represent a huge new market.

[00418] Our technology allows shopping centers, malls, department stores, buildings, airports, train stations, exhibition centers, museums, and amusement parks to understand the way that

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their customers or passengers flow through their premises. At the same time it provides the user/shopper with unique indoor navigation capability without compromising user privacy.

[00419] Our innovation will allow, for the first time, the navigation and GPS industry to tap into the local advertising market, estimated to be $134 Billion in the US alone.

[00420] Our technology provides a reliable method for identifying the path habits and the behavior that people take through an area. There are a number of advantages to our technology including:

- Extremely large sample size as mobile penetration is above 90%,
- Shoppers remain anonymous,
- Accurate to within 2m, and
- Based on a Bluetooth technology.

[00421] For retail areas, malls in particular, the advantages of understanding shopper behavior are significant. Such information can assist the mall to:

- Evaluate and improve their retail tenancy mix by identifying which stores shoppers consider complementary,
- Identify underutilized areas in the mall,
- Understand the impact of anchor stores on the mall,
- Measure the implications of particular promotions or center events,
- Assist with planning day-to-day mall operations,
- Provide add-ons for the shoppers,
- Provide shoppers with a “web” like shopping experience,
- Provide shoppers with incentives /advertising,

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- Increase security ,
- And in an emergency provide the shoppers with alarm and notification, and
- Allow shopper engagement with the store, the RF beacons can become the small neighborhood store by recognize the shopper, what is missing from the on-shopping.

[00422] Our technology is the only system on the market today that can gather information on shopper paths continuously and accurately based on locally installed RF beacons without any need to establish any communication relationship between the user cellular phone and the beacon (no paring or any communication needed to determine the location) and all without compromising the shopper ID or their privacy.

[00423] The various methods disclosed can also provide a way of surveying the behavior and preferences of the "user" shopper simply by observing the signals (encoding Bluetooth naming key) given off by their mobile phones and associate it with the proximity beacon ID which they are near and at the same time provide the shopper with a unique special application for indoor navigation triggering a local based services applications.

[00424] The present invention provides a next generation approach to the location based services (LBS) market, especially to indoor applications and to areas where a GPS cannot provide accurate navigation.

[00425] The data collect using the disclosed technology can be used to provide trend reports showing which shops are most visited and at what times, whether there are sufficient public facilities to serve the visiting shoppers or whether more security staff are needed to name only a few of the potential benefits. Ultimately, the collected data can provide assistance to shopping centers to become more in-tune with their customers so that they can create better, more pleasant places to visit.

[00426] The proposed analytics can turn shopping center/department store/store into finely tuned sites, enabling mall/store owners to direct the flow of traffic efficiently around the information coming from the user to the benefit of the user and the business owner to provide services such as VIP personalize services, and the like.

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[00427] In contrast to alternative techniques, there is no device that tracks the user cellular phone. In the disclosed methods the user device/ cellular phone is the one that scans and tracks tags/beacons along the route, each scan includes the beacons ID and the user device mobile phone ID, and while these keys help track the movement of the signal and its owner, they don't reveal the identity of the user. This is a more precise method than what Google maps uses to detect a general location on a mobile phone by cell towers which are accurate between 300-1000m compared to our accuracy which is below 10m.its allow the business owner to be notify about the user existence in his vicinity and allow sending the user offers/deals more information and at the same time collect very important information to the business owner such as habits, profile, preference of the user to provide precise contents directly to the user cellular phone.

[00428] Example of Scenarios:

[00429] A user in a mall can use a local guide and navigation application suggest to him to download at the mall/building/facility or have the application already as a cellular phone mapping application.

[00430] As part of the application the Bluetooth on the user's mobile phone will scan signals from known locations-Bluetooth beacons and will determine the "user's" location on the local mall map (the same way as a GPS) with accuracy of less than 5m. (More beacons with LESS signal range=more accuracy)

[00431] For example, the Bluetooth beacon can broadcast an RF signal that includes its position coordinates (e.g., latitude, longitude), which can be detected by a mobile device. The position coordinates can provide a third location accuracy for the current location of the mobile device by virtue of the mobile device adopting the position coordinates of the beacon as its own position coordinates.

[00432] The known locations of a number of beacons in a geographic region (hereafter a "beacon infrastructure") can define a geofence that encompasses the geographic region.

[00433] In some implementations, the beacon can also advertise location based services provided by the beacon infrastructure. Upon determining that the mobile device crossed the geofence defined by the beacon infrastructure. The application can monitor for beacon signals

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and continuously update its location to be the location of the beacon currently in proximity with the mobile device.

[00434] When the mobile device loses contact with the beacon for a defined period of time (e.g., 5,10 minutes) or when the mobile device exits the geofence defined by the beacon infrastructure, the application can transfer the monitoring back to the application subsystem, so that the location of the mobile device can be determined using Wi-Fi and or Cellular ID.

[00435] In some implementations, the application can distinguish between beacons in the beacon infrastructure and mobile beacons that may be detected in a scan, such as other Bluetooth enabled mobile phones operating within the beacon infrastructure.

[00436] For example, each beacon in the beacon infrastructure can provide data in its broadcast signal that indicates that the beacon is part of a beacon infrastructure.

[00437] Alternatively, or in addition, when a mobile device makes first contact with a beacon in the beacon infrastructure, that beacon can transmit to the mobile device a list of unique identifiers (e.g. beacons ID) of other beacons in the beacon close infrastructure and other information about the beacon infrastructure, such as a name, geofence data, one or more websites associated with the beacon infrastructure.

[00438] Beacon infrastructure can be located in any geographic region, including businesses (e.g., shopping malls, retail stores, restaurants), landmarks (e.g., museums, airports, parks, entertainment venues) and any other environments where location based services are desired.

[00439] The available local advertising marketing is huge with over $150 billion in revenue in the US alone.

[00440] Indoor LBS Applications

[00441] This is a concept that offers a complete suite of application from finding parking to navigation of indoor malls\stores and with a capacity to navigate to emergency exits with a low cost to implement and with a business model that can be used to attract customers.

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[00442] The application represents a big opportunity in the navigation market and will open up new avenues for companies from telephone operators to mall/store/department storeowners to navigation and mapping companies.

[00443] The disclosed technology presents a low cost and easily deployed infrastructure for local based navigation outdoors and indoors without the need for GPS and or cellular networks. Moreover, the concept is especially suitable for local area (indoor and outdoor) services when and where the GPS and the cellular network can't provide the solution and the accuracy needed to provide such navigation (1OM or less).

[00444] The disclosed technology provides a system is based on existing Bluetooth, a technology that is proven to be stable, simple, inexpensive and mature in market use. Moreover, it is a common communication tool and is available on more than 85% of all new mobile phones.

[00445] System Architecture:

[00446] The infrastructure consists of RF Bluetooth beacons installed in known locations in a local area. The beacons will respond to Bluetooth device scanning inquiries made by "user's" Bluetooth enabled cellular phone or other Bluetooth device with a the special application.

[00447] Each of the RF beacon are ID that represent the Location ID as well as represent the facility/product type. A mobile device as well as any Bluetooth device (desktop, laptop, tablet and cars etc.) can become also a beacon providing a new echo system where an infrastructure can include static and dynamic deployments of beacons interact with each other's.

[00448] The local area map (mall map, store, building map, area map etc....) will be available to be downloaded as part of a mapping system that can be triggered to download at the entrance of the building/mall/area or the directory to provide the mapping for the navigation or as part of a mapping and navigation application.

[00449] A "user's" Bluetooth cellular phone will scan the local area for the location beacons. When a "user" is within 5/10 meters, the location beacons respond, providing room- level navigation accuracy. The beacon ID as well with signal strength will provides instant localization determination, with multiple beacons installed and possibly receiving more than one beacon's

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signal, a simple triangulation calculation and options for signal strength will determine the exact location of the "user" on the downloaded map of the local area. Note that there is no communication establish between the beacons and the mobile phone (no pairing), and that no connections to the Internet are necessary (even so to be provide with more information you may need Internet).

[00450] Other signals not on the list will be ignored, There is a mixed use of beacons and delivery option depending on the application (for example in a mall application, the stores can have a WAP or use the Internet to automatically deliver more content push to a "user's" mobile device where the beacons serve as navigation "antennae" as well as trigger mechanism to provides application exploit and waypoints contents to help the "user" navigate in the area. Application can be: Sales Sense-Next Generation Marketing Tools: the Behavioral Module, Nav4Parking,Nav4Realty, Nav4Mall, Nav4Sale, Nav4Museurn, Nav4Show, Nav4Train, Nav4Sign, Nav4Emergency, Return2Parking, Nav4Store, Nav4Conference, Nav4Disney, Nav4Events,

[00451] Moreover, according to research, indoor navigation may be more important than outdoor navigation and may represent a huge new market.

[00452] The technology disclosed herein enables shopping centers, malls, department stores, buildings, airports, train stations, exhibition centers, museums, and amusement parks to understand the way that their customers or passengers flow through their premises. At the same time it provides the user/shopper with unique indoor navigation capability without compromising user privacy.

[00453] The innovation disclosed herein enables, for the first time, the navigation and GPS industry to tap into the local advertising market, estimated to be $150 Billion in the US alone.

[00454] The technology disclosed herein provides a reliable method for identifying the path habits and the behavior that people take through an area.

[00455] There are a number of advantages to the technology disclosed herein, including:

Extremely large sample size as mobile penetration is above 90%

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Shoppers remain anonymous accurate to within 5 m

Based on a Bluetooth technology

[00456] For retail areas, malls in particular, the advantages of understanding shopper behavior are significant. Such information can assist the mall to:

[00457] Evaluate and improve their retail tenancy mix by identifying which stores shoppers consider complementary. The device/cellular phone is the one that scans and tracks tags/beacons along the route, each scan includes the cell's unique Bluetooth ID, and while these ID'S help track the movement of the signal and its owner, they don't reveal the identity of the user. This is a more precise method than what Google maps uses to detect a general location on a mobile phone by cell towers which are accurate between 300-1000 meters compared to accuracy of the disclosed technology which is below 10 meters.

[00458] Some reports about shoppers show how valuable behavioral information actually is and the profit opportunities that come along with this:

[00459] Where they go, Where they go next, Where they do what, When they do what, who does what?

[00460] Understand behavioral patterns across demographics. Similarities, differences and much more.

[00461] Sales Sense User Preference Module

[00462] Every day millions of people access the Internet and enter their profile, personal information, or answer questions about their preferences in order to access a service/site, to get to a mall, identify underutilized areas in the mall, understand the impact of anchor stores on the incentives, coupons, specials, etc.... The sites use the information for marketing and in some cases, share or sell the information. Recent research has found that most people:

[00463] Measure the implications of particular promotions or center events

[00464] Assist with planning day-to-day mall operations

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[00465] Provide add-ons for the shoppers

[00466] Provide shoppers with a "web" like shopping experience

[00467] Provide shoppers with incentive/advertising and automatic check-in method

[00468] Increase security

[00469] And in an emergency provide the shoppers with alarm and notification

[00470] The disclosed technology is the only system known today that can gather information on shopper paths continuously and accurately using a RF Bluetooth or Wi-Fi beacon technology and all without compromising the shopper ID or his privacy.

[00471] The disclosed unique and innovative system and method which can also provide a way of surveying the behavior and preferences of the "user" shopper simply by observing the signals (Bluetooth beacon ID) associate with their mobile phones and at the same time provide the shopper with a unique special application for indoor navigation and local based service for the benefit of the shopper and the business owner.

[00472] The data collected using the technology can be used to provide trend reports showing which shops are most visited and at what times, whether there are sufficient public facilities to serve the visiting shoppers or whether more security staff are needed to name only a few of the potential benefits. Ultimately, the data made available by the disclosed invention helps shopping centers to become more in-tune with their customers so that they can create better, more pleasant places to visit by providing a loyalty and reward program.

[00473] Analytics provided by the disclosed applications can turn shopping center/department store/store into finely tuned sites, enabling mall/store owners to direct the flow of traffic efficiently around.

[00474] In contrast to alternative techniques, there is no device that tracks the user's cellular phone. In the disclosed method the user is willing to give information for incentives.

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[00475] Using the profile and records, the surfing habits of the user (IP) is the way that all the search engine companies make money on the Internet. At the same time they try to direct the content to the user according to their profile/habits. But what about real life? People spend more and more time indoors (according to recent research, people spend more than 90% of their time indoors).

[00476] As part of the blue umbrella suite of location based services (LBS) application, the user's cellular phone will scan the area for the tags/beacons. For example-by being proximity close to the directory stand in a mall a decoding of the user key will be processed in order to allow the user ID and/or preference profile and provide the user with ads, specials, and incentives according to their profile "Your customer is telling you what they want, are you listening?"

[00477] The main idea behind this is to provide the user with pin-point content according to their desired preference at the location and also direct/navigate them to the desired location where they can find the store/sales/special/coupons or the information that they are looking for. At the same time there is also a benefit to the mall/store owner by getting the next generation's sales tools, getting costumers' habits and their sales profile, and able to serve better and accordingly the costumers.

[00478] The sales sense, user preference module is an add- on to the sales sense marketing where it joins the user behaviors module to create a very unique LBS business and marketing model the analysis of these spatiotemporal data can supply high level human behavior information valuable to urban planners, local businesses, and the Local Based Services (LBS) marketing.

[00479] Mall/department store/store indoor applications are part of nav4mall/store

[00480] The indoor applications and navigation takes a further step to give the user/shopper next generation shopping tools by providing them with the following indoor applications that are part of nav4mall/store.

[00481] Map and indoor Navigation-brings the local mall/ store map to the digital age, allowing the user to navigate from waypoints to waypoints on the map Directory- It brings the

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store/mall directory to the cellular phone. Search and Find-store/place/item products that are on the directory represent waypoints/tags/beacons on the loading maps.

[00482] Sales/specials-discounts, sales, and coupons, that can be added-on or a replacement for the mall/store flyer that provides the shoppers at points in the mall/store, it can even direct the user/ shopper to the aisle with the products and to coupons and directs the shoppers to what they looking for.

[00483] Parking and return2parking- although not directly the same beacons (for the parking the infrastructure employs long range beacons where in a store/mall the beacons can be a shorter range). The disclosed service allows the user to find parking spaces and location of parked cars.

[00484] Info-the information part can provide information about events, restrooms, ATM locations, seating area, kids playground, fountain, public phones etc....

[00485] Emergency-A very important part of the disclosed innovation is the ability to provide the user with a unique alarm and notification to the user without depending on other communication links like cellular phones that are prone to failure in emergencies. The present invention provides the user with the building/mall/store/place emergency procedure and in emergency will help navigate the user to safety.

[00486] Panic-part of nav4emergency allows the user to request being located in an emergency.

[00487] Privacy: The system does not collect personal information such as name or phone number. It does, however, record the phone's Bluetooth identification number to build a profile of the user or the use of the phone in the area. It is like surfing the web where a "user's" IP address is recorded for future marketing statistics and surfing habits (with permission from the user). Also as part of the encoding key into the Bluetooth device (user profile) as described in the sale sense part the privacy and security increases to the level where viewing the key broadcast by the Bluetooth device can't reveal any user identity unless the user requests to be registered to get incentive, specials, sales, etc., even then his name or other personal information is secure and only the Bluetooth device key/ ID are recorded.

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[00488] By directly targeting the consumer standing right outside or inside a business, an event, or walking toward a kiosk or restaurant, merchants can maximize their marketing budget while incorporating a new, inexpensive and effective form of advertising.

[00489] The "user" is in complete control. They can disable their Bluetooth application any time or just reject content, there is no "spam" effect and the "user" is attracted by incentives rather than generic promotions. In a mall-like environment a "user's" incentive to use the disclosed technology can be further enhanced with the use of the associated key advantages and packages.

[00490] Isn't this all a bit like "big brother"? Not at all, and it isn't even "little brother"! The system simply logs the movement of a cellular phone around an area and aggregates this to provide trend data for businesses. It's much less intrusive or invasive than existing methods that are already in widespread use-for instance CCTV cameras and number plate monitoring as they do collect personal information such as your image or car number plate. The disclosed technology represents the next generation shopping experience in shopping centers, malls or stores and fits very well with today's business model. Such a service can be offered for free to the "users" and backed by advertising and the use of the data by the stores. Such service and application and the ability to include the full "suite" of applications especially designed for shopping malls/stores and including the emergency part of it will also ease the fear of "locating" or any other privacy issue.

[00491] Who benefits from the disclosed technology? Everyone benefits from the trend data collected. The process enables a way to collect instant feedback from shoppers without having to bother them for information. In the old days centers would have used researchers to survey consumers but this information takes time to collate and response rates are very low these days as shoppers have increasingly become reluctant to stop and share their feedback. Hence the disclosed innovation provides a very effective method in the same way that TV networks know how many people watched particular programs and use that information to discern what programs to make and how to calculate the costs advertisers must pay to promote their products during different timeslots, the system provides the equivalent for shopping center owners and their resident retailers. It is believed that introducing the proposed system and marketing tools

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above can help users and merchants upgrade the real shopping experience of today with the advantage of the web like tools.

[00492] The disclosed innovation represents the next generation shopping experience in shopping centers and malls and fits very well within today's business model. Such a service can be offered for free to the "users" and backed by advertising and the use of the data by the stores. Such service and application and the ability to include, the emergency part of it will also ease the fear of "locating" or any privacy issue.

[00493] For the first time the shopper will experience Internet type marketing in the traditional sales and advertising venue.

[00494] Here are the benefits consumers could see from shopping center using the disclosed technology:

Better in-mall events-- the system can monitor how successful they were by monitoring the sheer volumes of people attending and for how long.

Provide shoppers with next generation sales tools: navigation in your mall store facility directly to the sales or specials that you want them to go to ....

Add-on to the store/mall directory and the in-store mall flyer.

Take the guessing from the customer's next want ...and then send them directly to the products, coupons, or specials they might want.

Improved public transport links-by monitoring how people traveled to a center. With the government's current emphasis on helping people to use public transport more effectively, having this kind of information can have a very positive, local environmental impact. Busy shopping centers can otherwise create large volumes of extra road traffic, also with the search4parking and return2parking application improves traffic, saving time and gas.

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Eliminates congestion within the shopping center-- the disclosed innovation can help center management understand whether opening hours need to be extended or whether the center layout needs to be improved to avoid congestion.

Improves shopping center and public facilities efficiently- the disclosed innovation's data helps managers to understand which parts of their facility are very busy which means they know when to deploy extra employee/cleaners/security to ensure proper service.

Better security--over-crowding also leaves shoppers vulnerable to pickpockets and other security risks. The disclosed system can identify congested areas and ensure security personnel are deployed appropriately. And in an emergency the disclosed system can provide instant alarm and notification even if the cellular communication or other system is not available.

Improved mix of stores and center layout-the system helps identify which stores are popular and which are not- making sure that the best possible layout and mix of shops is provided for visiting shoppers. If some shops are unpopular they can be switched for brands that customers actually want.

[00495] It is believed that shopping should be an enjoyable pastime. Who wants to go to shopping center that are congested, poorly laid out, have dirty toilets, are badly positioned for transport links and which pose a security threat to visitors? Altogether this makes for a much better shopping experience.

[00496] How do shopping center owners and retailers benefit? The benefits for shopping center owners of using the disclosed technology are huge and there are many possible uses for the information gathered. The disclosed applications can help shopping center owners get a better understanding of how people use their center such as the order of stores they visit and the time they spend in different areas of the center.

[00497] These days, visits to shopping malls are falling with increased competition from supermarkets, retail parks, and the Internet. With visit frequency going down it is critical that the shopper experience at the mall is exceptional and that is where the disclosed applications come in. The information can assists malls at all levels, from the very mundane to the more strategic

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questions that they face-such as whether or not they have the right mix of retailers across the mall.

[00498] Similarly it could help museums identify their most popular exhibits and help exhibition companies plan their venues more carefully around visitor traffic flows.

[00499] The disclosed technology is able to provide a solution with quantitative feedback on whether the changes they make in the mall are successful. One of the ways to do this is by looking simply at how long shoppers tend to stay within a mall.

[00500] Don't retailers already measure shopper numbers? Yes they have infrared cameras and counting machines, which monitor and count the numbers of visitors to their stores. This measure is known as "footfall" and has been used by retailers for many years. The disclosed system provides another level of data by looking at the aggregate paths that mobile phone carrying visitors take and the length of time they spend-known as "dwell time".

[00501] In the past malls have focused solely on looking at the numbers of shoppers that they are drawing through the doors (footfall) but when combined with dwell time they can get a much more accurate predictor of their performance.

[00502] The system has no idea who the user is an individual. The system only looks at the path the user's phone takes. Essentially, it's like looking at a dot moving around a screen. In isolation this information isn't too interesting until you look at the wider patterns and trends and see lots of dots taking the same route or visiting the same areas of the mall.

[00503] What is the Bluetooth ID number? A Bluetooth ID is like the IP number in a computer network or the Internet which does not contain or reveal your phone number that the network operator uses to identify your phone. The system utilized the ID information as a key to find and detect the user.

[00504] The linkage between this identifier and your personal information is very critical to the business owner as it can provides a user habit preference profile and provides a new breed of tools to the business owner just by getting to know where the user is, and at the same time to provide the user with the best “VIP” like personalize shopping services.

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[00505] The disclosed applications do not detect any personal information and have absolutely no idea who you are as an individual. Although the applications include an option for users to register as mall/store customers to provide more details about you (still no real ID), like a membership cards that will be provide the user with incentives, coupons, or special discounts if they participate. Moreover recent emergency events prove the need for emergency and notification to the "right people" at the "right time", by keeping the key/ID of the Bluetooth devices that are in the area/facility the disclosed nav4emergency can provide instant alarming and notification and navigation to the exit route and to safety all without revealing user ID or breaching privacy of the users.

[00506] The business model-Next Generation Marketing: The web advertising and the main focus of search engine success is based on technology that tracks the web user's habits and provides him with related ads according to his interests.

[00507] Using the disclosed infrastructure of a Bluetooth beacons, wherein the beacons are deployed about in a mall, store or shopping center environment. The disclosed invention represents a very unique ability to bring a web like shopping experience by its ability to keep up on the "user's" "surfing" or shopping habits in the shopping center, mall, or store. It will provide a better shopping experience (coupons, specials sales, according to the user's shop- ping habits) and service to the shopper.

[00508] Even though it may look like a privacy issue, the add-on services, the application, and the idea that it may save the user's life (nav4emergency application) combined with the fact that it does not reveal the person's name or telephone number, it is the same as the everyday use of surfing the Internet when the user's IP is recorded by the web sites and provides the basis for the "ad sense" or the web marketing tools, referred to as a "sale-sense".

[00509] It is believed that introducing the disclosed system and the associated marketing tools above can help the users and the sellers to upgrade the real shopping experience of today with the advantage of the web like tools.

[00510] The disclosed innovation represents the next generation shopping experience in shopping centers, malls and fits very well with today's business model. Such a service can be

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offered for free to the "users" and backed by advertising and the use of the data by the stores. Such service and application and the ability to include the emergency part of it will also ease the fear of "locating" or any privacy issue.

[00511] For the first time the shopper will experience Internet type marketing in the traditional sales and advertising venue.

[00512] The disclosed innovation provides valuable solutions that enhance the effectiveness of ad campaigns. The ability to optimize performance in real time has a positive effect on advertiser satisfaction. The fact that this service is well integrated into the disclosed system is a tremendous advantage.

[00513] The disclosed innovation is a performance-enhancing technology, providing great data and allowing improved customer service.

[00514] It can be an extremely effective way to optimize the performance of offline/online advertising campaigns in the mall/store environment. For excellence in client services the idea is a clear win-win for everyone.

[00515] Helping to understand where users are going in the mall/store in real life and their buying behavior patterns will allow the merchants to continually adjust offers, placements and creative content to improve buy-through and maximize sales.

[00516] The disclosed technology will evolve mobile content into a bonfire revenue center that will benefit the shopping mall operator and merchants alike.

[00517] The "user" is in complete control. He can disable his Bluetooth application- any time or just reject content, there is no "spam" effect and the "user" is attracted by incentives rather than generic promotions. Probably the best technical analogy would be to compare the disclosed technology with existing web-based systems that measure viewers of web sites, for example Google Analytics.

[00518] For example, the Bluetooth beacon can broadcast an RF signal that includes its position coordinates (e.g., latitude, longitude), which can be detected by a mobile device. The position coordinates can provide a third location accuracy for the current location of the mobile

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device by virtue of the mobile device adopting the position coordinates of the beacon as its own position coordinates.

[00519] The known locations of a number of beacons in a geographic region (hereafter a "beacon infrastructure") can define a geofence that encompasses the geographic region. In some implementations, the beacon can also advertise location based services provided by the beacon infrastructure. Upon determining that the mobile device crossed the geofence defined by the beacon infrastructure. The application can monitor for beacon signals and continuously update its location to be the location of the beacon currently in proximity with the mobile device.

[00520] When the mobile device loses contact with the beacon for a defined period of time (e.g., 5,10 minutes) or when the mobile device exits the geofence defined by the beacon infrastructure, the application can transfer the monitoring back to the application subsystem, so that the location of the mobile device can be determined using Wi-Fi and or Cellular ID.

[00521] In some implementations, the application can distinguish between beacons in the beacon infrastructure and mobile beacons that may be detected in a scan, such as other Bluetooth enabled mobile phones operating within the beacon infrastructure.

[00522] For example, each beacon in the beacon infrastructure can provide data in its broadcast signal that indicates that the beacon is part of a beacon infrastructure. Alternatively, or in addition, when a mobile device makes first contact with a beacon in the beacon infrastructure, that beacon can transmit to the mobile device a list of unique identifiers (e.g. beacons ID) of other beacons in the beacon close infrastructure and other information about the beacon infrastructure, such as a name, geofence data, one or more URLs to websites associated with the beacon infrastructure. Beacon infrastructure can be located in any geographic region, including businesses (e.g., shopping malls, retail stores, restaurants), landmarks (e.g., museums, airports, parks, entertainment venues) and any other environments where location based services are desired.

[00523] The system use and costs should scale well with its ability for multi-use in an emergency and in a non-emergency to provide local navigation on malls/store campuses,

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buildings, hospitals, hotels, malls etc.... using the Bluetooth beacon for navigation. Some of the key applications are:

[00524] NAV4Mall NAV4Store NAV4Sale or just University or Building Navigator, explore the indoor mall or inside a department store, navigate to the right place or the store or the department that you need. Navigate on the mall map/store mapping to find your way around all using your cellular phone or navigation system without a GPS. A new kind of service and new marketing way for the malls/store business owners, an add-on to local advertising.

[00525] With an indoor navigation based on the local map/ mall that will provide the user a navigation to his desired location in the mall/store and receives content according to his preferences or habits the user can be directed to a store/product even isle inside the store as well a new marketing tool to the store/mall owner to get the customer with a new service. The store will have also an option to deliver more content (advertising, sale, coupons, promo etc....) to the user when he approaches the store or already is inside via Bluetooth or Internet push to the user cellular Bluetooth enable. And in emergency-the nav4emergency will kick in, the nav4store mall module is the one that is described in more details in the patent application.

[00526] NAV4Museum NAV4Conference NAV4Show, explore museums or conference show exhibits in a new unique and easy way, find your way around when navigating on the floor map of the museum conference or the show, indoor navigation, navigate to exhibits restaurants, cafes, lavatories etc.... all to the "user" navigation or cellular phone. Any Museum Conference or show provided to the attended a mapping to the exhibits, some provide also additional audio device (headset) to get more information on the exhibits. The disclosed innovation will provide a unique indoor tools that will allow the attended to navigate the museum, conference or show in an easy way directly to his Bluetooth enabled cellular phone, when he reaches his desired exhibit he will be allowed to download directly to his cellular and or Bluetooth headset information about the exhibits. An indoor navigation to the exhibits as well to the restaurants, cafes, lavatories etc.... All to the "user" navigation or cellular phone and based on the facility map. And in emergency-the nav4emergency will kick in.

[00527] For all the users of mass transportation system the disclosed innovation will allow, locate, and point the "user" to the exact station or location on a route, an easy way to navigate in

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the train, subway, underground kind of system, a new way of "subway" or bus mapping in/out door and directly to the user's navigation or his cellular phone. Every day millions of people are using the mass transportation system, trains, sub- ways, buses, each of the passengers depend on the transportation map for the route information as well as schedules and additional services provided by the transportation system. Most of the passengers of today carry with them a cellular phone.

[00528] Such method can be used by the management of the transportation system, train, buses, taxi and road management where the RF beacons can be installed in any transportation facility or entity to provides traffic and even on-demand transportation request as well as on-line real time traffic and transportation "head count" of the mobile device exiting in the local area according to associate with a proximity beacons installed in the transportation entity of transportation infrastructure ether parking, traffic, sign, schedules and time to station and traffic – how many people at the station or bus stop or at area to create a need to taxi or public services as on-demand service.

[00529] Aside from such data gathering and the important of such statistically information to manage the flow of transportation in a local area where the beacon serve as "sensor" to detect the traffic in specific area to be monitored by collecting how many device are in that location and in event of emergency can provide emergency notification and alarming the local devices.

[00530] The method explained can be used to manage the transportation and provides automatic awareness into transportation managements and operators as well as the user on the road where he can automatically get information about traffic in his area generated from associates, his cellular id and/or the car Vin broadcasting method (a method where the car himself become an a long range RF beacon) and an RF beacon installed on the road – automatic traffic information that tracks the existence of the user in the area and proximity to a beacons installed in the road/transportation facility (even the traffic at intersection). infrastructure of wireless beacons to the benefit of transportation industry managements by providing automatic crowd sourcing data from the users along the road By delivering the beacons id they proximity to and have it statistically view as data guttering for events like traffic on the road automatically, adding such technology and infrastructure into the roads may take time so the use of the driver

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and passenger or the pedestrian cellular phone as a beacon and as automatic traffic notification can provide instant infrastructure- dynamic immediate deployment for the benefit of the transportation as well as the drivers in view of the driver and or the passenger and even the car can be set as a beacon and part of the automatic transportation system to alert for traffic and road safety and even for a car to car automatic notification of traffic and road information.

[00531] The disclosed innovation provides the passenger with the navigation inside the transportation system directly to the passenger's Bluetooth enabled phone; the passenger will know the exact location/station on the route as well as additional information on options like schedules. A new add-on service to the transportation providers as well to the passengers utilizes the disclosed indoor navigation method, and in an emergency-the nav4emergency will kick in.

[00532] The disclosed idea of implementing RF beacons alone the roads and in transportation facilities is designed to reduce the growing congestion on the roads and by providing a tools to provides intelligent transportation system, the implements of beacons can be part of a car, installed in red lights or in the road or in transportation facility, such system that installed in bus or subway or transportation entity n provides real time on line report if they empty or filled with travelers but just provide the automatic response from the user/car device associate with the RF beacons that will be installed in the bus/train the information will allow transportation control that can be done today only with installed high cost camera or sensors or depend on manually collect information from the users or GPS, and the GPS is not available indoor or provides an accurate information, in a simple way the user mobile phone automatically inform his "proximity" beacon ID, more of the same beacon ID reported meaning traffic or head count of cars/travelers etc.. in the transportation facility/entity area, in a way the method provides an "automatic waze" system, such system can even replace exiting sensors and provides the user as well of the transportation management with ability to know exactly where the bus/train/subway at a time, the data can be serve for schedule or on-demand public transportation, like sending bus/taxi to an area according to demand in the area. Such method can provide the user as add-on traffic and transportation information where he – the user play big part of it and it is not depend on manual transfer of information that some time proven to be not accurate enough. One application creates an echo system where the drivers of cars and the transportation entity are all integrated for an intelligent transportation system of tomorrow and all based on the same concept

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of infrastructure on RF beacons statics or dynamic in location where the user mobile phone as well as the car are integrated part of such system. Note that a mobile device as well as any Bluetooth device (desktop, laptop, tablet and cars etc.) can become also a beacon providing a new echo system where an infrastructure can be including static and dynamic deployments of beacons interact with each other's. Again, adding such technology and infrastructure into the roads may take time so the use of the driver and passenger or the pedestrian cellular phone as a beacon and as automatic traffic notification can provide instant infrastructure- dynamic immediate deployment for the benefit of the transportation as well as the drivers.

[00533] NAV4Theme Park -Theme and amusements Park navigation, navigate to your desire attractions as well with a new way for register to a "fast pass" kind off lane all in an easy way to the "user" cellular phone without the need for GPS Provides a new media and-on service. Ever wonder what it will be like to navigate inside the amusements park to the desired attraction, to know the schedules of the shows at the attractions and even to get your "fast pass" from a remote location instead of standing in line. All based on RF beacons that installed in the local attraction points and provides the triggering mechanism for guide navigation and the additional information about the ride/attraction. With the disclosed unique innovation, all can be become reality and directly to your cellular phone without the need for a GPS. It is understood that this technology can provide a new tool and service to the benefit of the amusements parks as well to the user.

[00534] Cellular next "Killer Application": Emerging technology markets are always on the lookout for that elusive "killer app"-the precious, irrefutable application that makes adopters stand up, take notice, and open their wallets. Once it's found, and as soon as adopters realize firsthand the value to be achieved, that killer application eventually expands into other, more advanced areas of adoption and innovation.

[00535] Hotel resort and cruise ship: A good example of use will be Nav4 Hotel Resort Cruise ship. The benefit of the proposed system and infrastructure of installed RF beacons in such places as cruise ships, hotels, resorts, and hospitality facilities to the business and to the guest.

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[00536] The subject invention creates infrastructure of RF beacons in the facility, hotel, resort, and cruise ship areas to be integrated with the existing hospitality system and provide a trigger mechanism when the existence of the traveler/guest is detected.

[00537] The association between the guest mobile phone or the hospitality employee mobile phone and the RF beacons ID will allow the example option below, as such there is two parts for the system to work, the infrastructure of the RF beacons installed in the local hotel, resort or cruise ship and the guest or employee mobile phone with the Bluetooth and or Wi-Fi and the application, note that the system can be work even without Internet and/or cellular communication and can utilize existing Wi-Fi system and local servers.

[00538] Example of some of the benefits and functionality to the hospitality system are:

Automatic check-in and interface to the front office system and billing folio

Link to key system or even replace the room key.

Recognize guest in-room, turn on Air condition and light – and turn off when the guest leaves the room to save electricity can be setup to automatic or manual.

Hotel resort cruise ship navigation.

Allow local messaging without Internet and or cellular communication based on local chat (especially fit to the cruise ships).

Allow push messaging to the guest by local services or by remote (when Internet is available).

Replace and ad-on to the guest in –room package of the area guide and deals and coupons.

Option of VIP services where the guest can be recognized automatically around the hotel, resort, and cruise ship for his profile preferences just by being in the area – providing personal treatment and services.

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Room can be set to be open or close to clean according to guest or housekeeping existence.

Housekeeping management room status attended worksheet and productivity report.

Increase security to the guest and to the hotel resort.

Allow the creation of profile preference of the guest companies group.

Provide check-in to a restaurant interface to a POS system bar system and menu selections.

Provide automatic ticketing and seat selection.

Guest loyalty, membership program incentive.

Increase security and provide add on to the security plan of the hotel, resort, and cruise ship to be part of the emergency evacuation and emergency procedure.

[00539] It is believed that the disclosed invention will meet the desire of hospitality service providers to increase their average revenue per user.

[00540] The main object of the present invention is to provide the indoor guide navigation and a special application for indoor use without the need for GPS communication.

[00541] It another object of the present invention to provide a method of providing special indoor application using an RF beacons Bluetooth and/or Wi-Fi and Bluetooth-enabled devices especially the cellular phone.

[00542] It is another object of the present invention to provide a method of special application for local business, mall/departments store or regular store, buildings, downtown centers and other facility area especially but not limited to indoors with a use of triggering application that uses the proximity ID of the detected beacons in the area.

[00543] It is another object of the present invention to provide a marketing model method especially but not limited for the LBS market.

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[00544] It is another object of the present invention to provide a business model method especially but not limited for the LBS market.

[00545] The foregoing and other objects of the present invention are achieved by providing an infrastructure of a Bluetooth beacons/tags installed in a known location in the area/facility, each tag/beacon has his own unique ID to ID the location in the area, the tags/beacons broadcast the ID to be pickup by the cellular Bluetooth mobile device.

[00546] An indoor mapping or mapping images of the area/facility will be part of the application and can be download before arriving to the area/ facility or trigger download at the area.

[00547] The application on the cellular phone/Bluetooth enabled device will scan the area/facility for the tags/beacons ID/name when a Bluetooth tag that matches the list responds to proximity detection and establishes a signal strength that may be calculated and when more than one beacon signal receives a simple triangulation can be done to find the current location. Other Bluetooth device not on the list will be filtered out.

[00548] The locating is established and will be displayed on the map. And because the location of the other tags/beacons is known navigation between the current location and a desired tag/beacons that represent waypoints are easy to achieve. In reality no communication is established at all between the tags/beacons and the cellular phone.

[00549] The disclosed innovation reverses the current idea of "locating" the user by letting the user navigate utilizing to the beacons of Bluetooth beacons (whose signal is sent by way points) directly to the user's mobile device. This will allow LBS (Local Base System) navigation, even indoors without GPS or Cellular network as well as triggering application and even link to existing system and software.

[00550] The RF beacons can reach from long distance depending on the application and the antenna used by the RF beacon (to get more accuracy less range and more beacons may needed so the 10 m is more than needed in building/room environment) getting more range to the "box" is as simple as attaching a bigger antenna or power buster to increase the signal.

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[00551] The user is in a complete control, they have the choice to turn it on or off at any time.

[00552] User can choose to be registered: membership privilege, student in a university, school, and business especially for receiving direct incentive specials coupons etc.... and for a full nav4emergency protection.

[00553] The disclosed applications let the user choose between participating and receiving incentives, specials, sales, coupons and local content tailor to the user preference, all for free, or they can choose not to participate and pay a small fee for the service and the software. In any case the user's privacy is still protected to the highest level compared to any normal daily use of the Internet ...!

[00554] There is also a great benefit to the user participating-they can have full emergency notification directly to their phone and in an emergency they can be directed by the emergency procedure in the area/building/mall/store and navigate to the exit route, even if the cellular network fails due to the high volume of traffic occurring in an emergency situation.

[00555] In the disclosed method, there is no detector or tracking for the user, the user themselves engage the scanning and detecting method to find the beacons in the area the user device with the proximity scan beacon providing the triggering mechanism.

[00556] Other than that, the proposed solutions create a full suite of applications for the benefit of the user, from parking to sales specials to indoor navigation, to be informed and notified in case of an emergency and directed to the exit route to safety.

[00557] The disclosed method can be attractive not only for shopping malls, department stores, or downtown strips but also to high-rise buildings, commercial buildings, universities, schools, museums, amusements parks, trains, subways, and hotels. It can also be attractive to search engines, advertising companies, cellular phone operators, manufactures, GPS companies, mapping, local businesses, local advertising, location based services (LBS), and the like. The disclosed method can give the LBS a new meaning-the business model that's made easy.

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[00558] A facet of behavioral targeting has been around for a while but mostly on-line but it's been gaining traction among ad agencies retargeting program is now a key planning consideration for its advertisers.

[00559] Why? The primary reason is because retargeting is a powerful means to bring lift to ad campaign results, generating higher conversion rates and lowering acquisition costs. You can't get much more effective than targeting a person who has shown interest in a product but didn't buy with a related ad that then gets him to buy, right? It generally fails to tap the unique opportunities of local advertising market estimates to be over $150 Billion in US alone . . ., Although people are spending more than 90% of their time indoor, there is no clear technology to provide indoor navigation and not clear business model, the advertisers, the business are disillusioned with the promise of location base services (LBS) but are still longing for a solution that properly addresses the significant audience represented by the explosion of cellular phones use and the availability of content.

[00560] It is understood that the disclosed innovation technology and business model can provide the next generation method for the LBS market to tap into the huge market opportunities.

[00561] The disclosed methods represent a very unique way of locating the exact location, in the method the user scans the area for a known list of beacons/tags, the user controls the scanning of the area for the known tags ID type, in reality there is no communication to be established at all between the user and the beacons (no pairing needed!), the user device scans the area for a known tags and the determination of the location done by beacon ID and signal strength to the proximity to the tag/beacon provides accuracy less than 5m.

[00562] Added to the navigation feature is the special indoor application design especially for indoor/store/mall shoppers from finding where the user parked his car to find/search of directory to an emergency alarming and notification.

[00563] Moreover this innovation is not depended on cell communication or Internet for the detection method as there is no need for central system nor expensive infrastructure, in fact the user device-cellular phone as well with the infrastructure tags/beacons have battery built in and can work even if the electricity is out, very important in emergency situations.

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[00564] Moreover the sale sense marketing method comprising a unique way of delivering local content, advertising, coupons, special sales etc. pin point according to user ID and or profile preference that can be a record of behavioral activity and will provide simple and secure method for targeting user for LBS services and other services replacing like near field communication for marketing and even payments transactions.

[00565] The disclosed innovation provides a full line of indoor navigation application especially to places/area

[00566] An indoor navigation system may include a navigation computer, an arrival detection system. The navigation computer may be configured to receive a destination to which a user of the mobile navigation system wishes to travel and to provide guidance to the user about how to navigate to the destination. The arrival detection system may be configured to automatically detect when the mobile navigation system has arrived at the destination by being in a proximity to an RF beacon ID in the local area. The detection system is based on sense or scan of the existence of RF beacons installed in the local and be configured to wirelessly transmit automatically an arrival notice indicating when the user detects the existence of a proximity of a RF beacon and detects that the user has arrived at the destination in response to detection by the detection system of the arrival of the mobile navigation system at the destination.

[00567] The mobile navigation system may be part of a cellular telephone or any navigation device using a Bluetooth, part of the detection is a notification system is configured to wirelessly transmit the RF beacon ID of the proximity beacon and to associate the mobile ID of the user to determine the exact location of the user to provide for example: arrival notice to a representative of an airline. The arrival notice may be configured to cause the user to be checked into a flight of the airline.

[00568] The system may be configured to wirelessly transmit the arrival notice to a representative of a hotel. The arrival notice may be configured to cause the user to be checked into the hotel.

[00569] The system may be configured to wirelessly transmit the arrival notice to a representative of a food service.

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[00570] The arrival notice may be configured to trigger payment for merchandise or a service.

[00571] The arrival notice may be configured to trigger the delivery of merchandise or a service to a vehicle in which the user is traveling. The arrival notice may include information about the location of the vehicle.

[00572] The arrival notice may be configured to trigger promotional items to be delivered to the user relating to an establishment at or near the destination.

[00573] The system may be configured to wirelessly transmit the arrival notice to a representative of a conference that has been scheduled to take place at the destination.

[00574] The system may be configured to wirelessly transmit the arrival notice to multiple recipients. The multiple recipients may include attendees of a conference that has been scheduled to take place at the destination.

[00575] The system may be configured to wirelessly transmit the arrival notice to a social networking site in a fashion that causes notice of the arrival of the user to be published by the social networking site.

[00576] The system may be configured to ask the user for permission to transmit the arrival notice.

[00577] The system may be configured to automatically transmit the arrival notice upon detection by the arrival detection system of the arrival of the mobile navigation system at the destination.

[00578] At the time the navigation computer receives the destination to which the user wishes to travel, the system may be configured to ask the user whether the user wants the arrival notice to be transmitted in response to detection by the arrival detection system of the arrival of the mobile navigation system at the destination.

[00579] The system may include a global user setting which a user may set to automatically transmit or not transmit arrival notices in response to detection by the arrival detection system of the arrival of the mobile navigation system at destinations.

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[00580] The system may be configured to ask the user to where it should transmit the arrival notice, to receive information indicative of this requested location from the user, and to transmit the arrival notice to this location.

[00581] The system can create and utilize a network, which is referred to as dynamic deployment. The system will use the built-in Bluetooth protocol stack module that is able to simultaneously interconnect with other local devices, such as portable cellular phones in a "piconet", over the local area. The simultaneous connectivity limit of eight (8) devices at a time is overturned by the ability of creating a plurality of piconets which operate in a close proximity. It is understood that the Bluetooth enabled devices, such as portable cell phones, can rapidly move from one piconet to another. In fact, the Bluetooth devices need only remain a member of a piconet for the period of time required to complete one communication transaction. So the Bluetooth enabled devices can join and leave a local piconet frequently, effectively overcoming the eight (8) device limit. It is noted, even without the option to use a long range Bluetooth antenna, the configuration can effectively reach an unlimited distance.

[00582] The proposed invention provides an ability to form a wireless as hoc Bluetooth network or networks based on a collection of Bluetooth mobile devices that dynamically form a temporary network as long as these device are within a sufficient range (inside a room or a building, road store or a mall). The flexibility of the ad hoc network is what makes it a suitable choice for emergency deployment scenarios, where multiple devices would be deploy in a proximity area that is designated as an emergency to provide a new way of distributing emergency and alert information directly to those in the needed area.

[00583] Moreover, based upon normal human behavior, there is no need to inform everyone in a full room, or requiring all of the proximity devices participating in the network to be informed (for example in emergency). If only a few people within the occupied room are informed or receive the emergency information on their portable cell phone, they will convey the information to others located in the area..

[00584] The same method and idea is mimicked by the concept of dynamic deployment. The concept can be paralleled as a new way to deliver critical emergency alarming and notification without infrastructure in the localized area.

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[00585] Moreover, the limitation of Bluetooth coverage can be overcome by utilizing the capabilities of the Bluetooth protocol in the methods described above. For example, in a very large conference location, the localized Bluetooth network (piconet) can join each other and form a larger network that covers the entire facility, which is much larger than the limited coverage of a single Bluetooth device. Portable cell phones located at one end of the facility can communicate with a second Bluetooth enabled device located at the opposite end, where the communication traffic is relayed by one or more intermediary, bridge devices. Any Bluetooth device, in our example Bluetooth enabled cellular phones, can become the bridge. The cellular phone owner does not need to know whether his/her device is a bridge, as the process is established and functions automatically as part of the Bluetooth protocol stack routine; in effect not changing any internal behavior of the Bluetooth.

[00586] And again, there is no need to reach all the people with an emergency or other message, as if the message were conveyed to only a few in a room, at least a portion of those would inform the remaining people of the emergency message.

[00587] Moreover, the present innovation will allow the user to use a "local instant emergency messaging system". The dynamic deployment configuration provides the ability for people to communicate with one another in the same local proximity using Bluetooth, where the people can chat and exchange important messaging for free exclusive of a need for a cellular network. Just think what it can be done in emergency or even in army deployment as other communication method.

[00588] From the old days in history, humans used messengers to deliver news and information. The disclosed invention uses applies these older concepts to a device that will make it easy to distribute and broadcast the information around, using the messengers as the mobile (emergency) notification, as referred to as dynamic deployment.

[00589] These, as well as other components, steps, features, objects, benefits, and advantages, will now become clear from a review of the following detailed description of illustrative embodiments, the accompanying drawings, and the claims.

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BRIEF DESCRIPTION OF THE DRAWINGS

[00590] The preferred embodiments of the invention will hereinafter be described in conjunction with the appended drawings provided to illustrate and not to limit the invention, in which:

[00591] FIG. 1 presents a schematic diagram representative of an infrastructure deploying a series of radio frequency(RF) wireless beacons;

[00592] FIG. 2 presents a schematic diagram representative of an indoor mapping system utilizing RF wireless beacons, wherein the diagram depicts an exemplary application within a shopping mall environment;

[00593] FIG. 3 presents a schematic diagram illustrating basic exemplary functions of an indoor mapping application as used on a mobile or cellular phone;

[00594] FIG. 4 presents an exemplary flow diagram representative of an indoor detection and navigation process;

[00595] FIG. 5 presents an exemplary series a gradient concentric circles indicative of a location;

[00596] FIG. 6 presents an exemplary flow diagram representative of a business based application utilizing a series of deployed RF beacons;

[00597] FIG. 7 presents an exemplary flow diagram representative of a marketing based application utilizing a series of deployed RF beacons, wherein the marketing based application utilizes a profile, preferences, and other information for sales and marketing purposes;

[00598] FIG. 8 presents an exemplary schematic diagram representative of a series of functions or applications associated with a series of deployed RF beacons, wherein the series of functions or applications are generally directed for use with an RF beacon infrastructure deployed within an indoor environment.

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[00599] FIG. 9 presents an exemplary schematic diagram illustrating an infrastructure employing RF beacons deployed in the indoor environment;

[00600] FIG. 10 presents an exemplary schematic diagram representative of a series of functions or applications associated with transportation and/or telematics applications, wherein the series of functions or applications are generally directed for use with a static and/or dynamic RF beacon infrastructure;

[00601] FIG. 11 presents an exemplary schematic diagram representative of a series of functions or applications associated with hospitality based applications, wherein the series of functions or applications are generally directed for use with hospitality related businesses and environments;

[00602] FIG. 12 presents an exemplary flow diagram representative of a next generation marketing tools employing RF beacon technology; and

[00603] FIG. 13 presents a schematic diagram illustrating an exemplary dynamic deployment of an RF based network for use in a variety of applications, including mobile to mobile communications, car to car communications, and emergency or local communications.

[00604] Like reference numerals refer to like parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[00605] In all the figures of the drawings, sub-features and integral parts that correspond to one another bear the same reference symbol.

[00606] Referring now to the drawings in detail and first particularly to FIGS. 1-13 thereof.

[00607] FIG. 1 presents an exemplary flowchart illustrating a use of RF beacons (102). The RF beacons can utilize at least one of Bluetooth and Wi-Fi signal protocols. The exemplary system utilizes a mobile cellular phone (101) to scan and detect a proximity of an installed

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beacon (102) in the most part for determining an indoor or outdoor location in a proximity to a known location of the installed beacon(102) and for initiating or triggering a notification of an existence to indoor and/or outdoor navigation and delivery of local content according to the determined location. The same method can be used by fix computers or portable computers (103), portable devices (104), pedestrians carrying a portable device (105)(such as a cellular phone), or a vehicle / car (106) that can be equipped with RF Bluetooth or Wi-Fi technology. It is noted that the static beacons (102) can be assisted by including other portable RF Bluetooth or Wi-Fi enabled devices within the network, thus creating a dynamic network. It is understood that a number of applications can be provided utilizing the infrastructure created by the series of deployed beacons. Additionally, the applications can utilize a precise location of the user, wherein the location is determined by information provided by beacons signals emitted from each of the deployed RF beacons (102).

[00608] FIG. 2 presents an exemplary use of the RF Bluetooth and/or Wi-Fi beacon infrastructure deployed in a mall environment. An indoor map (200) of the mall interior is downloaded and saved or installed on the cellular phone (101). The indoor map (200) includes building structure layout, business locations and descriptions, and known RF beacon (102) locations throughout the associated mall, building, or other facility. The RF beacons (102) can be deployed inside stores or at as any other Points of Interest (POI) located throughout or around the mall. Information associated with an RF beacon (102) located proximate the cellular phone (101) can be forwarded to the cellular phone (101) by the beacon signal. The associated information (109) can be displayed upon the cellular phone (101) as illustrated. A location of the beacon signal receiving device (such as a cellular phone (101)), can be determined based upon a close proximity to one or more of the RF beacons (102) of the series of deployed beacons, which create the infrastructure. The precise location of the receiving device (101) can be determined based upon an identified beacon ID and a signal strength from the detect beacon (102) or beacons (102). The precise location can then be displayed upon an indoor map (200), as shown in FIG. 9.

[00609] FIG. 3 presents an exemplary operational process completed by the cellular phone (101). The mobile device (101) activates an application program for indoor mapping of the facility, building, structure, and the like (200) and scans a local area for RF beacons (102) to

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determine the precise location (302) of the mobile phone (101). The location of the mobile phone (101) is determined done by scanning the infrastructure of RF beacons (102), wherein each beacon is installed in a known location within the structure, wherein the structure can be a mall, a building, any facility, or any other enclosed structure. The RF beacons (102) can be installed inside stores or at any specific Point of Information (POI), around the mall. The location of the cellular phone (101) can be determined by using information from any RF beacon (102) located in a close proximity to the cellular phone (101). The application would recognize the beacon ID embedded within a beacon signal emitted by the proximate beacon (102). The application would calculate the location of the cellular phone (101) by utilizing a signal strength of the emitted and received beacon signal. This process provides a solution for a user to determine their location exclusive of a global positioning system (GPS), access to the Internet, or any other bi-directional communication. The location of the cellular phone (101) is then displayed upon an indoor map (200) on a display on the cellular phone (101). Should the cellular phone (101) be located in a suitable area and comprise the ability to establish bi-directional communication, the cellular phone (101) can transmit a notification signal or message indicating that the cellular phone (101) is in a region proximate the RF beacon (102), such as by transmitting an "I am here" message to a predetermined recipient. This can provide an automatic check-in process, where the user "notifies" others of his local existence to the local area business to establish his local location. in turn, the system can forward local contents to the cellular phone (101), wherein the local contents would be information associated with the current position of the cellular device (101). The system can be enhanced to utilize a direction of travel of the cellular phone (101) and anticipate approaching beacons. The system would then determine and transmit information associated with RF beacons located along the current projected path of travel of the cellular phone (101).

[00610] FIG. 4 presents an exemplary flowchart illustrating an indoor detection and navigation procedure. A user of the mobile cellular phone (101) approaches a facility/area where the user can download the facility/area map (200) having a series of RF Bluetooth and/or Wi-Fi beacons (102) installed in known locations throughout the facility/area. The application installed on the cellular phone (101) will scan the area/facility for broadcasted beacon signals. Upon receiving a broadcast beacon signal, the application will determine if the received beacon signal is associated with any beacons included in the list of known beacons (102). If the signal is

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determined to be associated with any beacons included in the list of known beacons (102), then the application proceeds with a location determination process (303). The location of the user (cellular phone (101)) is determined to be in a proximity of the identified beacon (102) transmitting the received beacon signal. The location is refined by using a signal strength of the beacon signal of the identified beacon (102) enabling determination of a more precise indoor location of the cellular phone (101). The location is then identified and displayed on an associated indoor map (200). In a condition where the cellular phone (101) fails to receive a beacon signal, the cellular phone (101) continues to scan the area (107). An optional feature includes a step of transmitting a notification of existence upon identification of a location; essentially having the cellular phone (101) transmit a message stating "I am here" (304) to the local area as a way of automatically check-in and/or a method of notifying a system that the user is within a local region. For example, the system can notify a local area business that a user is within the vicinity. In another example, the system can convey local contents to the cellular phone (101) based upon receipt of the notification that the user is within the area. The system can provide the user with a navigation heading (305) to waypoints based upon the current location of the cellular phone (101). In yet another example, the system can transmit Points Of Interest (POI) to the cellular phone (101) as illustrated in FIG. 2.

[00611] FIG. 4 is a flowchart illustrating of the indoor detection and navigation procedure according to an embodiment of the present invention. Referring to FIG. 4, the user with mobile cellular phone (101) approach a facility/area where he can download the facility/ area map (200) with RF wireless Bluetooth and or Wi-Fi beacons (102) installed in the facility area in a known place. The user mobile cellular phone (101) application will scan the area/facility for the known list of the beacons (102), if beacons was found then a location determination process (303) where is location of the user is determine as proximity to the find and match beacon ID, being in a close proximity to a beacon and recognize the beacon ID as well as calculating the Signal strength from the detect beacons (102) allow determination of the precise location indoor and ability to show the location over the indoor mapping (200), scanning is continue if no beacons (407) was found, when found the location is display on the loaded map over the mobile cellular phone(101) or Bluetooth device (103-106), part of the detection is to notify of existence "I am her" (304) to the local area as a way of automatic check-in method where the user "notify" his local existence to the local area business to establish his local location (303) and receive local contents,

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according to his location a heading navigation(305) between Points Of Interest (POI) can be establish.

[00612] FIG. 5 presents an exemplary RF beacon accuracy radius circle (501) that is utilized in at least two distinct manners: one manner is used for the application, and a second manner is used to identify when the user's cellular phone (101) enters and/or exits the area around and in a proximity to a beacon (102) of the series of beacons (102). The central circle (502) and inner circle (503) illustrate different radii from the respective beacon presenting an accuracy of the location of the cellular phone (101). The radius circle (501) would be placed as an overlay circle over a portion of the local indoor map (200). This displayed configuration would identify an accurate location of the cellular phone (101) respective to the proximity of the beacon signal received from the Bluetooth and or Wi-Fi RF beacon (102) installed in the vicinity of the cellular phone (101).

[00613] FIG. 6 presents an exemplary flow diagram of a business application utilizing the series of RF beacons (102) deployed throughout a facility, one or more buildings, a mall, a store, and the like. Each RF beacon (102) can be installed by the facility owner, a business owner (601), an advertising company, and the like. In one application, a business owner (601) would install an RF beacon(102) in their business. When the user of the cellular phone (101) approaches the RF beacon, the cellular phone (101) detects the beacon signal transmitted by beacon (102) in the proximity thereof. The cellular phone (101) receives the beacon signal and determines the identification of the beacon (102) associated with the received signal. Once the location and/or identity of beacon is known, the application initiates a procedure to obtain local content delivery (604) from the business and/or business owner. In one option, the system can provide business or local content (605) to the cellular phone (101). In a second option, the cellular phone (101) can transmit a signal that will directly or indirectly notify the business owner that the cellular phone (101) is located proximate a specific beacon (102), wherein the specific beacon (102) is associated with the business owner's store, located either proximate to or within the business owners store, and the like. In turn, the business owner can provide local content (605) to the cellular phone (101).

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[00614] FIG. 7 presents a flow diagram illustrating an exemplary target marketing feature. The application uses a profile preference provided by the user's cellular phone (101) wherein the mobile device scans the local area and determines the location of the cellular phone (101) using information obtain from a beacon signal broadcasted by an RF beacon (102) and optionally utilizing a beacon identifier (302). The profile preference is associated with the user of the cellular phone (101). The profile preference is provided to the local business in conjunction with a notification that the cellular phone (101) is located in the proximity to the specific RF beacon (702). The process can filter information to determine local based services contents (704), wherein the local based services content (704) is based upon the profile preferences of the Local Based Services (LBS), and the user's behavior (703). The system can determine local based services content (704) such as deals, offers, coupons and specials, and the like, as well as store or business information, and provide the information accordingly to the user through the user's cellular phone (101).

[00615] FIG. 8 presents a series of Local Based Service (LBS) applications that can be utilized in conjunction with infrastructure provided by the series of deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. One application (Parking and Return to Parking (810)) provides a method for searching for available parking spaces and/or a process for assisting a user to return to the parking location of the user's car. The Parking and Return to Parking (810) application can provide parking information within a parking garage, in a mall parking area, for street parking, and the like, wherein the Parking and Return to Parking (810) provides the user with direct navigation to empty parking spots and/or to provide the user guidance to return to the location where the car was previously parked.

[00616] In another application (Nav realty (802)), information associated with real estate is provided to a user using RF beacons (102) installed at each real estate property. Each RF beacon (102) would provide local information about the associated real estate property and can include navigation information respective to the local area real estate directly to the user's cellular phone (101).

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[00617] In yet another application Navmall/store (803), information can be provided to business operators and subsequently, business related information can be provided to the application user.

[00618] In yet another application, Navsale marketing (804), sales, specials, coupons and the like can be transmitted to the cellular phone (101) and/or the system can provide directions / navigation to the user to guide the user to areas displaying items associated with the sales, specials, coupons and the like.

[00619] In yet another application, Navmuseum, Navconference, Navshow 805, the RF beacons (102) would be installed in known locations within a museum, a conference center, and any other related location, whereby the RF beacons (102) directly or indirectly provide information and/or navigation associated with the location to the user of the application.

[00620] In yet another application, Navamusement (819), the RF beacons (102) would be installed in known locations about any amusement park, theme park, or other entertainment venue, whereby the RF beacons (102) directly or indirectly provide information and/or navigation associated with the venue to the user of the application. The application can be enhanced by including an optional feature to assist a user in reducing wait times for access to rides, events, shows, and the like.

[00621] In yet another application, Navemergency (818), the RF beacons (102) provide critical information and/or navigation to the user during an emergency event including instructions pertaining to an emergency procedure, an emergency evacuation map and directions for evacuating the facility to a safe location.

[00622] In yet another application, Transportation (810), the RF beacons (102) would be deployed in a subway, on a train, on a bus, and/or in any mass transit system. This infrastructure would provide the user with information directly to their cellular phone (101) from the deployed RF beacons (102) installed along the route. This gives the user a complete navigation on a map of the train/subway mass transit directly to the user's cellular phone (101). In an alternative mode of the Transportation Application (810), the RF beacons (102) can be deployed along a side of a road, a cellular phone (101) residing within a vehicle, integrated into a vehicle, and the like.

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When the cellular phone (101) is mobile, the cellular phone (101) provides wireless vehicle-to-vehicle communication. One optional feature of this application would be an inclusion of automatic traffic notifications, what can be referred to as automatic "waze", whereby the cellular phone (101) can provide automatic traffic and road notifications. In an alternate embodiment, a Bluetooth device can be located within a vehicle (106) (as either a fixed or a portable device), on a driver (105), on a pedestrian, and the like. The cellular phone (101) can be included as an integral element in gathering traffic information.

[00623] In yet another application, Navsign (811), the RF beacons (102) can be installed along a roadway at locations either proximate traffic signs or at locations exclusive of traffic signs, but would be appropriate for conveying traffic related information to a driver. Each RF beacon (102) would be installed at a location enabling passing vehicles to receive beacon signals from the deployed series of RF beacons (102). The related infrastructure would provide a telematics system to the driver's cellular phone (102), a system integrated into a vehicle, and the like.

[00624] In yet another application, Indoor Navigation (808), the RF beacons (102) can be employed to provide an infrastructure enabling the application to determine a precise location of the receiving device. The application would additionally include a capability of providing navigation between various deployed RF beacons (102). This application provides a solution in areas where the global positioning system (GPS) is ineffective, such as indoors. The system also eliminates a need for bidirectional communication.

[00625] In yet another application, Nav Hotel, Resort, Cruise Ship (816), the RF beacons (102) can be deployed within a hospitality environment to provide an infrastructure enabling the application to determine a precise location of the receiving device within the hospitality environment or venue. Since most of the environments of the hospitality venues are located indoors, this application provides a solution in areas where the global positioning system (GPS) is ineffective.

[00626] In yet another application, Notification/Automatic Check-In (815), the cellular phone (101) is directed to automatically transmit an arrival message, which notifies a recipient that the cellular phone (101) has received a beacon signal from an RF beacon (102) within the

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infrastructure of beacons and that the cellular phone (101) is in proximity of the RF beacon (102). The application can additionally consider elements of the user's profile when determining whether to send the arrival message and/or what is included in the arrival message.

[00627] In yet another application, Payments (814), a payment transaction method can utilize a location determined by the proximity of the cellular phone (101) to an RF beacon (102) of the series of RF beacons (102). The location, the identification of the RF beacon (102) and/or the user profile can be associated with the payment.

[00628] In yet another application, NAV Dating / Social Networking Link (812), a precise location of the cellular phone (101) is determined using information associated with the beacon signal. The location information is then utilized to assist the user in regards to social networking as well as indoor navigation.

[00629] In yet another application, Dynamic Deployment / Local Communication (813), the application establishes an ad hoc network between a series of mobile Bluetooth based RF beacons, such as Bluetooth transceivers of cellular phones (101) to provide local messaging between a message transmitting user and a message receiving user, wherein the message is conveyed through at least one intermediary Bluetooth RF beacon.

[00630] In yet another application, Nav Emergency (818) the RF beacons (102) provide navigation to the cellular phone (101) from the current location of the cellular phone (101) to an exit location using a predetermined optimal emergency exit route. The location and routing would be based upon the initial location, which is determined by a proximity to an RF beacon (102) of the localized RF beacon infrastructure. The application can additionally provide an emergency procedure and any other necessary notifications to the user through the user's cellular phone (101).

[00631] In yet another application, Scanning For Life (817), the cellular phone (101) converts into a beacon in a condition where two-direction communication networks are unavailable by either lack of installation or an outage. The beacon repetitiously transmits a beacon signal using at least one of cellular transmissions, Bluetooth transmissions, and Wi-Fi Transmissions. Search and rescue parties utilize a portable receiver to scan for and locate the Scanning for Life beacon

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signal. The beacon signal can optionally include embedded information associated with the cellular phone (101), which can include specific information associated with the user of the cellular phone (101).

[00632] It is noted that the RF beacon infrastructure enables execution of the above-described application exclusive of cellular communications and/or access to the Internet.

[00633] FIG. 9 presents an exemplary indoor infrastructure of RF beacons (102), wherein the RF beacons (102) are installed in known locations throughout a local area. Each RF beacon (102) broadcasts at least one of a Bluetooth signal and a Wi-Fi signal. The RF beacons (102) enable an application to determine a precise location of the cellular phone(101) on a local map (200). Once the application determines the location of the cellular phone (101) respective to a proximate RF beacon (102), the application can utilize a user profile or profile preferences to obtain marketing information. The user profile or profile preferences can be used to filter information provided to the cellular phone (101). The application can provide information to a remote recipient using Application Information (API (901) triggering or initiating content delivery (604). When triggering content delivery (604), a 3rd party application (903) would respond to the transmission directed by the application by conveying or pushing local content or other associated information to the cellular phone (902). The bi-directional communication can be accomplished using cellular communication, an ad hoc network, an Internet based communication, and the like. In another embodiment, the remote recipient can include a local business owner, thus notifying the business owner that the specific cellular phone (101) is in a vicinity of the business.

[00634] FIG. 10 presents a series of transportation based applications that can be utilized in conjunction with infrastructure provided by the series of fixed or dynamically deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. A portion of the applications introduce telematics therewith.

[00635] One application (Automatic Traffic Alert (1103)) provides beacon signals comprising telematics including traffic alerts.

[00636] In a second application (Dynamic Deployment (1104)), an ad hoc network is created between vehicles providing vehicle to vehicle communication using an intermediary

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communication link. The vehicle to vehicle communication is preferably accomplished using a Bluetooth protocol.

[00637] In another application (Find Parking and Return to Parking (1105)), the RF beacon infrastructure is used to inform a user of available parking locations and/or provide navigation guiding the user to the location where the user parked their vehicle.

[00638] In yet another application (Automatic Traffic Alert (1103)), a driver (105) can employ their cellular phone (101) to deliver automatic traffic information (1103).

[00639] In yet another application (Trigger Application (1102)), the system identifies an RF beacon, which subsequently triggers or initiates an application.

[00640] In yet another application (Local Tracking (1106)), the system utilizes a Bluetooth beacon that can recognize the car/driver ID and subsequently track the car/driver.

[00641] In yet another application (Access Control (1107)), recognition of either a proximate RF beacon or an approaching cellular phone (102) causes activation of a device. This can be accomplished using any of many suitable processes. For example, when a vehicle is approaching a gate, the vehicle would receive a beacon signal from a local beacon. The signal would be deciphered to determine the identity of the beacon. Once known, the system would act according a directive that is associated with the proximate beacon identity. In one example, the system would transmit a signal to open a gate when the vehicle approaches the gate.

[00642] In yet another application (Theft Prevention (1109)), the RF beacon (102) would recognize the vehicle and prevent theft.

[00643] In yet another application (Automatic Payment (1114)), the cellular phone (101), an RF beacon device integrated into a vehicle, and the like, broadcasts a beacon signal comprising a beacon identifier, wherein the beacon identifier is used in conjunction with an automatic payment method.

[00644] In yet another application (Transportation Management (1110)), the RF beacons provide assistance for management of transportation systems.

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[00645] In yet another application (Accident Prevention (1111)), the RF beacons provide assistance for prevention of accidents, such as by notification to a user when two RF beacons become too close to one another.

[00646] In yet another application (Saving Fuel (1114)), the application or series of applications can reduce fuel consumption by optimize navigation, reducing time finding parking spots, provide telematics associated with traffic, provide management support of transportation systems, and the like.

[00647] In yet another application (GPS Add-On Navigation (1113)), the series of RF beacons (102) can be used to determine a location of a receiving device and can additionally be used to obtain navigation. This is particularly beneficial in areas where the global positioning system (GPS) is ineffective (such as indoors).

[00648] In yet another application (Nav Sign (1112)), the RF beacons can convey information associated with road signs.

[00649] FIG. 11 presents a series of navigation based applications that can be utilized in conjunction with infrastructure provided by the series of deployed RF beacons (102) and the methods describes according to various embodiments of the present invention. Each RF beacon (102) contains and broadcasts a beacon signal comprising a beacon identifier to enable a receiving device to determine a precise location of the device within a facility, a mall, a show, a store, and the like. The RF beacons would broadcast a beacon signal using at least one of Bluetooth and Wi-Fi protocol. At least a portion of the RF beacons (102) can be associated with a Waypoint.

[00650] Each of the series of exemplary applications provides a location determining solution and navigation in an environment that is not conducive for the global positioning system (GPS), such as within a mall, a store, a parking garage, and any other indoor location.

[00651] One application (Parking and Return to Parking (1510)), the RF beacons (102) are deployed in a parking area. Each RF beacon (102) includes at least one sensor to determine a presence of a vehicle in the associated parking spot. The RF beacons (102) identify vacant parking spots and provide navigation to each vacant parking spot to a user. The application can

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additionally or alternatively provide navigation directing the user to the parking spot containing their vehicle.

[00652] In a second application (Stores Directory (1520)), a directory of merchants is provided to the cellular phone (101). The directory can include displaying locations of the merchants on a local map (200).

[00653] In another application (Search and Find (1111)), the RF beacon infrastructure is used to provide directions or navigation between known waypoints within an indoor facility, such as a mall. The known waypoints would be displayed upon the indoor map (200).

[00654] In yet another application (Sales, Deals, and Specials (1540)), the network provides information pertaining to sales, deals, specials, and the like to the receiving device. The sales, deals, specials, and the like can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102).

[00655] In yet another application (Entertainment (1530)), the network provides information pertaining to entertainment to the receiving device. The entertainment can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102). The application can additionally provide navigation to a location associated with the entertainment.

[00656] In yet another application (Information and Events (1590)), the network provides information pertaining to entertainment to the receiving device. The entertainment can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102). The application can additionally provide navigation to a location associated with the entertainment.

[00657] In yet another application (Dining (1580)), the network provides information pertaining to dining in the local area to the receiving device. The dining information can be associated with a location of the receiving device, wherein the location would be determined by a proximity to an RF beacon (102). The application can additionally provide navigation to a dining location.

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[00658] In yet another application (Emergency (1560)), the network provides a notification of an emergency situation, emergency procedural information, and navigation from the current location, through the structure, and to a predetermined exit location. The information would be respective to the proximate RF beacon (102).

[00659] FIG. 12 presents an exemplary flow diagram illustrating a next generation of marketing tools utilizing the RF beacon (102) infrastructure deployed in a local area. The network obtains a user's profile or preferences (701) as well as a user's behavioral pattern (704) associated with the user's cellular phone (101). The information is conveyed to a business owner (702) for marketing purposes. The profile and/or preferences are filtered to determine applicable local based services (LBS) (703). The information can trigger or initiate an application (304), establish a link to an existing system and software, and the like to provide at least one of local content (503) and indoor navigation (108) to the cellular phone (101) or similar receiving device.

[00660] FIG. 13 presents an exemplary schematic diagram illustrating a method of utilizing dynamic deployment to create an ad hoc network. Exemplary applications include vehicle-to-vehicle communication, emergency communication, local communication, and the like. The method establishes communication between a series of Bluetooth devices located proximate one another. One exemplary implementation employs cellular phones (101), utilizing the Bluetooth transceivers integrated therewith. The dynamic network is created by placing proximally located Bluetooth devices into an ad hoc or mesh network. The network is based upon overlapping signal transmission radii. The network can include installed and/or mobile Bluetooth devices, exclusive of cellular or other higher powered and costly communication interfaces. The method can be utilized in transportation creating a road size networking of vehicles and/or drivers for telematics or traffic information, a push alert providing road information, and creating a vehicle-to-vehicle communication capability. In another option, the network can be utilized in an emergency situation, more specifically, when and where the cellular network are unavailable, interrupted, down, or fail. The ad hoc network creates a longer range communication capability utilizing local low power Bluetooth and/or Wi-Fi devices to convey information to local emergency responders or other parties. Another optional feature of the dynamic deployment enables creation of an ad hoc network within a structure, a mall, a store, a building, an office, an entertainment complex, and the like, exclusive of cellular communication. The ad hoc network provides

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capability for local messaging between users in a proximity area. The network can be utilized to deliver local content to the cellular phone (101) exclusive of any broader and higher powered communication networks, such as cellular, and the like. The network would be applicable between cellular phones (101) vehicles comprising the appropriate transceiver technology (106), within a facility/building/area, and the like.

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What is claimed is:

1. A method of mapping a localized area comprising an interior of at least one enclosed structure, the method comprising steps of:

deploying a series of beacons about said localized area comprising at least one enclosed structure, wherein at least a portion of said series of beacons are located to transmit within an interior of said at least one enclosed structure;

broadcasting a beacon signal from each beacon of said series of beacons;

determining a location of a mobile device in accordance with following steps:

scanning for any of said beacon signals using a mobile device,

detecting at least one of said broadcast beacon signals,

receiving at least one of said beacon signal by said mobile device, wherein said beacon signal is broadcast from a beacon of said series of beacons located proximate said mobile device, and

determining a current location of said mobile device within said interior of an enclosed structure of said at least one enclosed structure, wherein said current location of said mobile device is determined based upon information collected from said received beacon signal;

determining an indoor map associated with said localized area;

displaying said localized area indoor map; and

displaying said current location of said mobile device on said localized area indoor map.

2. The method as recited in claim 1, where the beacon signal is a short range radio frequency being at least one of a Bluetooth signal and a Wi-Fi signal, the method further comprising a step of:

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transmitting said beacon signal as at least one of said Bluetooth signal and said Wi-Fi signal.

3. The method as recited in claim 1, further comprising steps of:

utilizing beacon signals from said series of beacons to aid in navigation to said mobile device, when said mobile device is located within an interior of a structure where a global positioning system (GPS) is ineffective.

4. The method as recited in claim 1, wherein said step of determining said current location of said mobile device is accomplished by utilizing a signal strength of said received beacon signal.

5. The method as recited in claim 1, wherein said step of determining said current location of said mobile device is accomplished by utilizing triangulation and at least two received beacon signals from at least two beacons.

6. The method as recited in claim 1, wherein said localized area indoor map is a floor plan image of said localized area.

7. The method as recited in claim 1, wherein said localized area indoor map is an indoor image of said localized area.

8. The method as recited in claim 1, further comprising steps of:

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traveling from said current location towards a subsequent location;

repeating said steps of determining a location of a mobile device to determine said subsequent location;

determining a path between said current location and said subsequent location; and

associating said current location and said subsequent location.

9. The method as recited in claim 1, further comprising a step of:

overlaying a series a gradient concentric circles onto said localized area indoor map, wherein said series a gradient concentric circles provide a distance relationship between said mobile device and a secondary object.

10. The method as recited in claim 1, further comprising a step of:

displaying each point of interest (POA) associated a beacon identifier determined from said beacon signal on said localized area indoor map.

11. The method as recited in claim 1, further comprising steps of:

displaying each point of interest (POA) associated a beacon identifier determined from said beacon signal on said localized area indoor map;

selecting a beacon location from each displayed beacon location on said localized area indoor map;

obtaining information associated with each said point of interest (POA); and

displaying said information associated with each said point of interest (POA).

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12. The method as recited in claim 1, further comprising steps of:

customizing each beacon signal by embedding a beacon identifier within said beacon signal, wherein said beacon identifier distinguishes said beacon from said series of beacons;

broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons;

scanning for any of said beacon signals using a mobile device;

detecting at least one of said broadcast beacon signals;

receiving at least one of said beacon signal by said mobile device

decoding said received beacon signal to determine said beacon identifier;

initiating a process for obtaining marketing information associated with said beacon identifier from a remote information provider;

transmitting a request for marketing information associated with said beacon identifier from said remote information provider;

obtaining said marketing information associated with said beacon identifier from said remote information provider; and

displaying said obtained marketing information associated with said beacon identifier on said mobile device.

13. The method as recited in claim 1, further comprising steps of:

determining a floor of said at least one enclosed structure on which said beacon signal is associated with;

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identifying an associated floor map portion of a series of floor map portions of said localized area indoor map, wherein said associated floor map portion represents said floor associated with said beacon signal;

displaying said associated floor map portion of said localized area indoor map; and

displaying said current location of said mobile device on said associated floor map portion of said localized area indoor map.

14. A method of mapping a localized area comprising an interior of at least one enclosed structure, the method comprising steps of:

deploying a series of beacons about said localized area comprising at least one enclosed structure, wherein at least a portion of said series of beacons are located to transmit within an interior of said at least one enclosed structure;

customizing each beacon signal by embedding a beacon identifier within a beacon signal, wherein said beacon identifier distinguishes said beacon from said series of beacons;

broadcasting said respective beacon signal comprising said embedded beacon identifier from each beacon of said series of beacons;

scanning for any of said beacon signals using a mobile device;

detecting at least one of said broadcast beacon signals;

receiving at least one of said beacon signal by said mobile device

decoding said received beacon signal;

initiating a process for providing marketing information associated with said beacon identifier to said mobile device;

obtaining said marketing information associated with said beacon identifier; and

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displaying said marketing information on said mobile device.

15. The method as recited in claim 14, where the beacon signal is a short range radio frequency being at least one of a Bluetooth signal and a Wi-Fi signal, the method further comprising a step of:

transmitting said beacon signal as at least one of said Bluetooth signal and said Wi-Fi signal.

16. The method as recited in claim 14, further comprising steps of:

determining a location of said mobile device respective to said beacon associated with said received beacon signal; and

displaying said location of said mobile device respective to said beacon associated with said received beacon signal on said mobile device.

17. The method as recited in claim 14, further comprising steps of:

determining a location of said mobile device respective to said beacon associated with said received beacon signal, wherein location is determined using at least one of:

signal strength of said beacon signal,

triangulation using two or more beacon signals, and

location information embedded within said beacon signal; and

displaying said location of said mobile device respective to said beacon associated with said received beacon signal on said mobile device.

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18. The method as recited in claim 14, further comprising steps of:

determining a location of said mobile device respective to said beacon associated with said received beacon signal;

obtaining a localized area map associated with said location of said beacon;

determining a location of each of said mobile device and said beacon on said localized area map;

displaying said location of said mobile device respective to said beacon identifier overlaid upon said localized area map on said mobile device.

19. The method as recited in claim 14, wherein said beacon associated with said received beacon signal is located within an enclosed structure, the method further comprising steps of:

determining a location of said mobile device respective to said beacon associated with said received beacon signal;

obtaining a localized area indoor map associated with said location of said beacon;

determining a location of each of said mobile device and said beacon on said localized area indoor map;

displaying said location of said mobile device respective to said beacon associated with said received beacon signal overlaid upon said localized area map on said mobile device.

20. The method as recited in claim 14, further comprising a step of:

utilizing beacon signals from said series of beacons to aid in navigation to said mobile device, when said mobile device is located within an interior of a structure where a global positioning system (GPS) is ineffective.

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21. The method as recited in claim 14, further comprising a step of:

transmitting an arrival notification signal upon arrival proximate to one beacon of said series of beacons to notify at least one other party of arrival at said one beacon.

Google Ex. 1029, p. 558

INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS

Abstract

A series of RF beacons deployed about a localized area to create an infrastructure for use with mapping, navigation, and marketing of merchants in the vicinity thereof. An application would utilize the RF beacons to determine a user's location respective to a local area and inform the user of their location on an associated map. The application can employ the RF beacons for navigation through the local area. The application can utilize a beacon identifier that would be embedded within the beacon signal. The beacon identifier can be utilized to determine a user's location, provide navigation, obtain marketing information for merchants associated with the specific beacon, etc. Receipt of the beacon signal could initiate a feature on the receiving device to transmit a request for information to a remote provider, which in turn, utilizes the beacon identifier to obtain information associated with the area and return the information accordingly.

Google Ex. 1029, p. 559

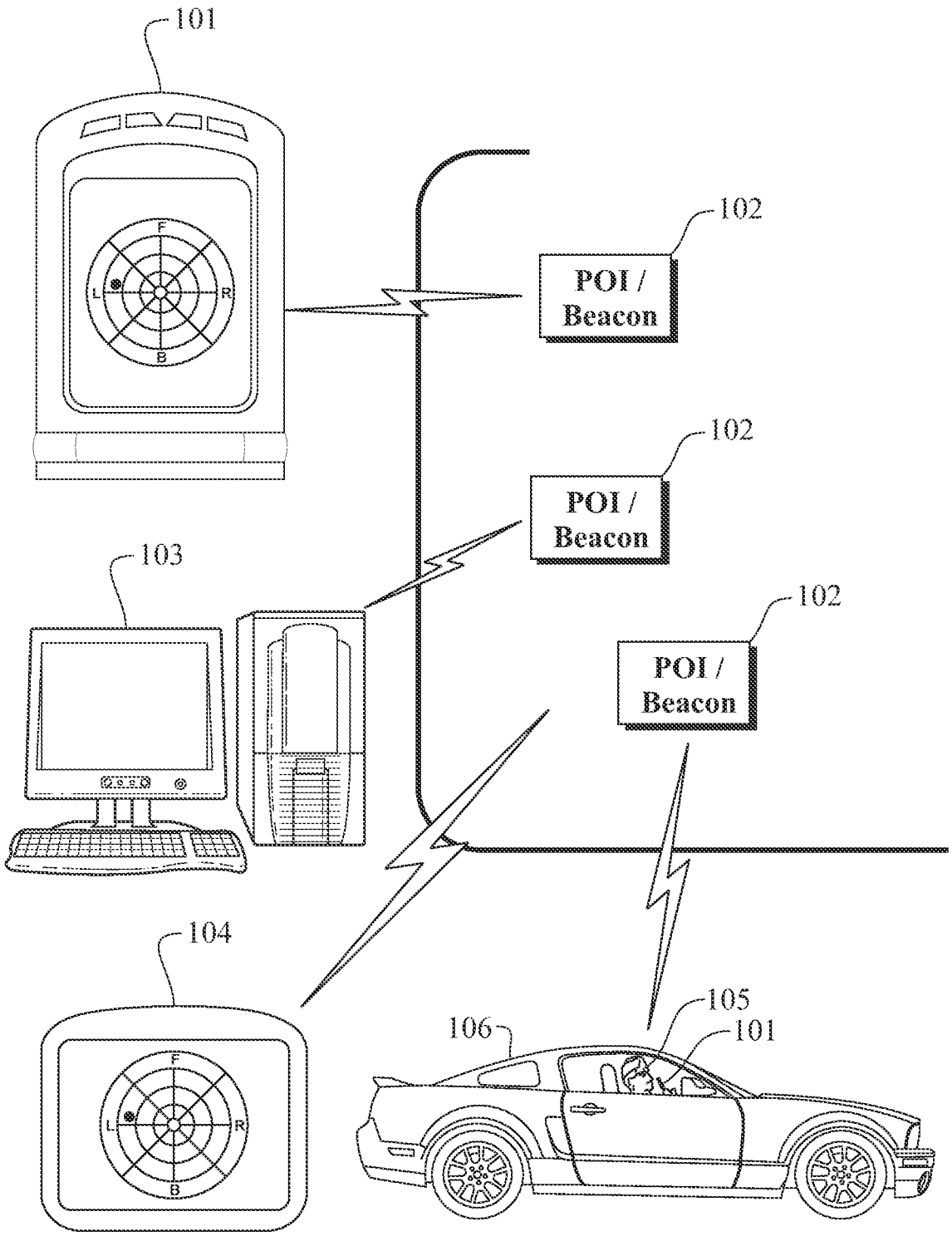

101
F
L
R
B
102
POI / Beacon
102
POI / Beacon
103
102
POI / Beacon
104
F
L
R
B
105
106
101

FIG. 1

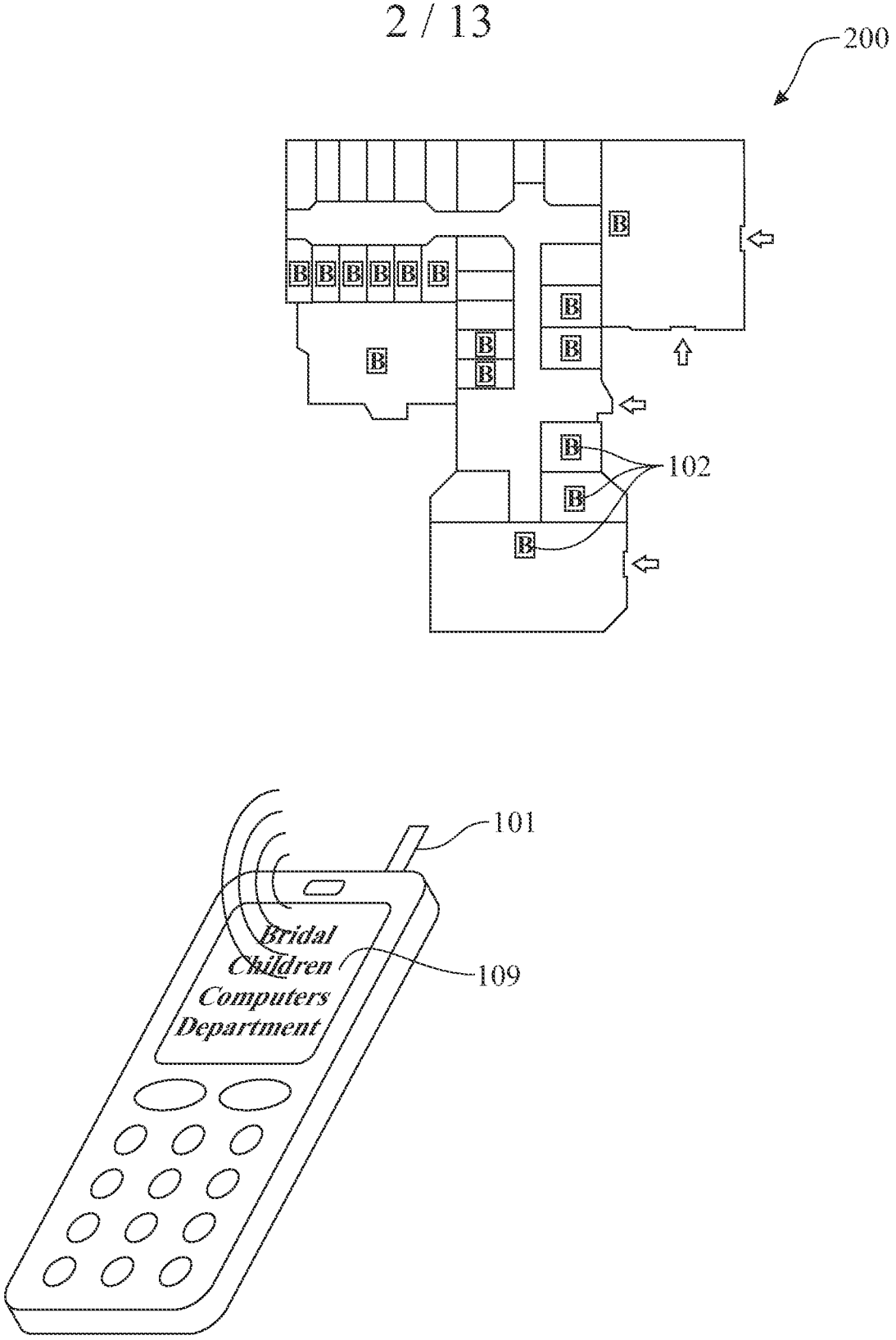


FIG. 2

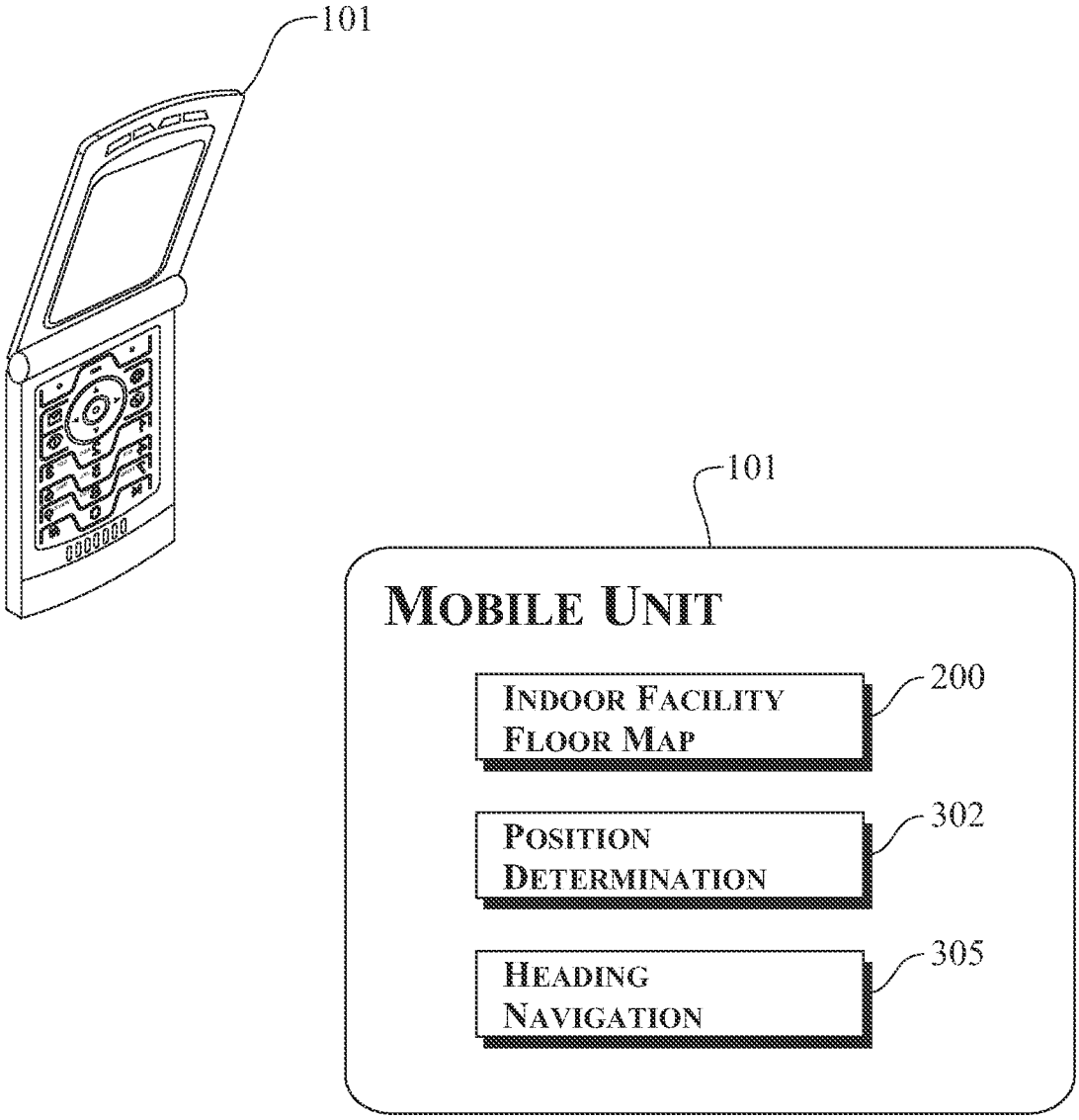

101
101
MOBILE UNIT
INDOOR FACILITY FLOOR MAP
200
POSITION DETERMINATION
302
HEADING NAVIGATION
305

FIG. 3

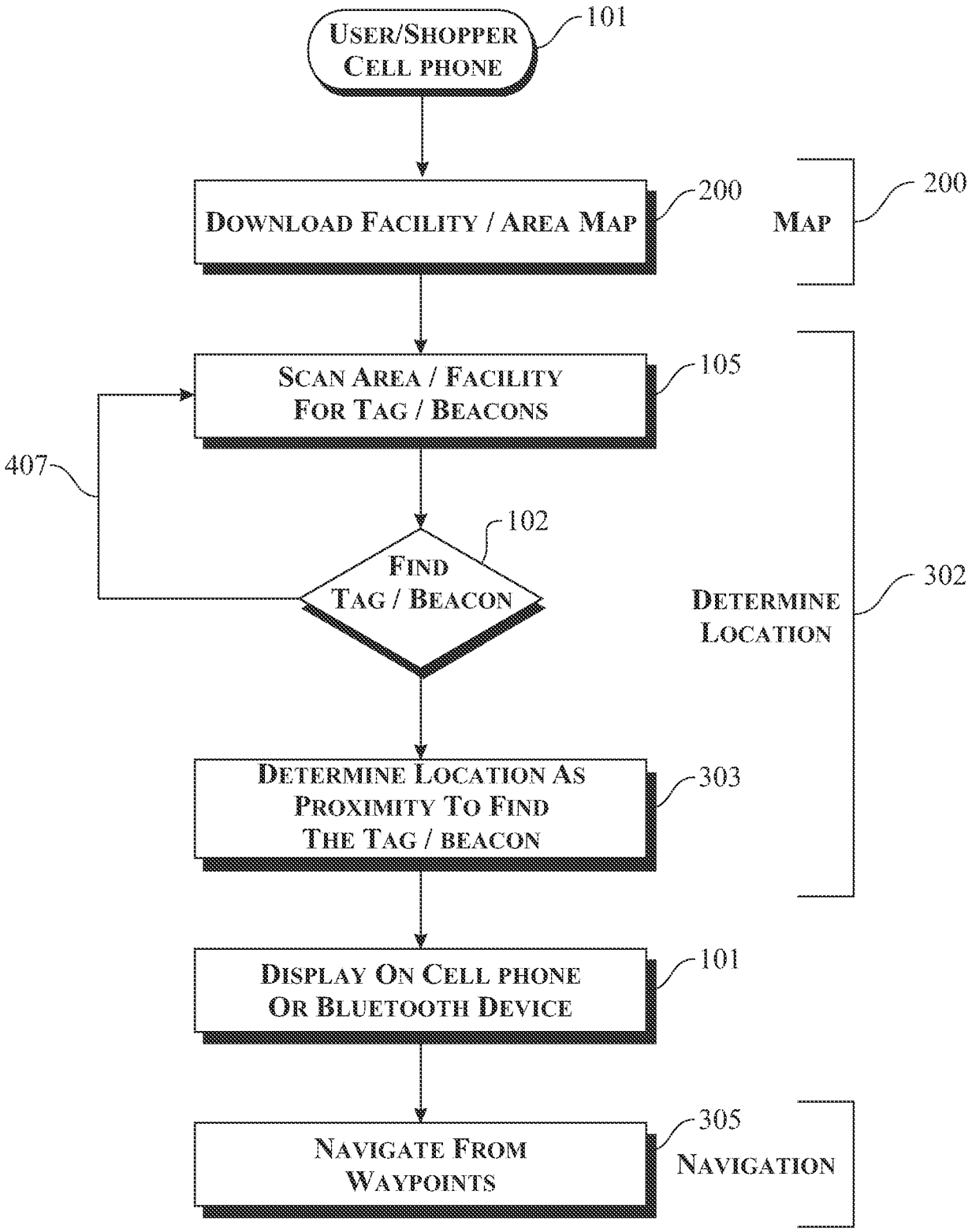

USER/SHOPPER CELL PHONE
101
DOWNLOAD FACILITY / AREA MAP
200
MAP
200
SCAN AREA / FACILITY FOR TAG / BEACONS
105
407
FIND TAG / BEACON
102
DETERMINE LOCATION
302
DETERMINE LOCATION AS PROXIMITY TO FIND THE TAG / BEACON
303
DISPLAY ON CELL PHONE OR BLUETOOTH DEVICE
101
NAVIGATE FROM WAYPOINTS
305
NAVIGATION

FIG. 4

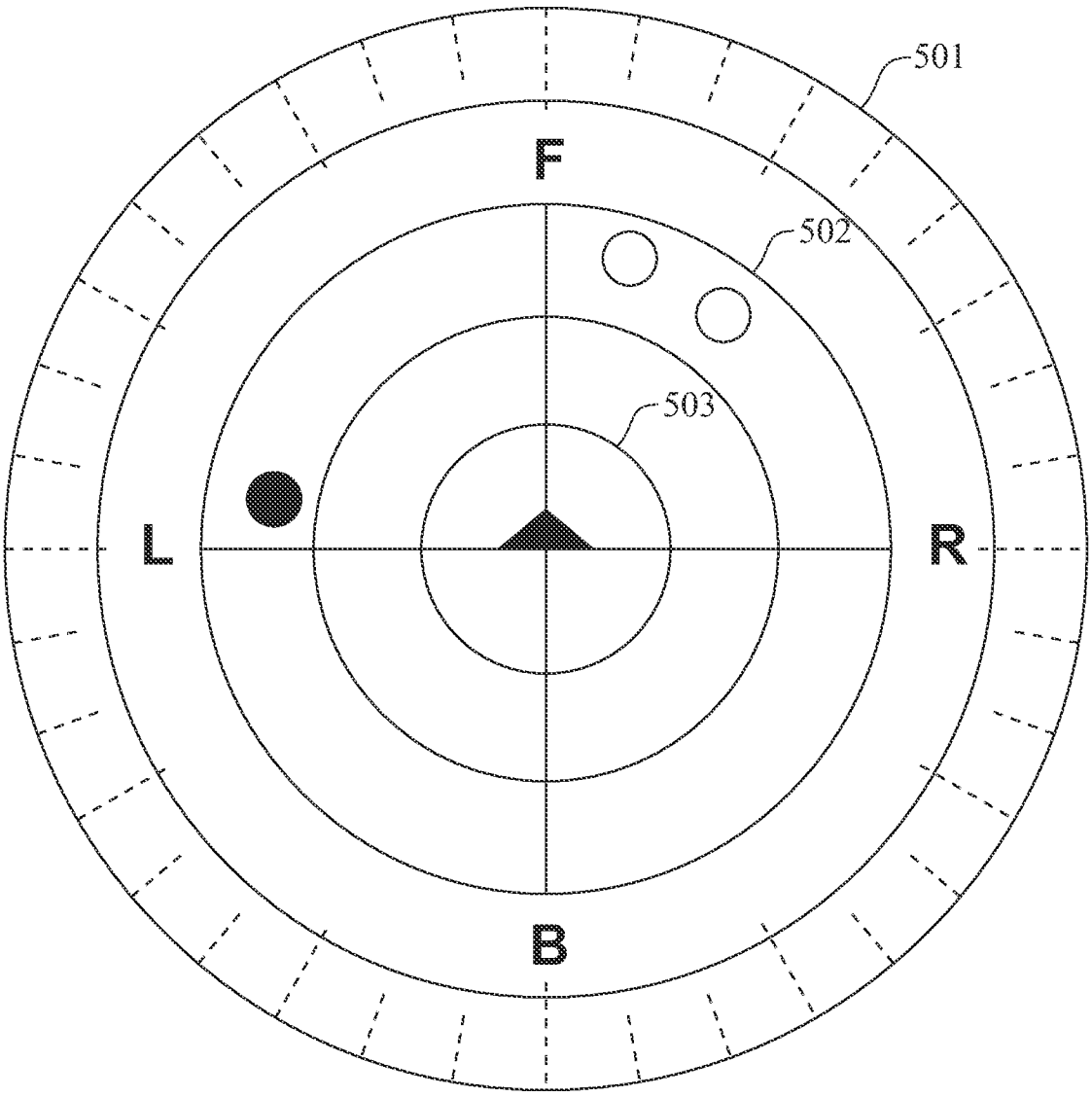


FIG. 5

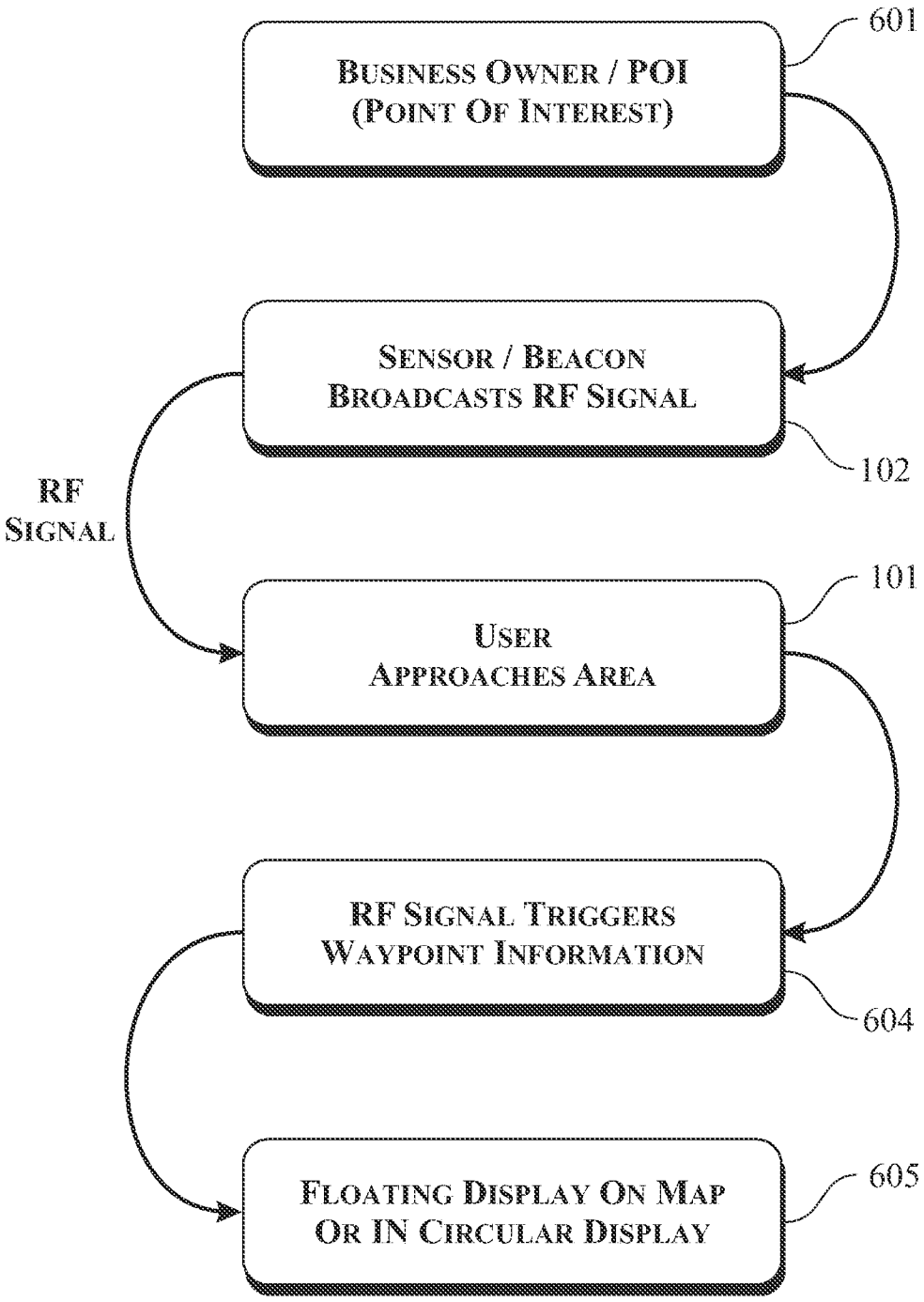

BUSINESS OWNER / POI
(POINT OF INTEREST)
601
SENSOR / BEACON
BROADCASTS RF SIGNAL
102
RF
SIGNAL
USER
APPROACHES AREA
101
RF SIGNAL TRIGGERS
WAYPOINT INFORMATION
604
FLOATING DISPLAY ON MAP
OR IN CIRCULAR DISPLAY
605

FIG. 6

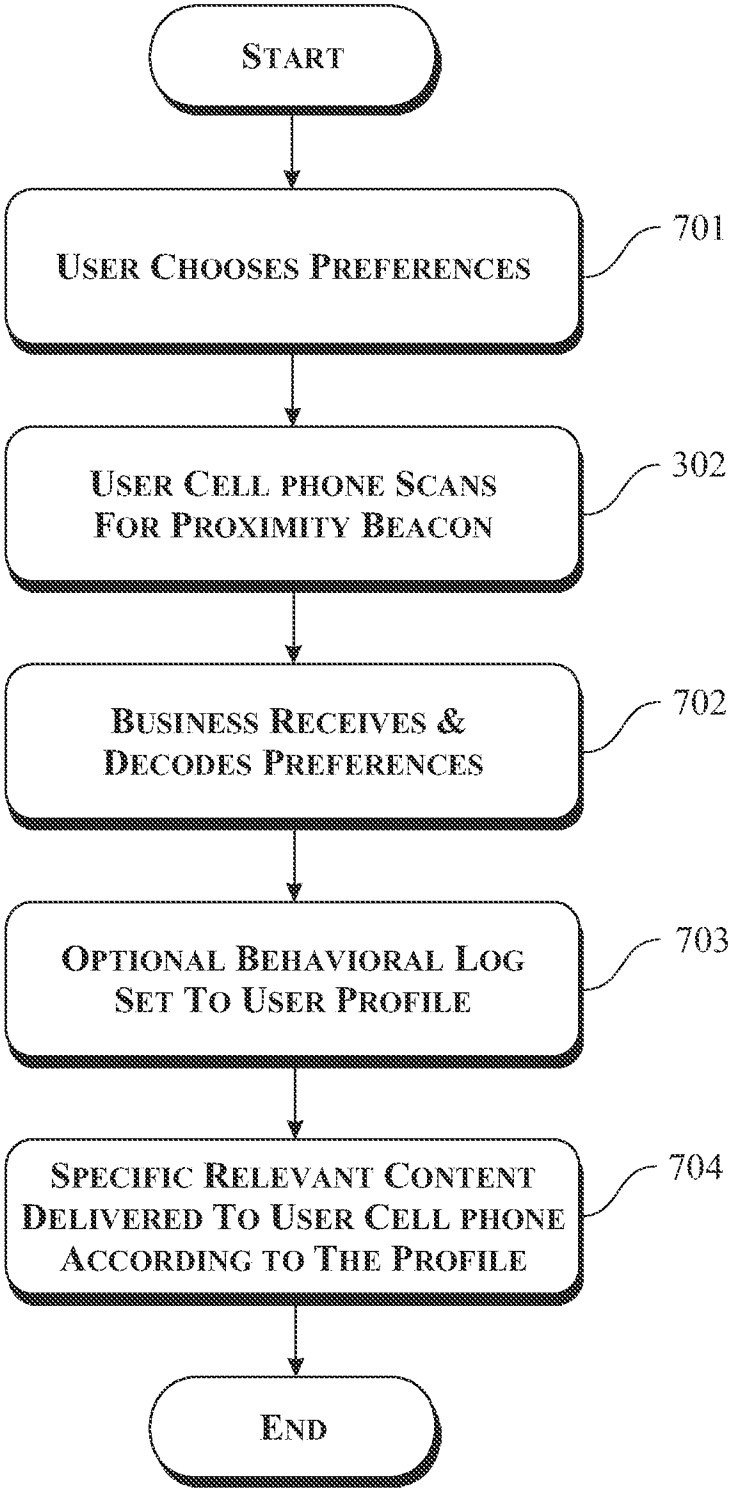

START
USER CHOOSES PREFERENCES
701
USER CELL PHONE SCANS FOR PROXIMITY BEACON
302
BUSINESS RECEIVES & DECODES PREFERENCES
702
OPTIONAL BEHAVIORAL LOG SET TO USER PROFILE
703
SPECIFIC RELEVANT CONTENT DELIVERED TO USER CELL PHONE ACCORDING TO THE PROFILE
704
END

FIG. 7

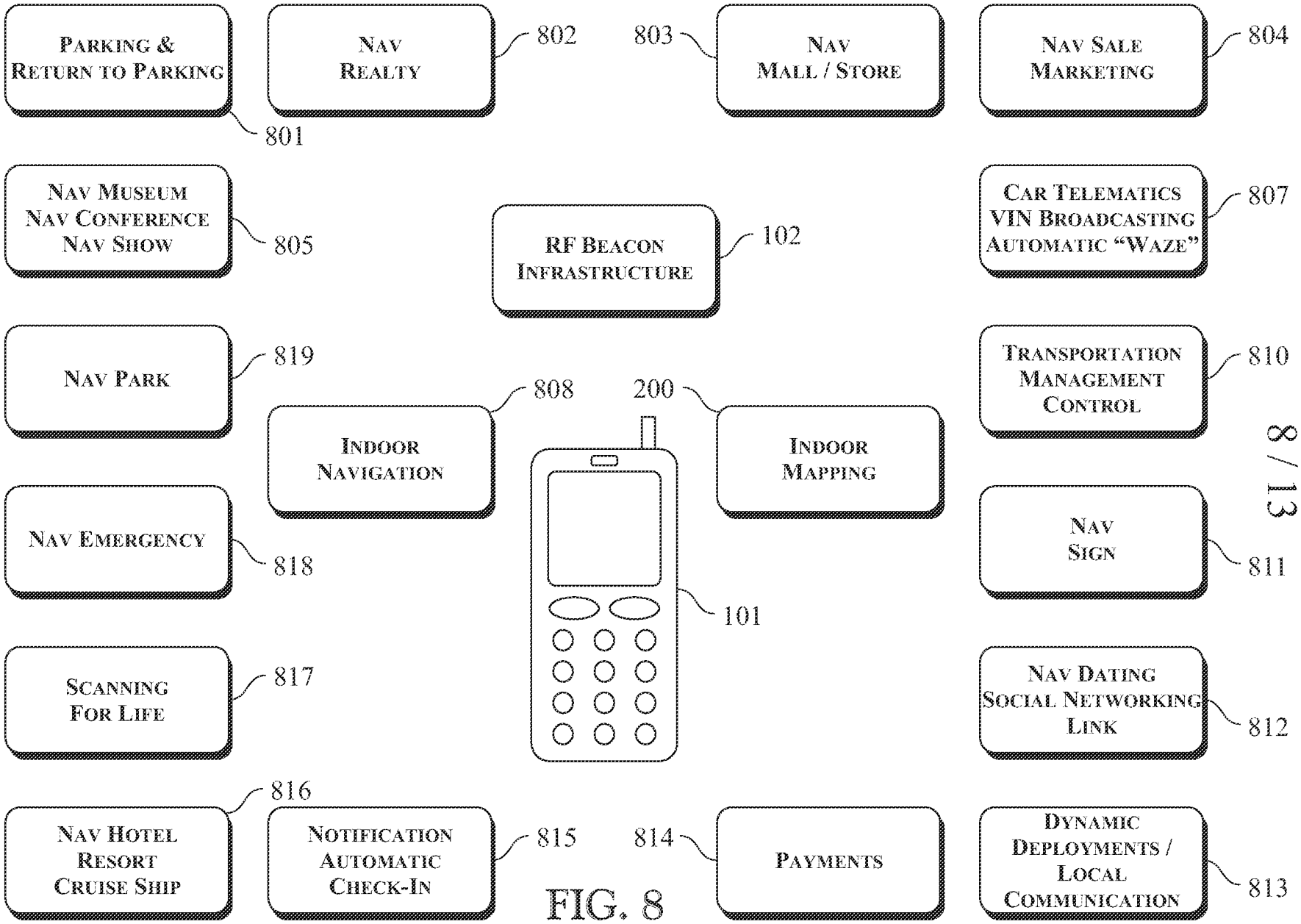


FIG. 8

8 / 13

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Atty. Docket No.: MEN-14-002

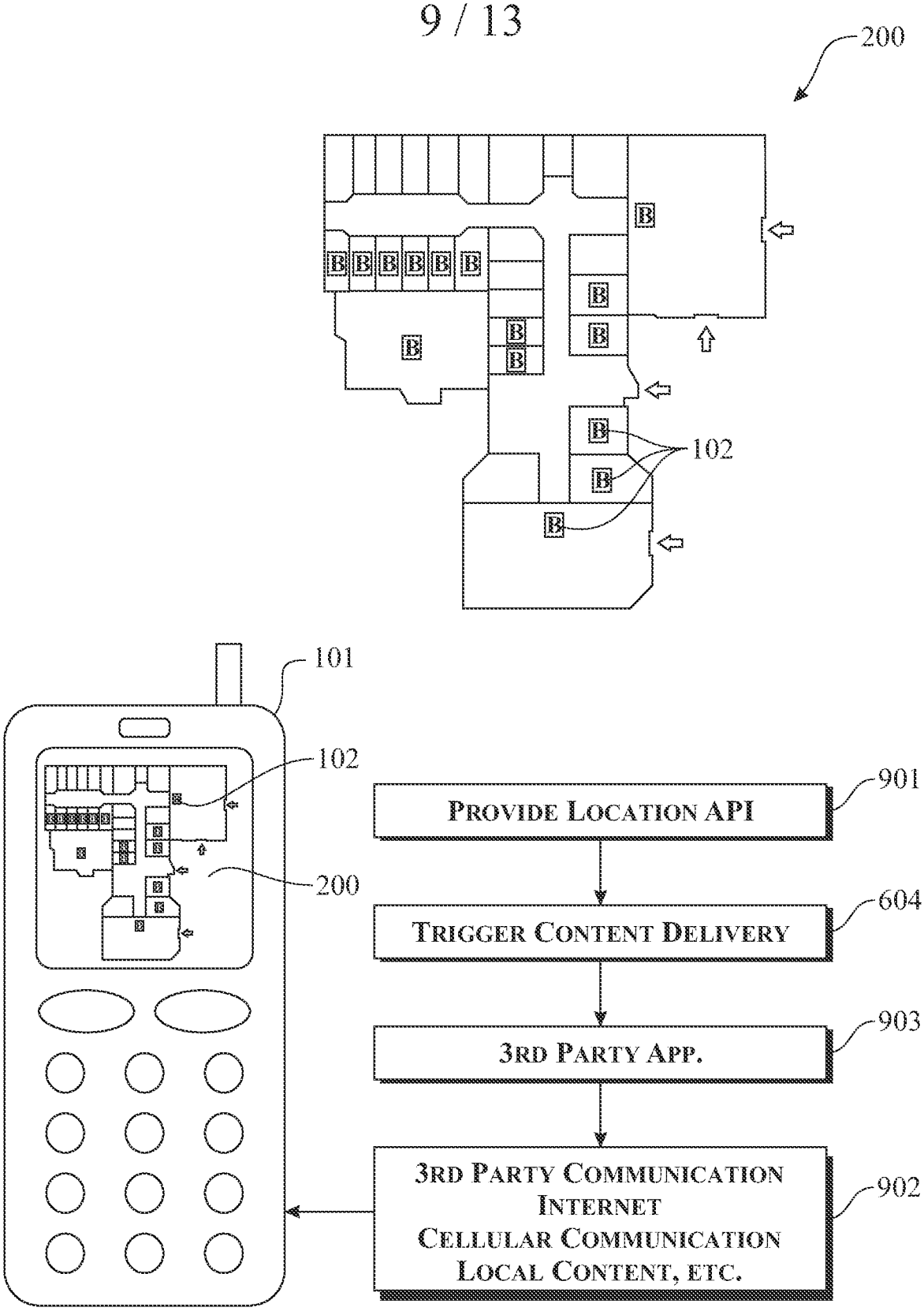

200
102
101
102
200
PROVIDE LOCATION API
901
TRIGGER CONTENT DELIVERY
604
3RD PARTY APP.
903
3RD PARTY COMMUNICATION
INTERNET
CELLULAR COMMUNICATION
LOCAL CONTENT, ETC.
902

FIG. 9

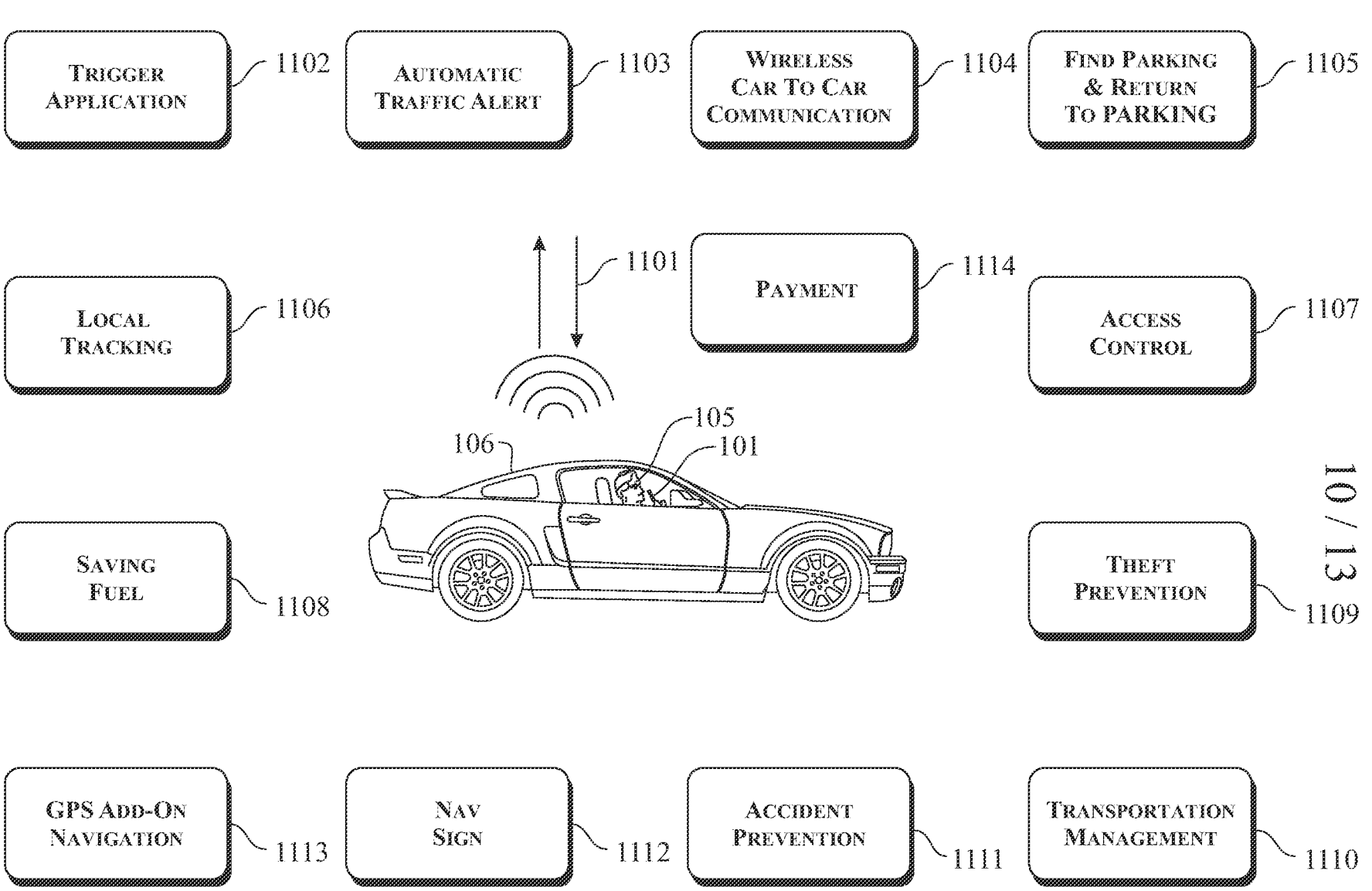


FIG. 10

Applicant: Ehud MENDELSON
Atty. Docket No.: MEN-14-002

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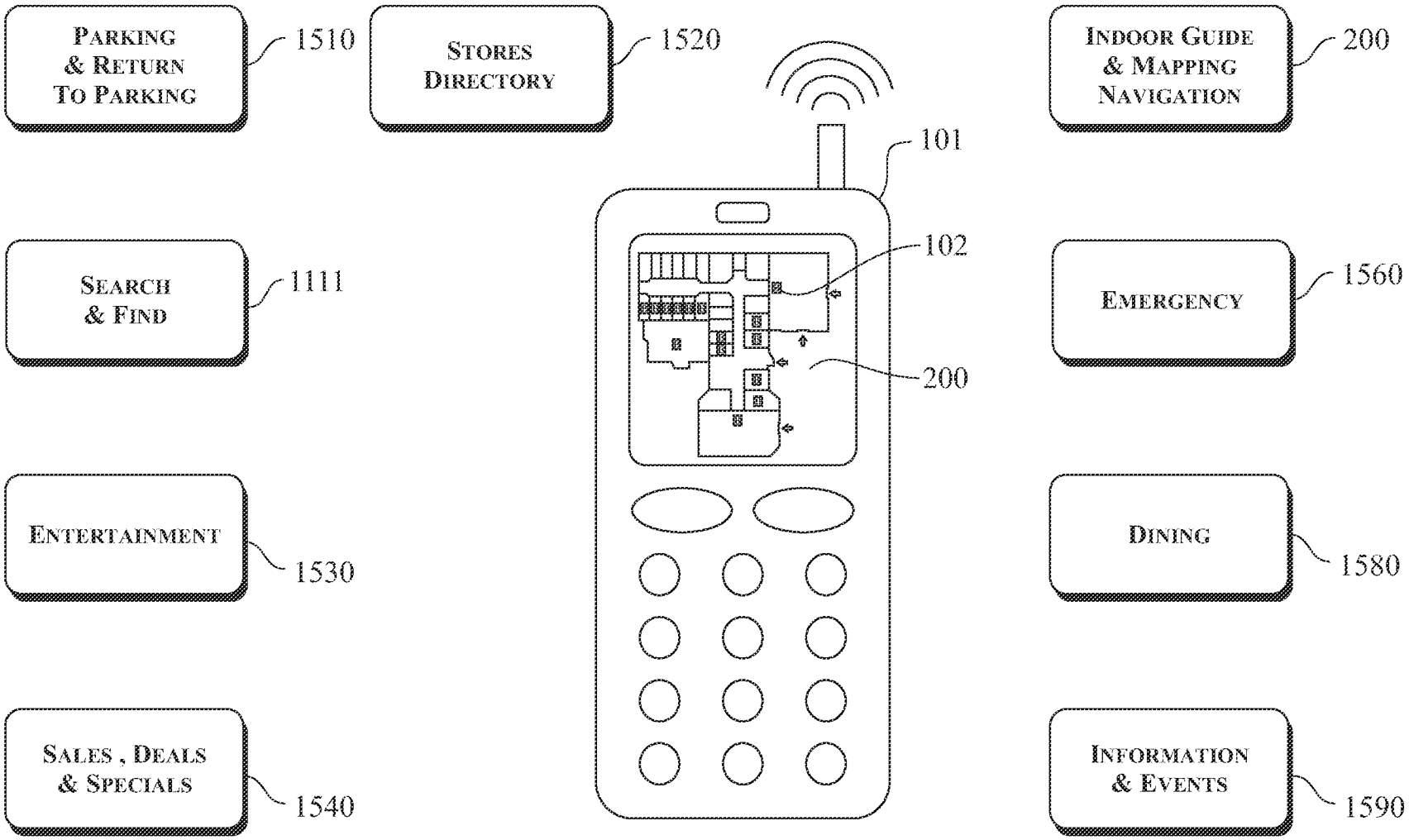

PARKING & RETURN TO PARKING
1510
STORES DIRECTORY
1520
INDOOR GUIDE & MAPPING NAVIGATION
200
101
SEARCH & FIND
1111
102
EMERGENCY
1560
200
ENTERTAINMENT
1530
DINING
1580
SALES , DEALS & SPECIALS
1540
INFORMATION & EVENTS
1590

FIG. 11

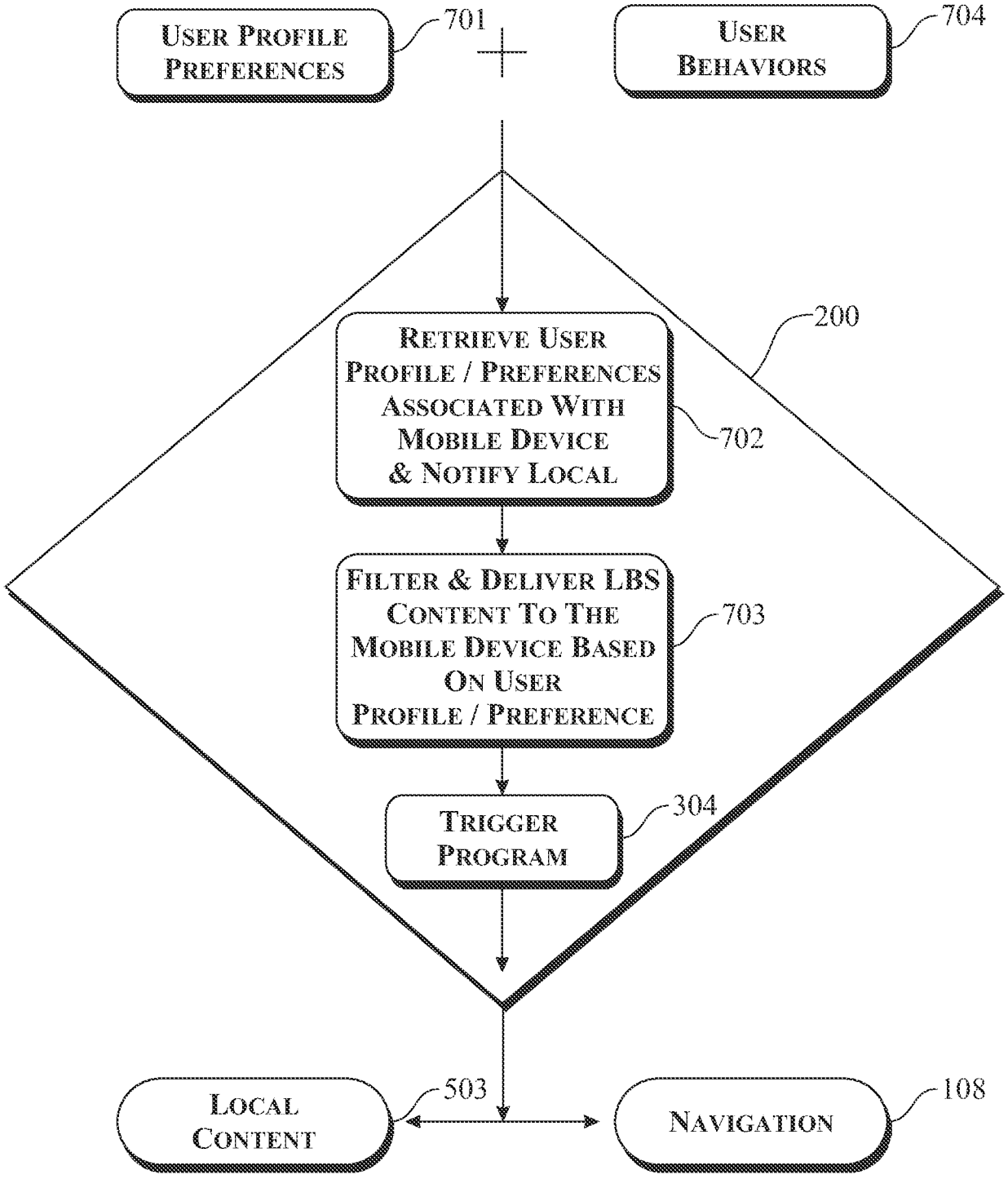

USER PROFILE PREFERENCES
701
USER BEHAVIORS
704
200
RETRIEVE USER PROFILE / PREFERENCES ASSOCIATED WITH MOBILE DEVICE & NOTIFY LOCAL
702
FILTER & DELIVER LBS CONTENT TO THE MOBILE DEVICE BASED ON USER PROFILE / PREFERENCE
703
TRIGGER PROGRAM
304
LOCAL CONTENT
503
NAVIGATION
108

FIG. 12

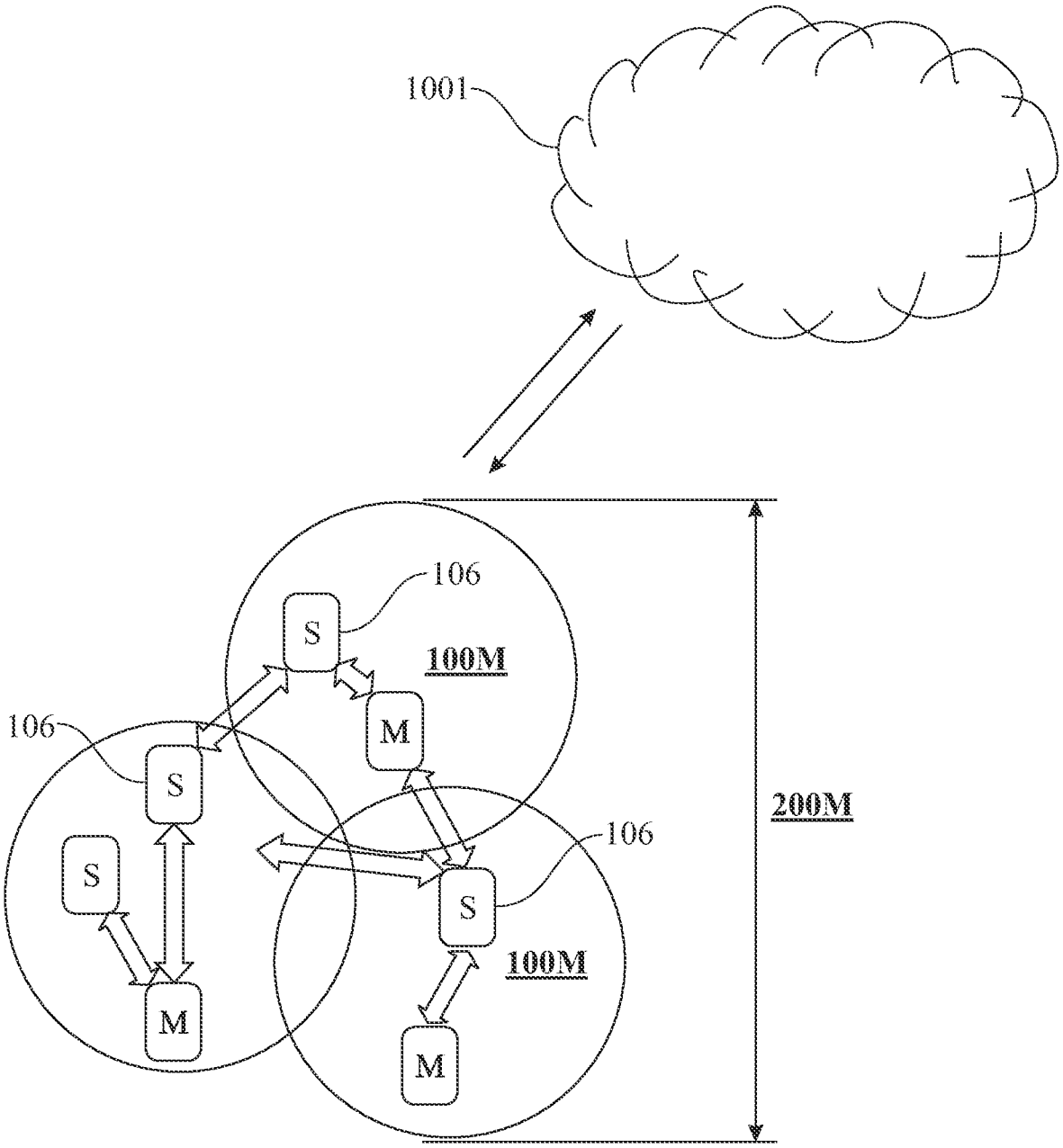


FIG. 13

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Filer:	Allen D. Hertz
Attorney Docket Number:	MEN-14-002

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Claims in excess of 20	2202	1	40	40
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**770**

Electronic Acknowledgement Receipt

EFS ID:	19108413
Application Number:	14285273
International Application Number:	
Confirmation Number:	9122
Title of Invention:	INDOOR AND OUTDOOR MAPPING AND NAVIGATION UTILIZING RF BLUETOOTH BEACONS
First Named Inventor/Applicant Name:	Ehud Mendelson
Customer Number:	31877
Filer:	Allen D. Hertz
Filer Authorized By:	
Attorney Docket Number:	MEN-14-002
Receipt Date:	22-MAY-2014
Filing Date:	
Time Stamp:	17:35:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$770
RAM confirmation Number	4139
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

Google Ex. 1029, p. 575

1		MEN-14-002_Mendelson_Mapping_DIV_Comp_052214.pdf	5547398 86fa183e955d2682ded5f345a390d583166bbcc8	yes	139

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Transmittal of New Application	1	1
Oath or Declaration filed	2	2
Application Data Sheet	3	9
Power of Attorney	10	11
Nonpublication request from applicant.	12	12
Specification	13	117
Claims	118	125
Abstract	126	126
Drawings-only black and white line drawings	127	139

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	36364 a85f460ee8586f6887de5ecfb129f60baed1b841	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5583762		

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.